Study & Evaluation Scheme

of

Bachelor of Technology
(Computer Science & Engineering)

[Applicable w.e.f. Academic Session 2011-12 till revised]

TEERTHANKER MAHAVEER UNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001
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TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)

Delhi Road, Bagarpur, Moradabad (U.P)

Study & Evaluation Scheme
of
Bachelor of Technology
SUMMARY

Programme : B. Tech (Computer Science & Engineering)

Duration : Four year full time (Eight Semesters)

Medium : English

Minimum Required Attendance : 75 %

Credit :

Maximum Credit : 254

Minimum credit required for the degree : 246

Assessment Theory :

Internal	External	Total
30	70	100

Internal Evaluation (Theory Papers)

Class Test I	Class Test II	Class Test III	Assignment(s)	Other Activity (including attendance	Total
Best two out of the three					
10	10	10	5	5	30

Evaluation of Practical/ Industrial Training/ Project :

Internal	External	Total
50	50	100

Duration of Examination :

External	Internal
3 hrs.	1 ½ hrs

To qualify the course a student is required to secure a minimum of 40% marks in aggregate including the semester end examination and teacher's continuous evaluation.(i.e. both internal and external).

A candidate who secures less than 40% of marks in a course shall be deemed to have failed in that course. The student should have at least 50% marks in aggregate to clear the semester. In case a student has secured more than 40% in each course, but less than 50% overall in a semester, he/she shall re-appear in courses where the marks are less than 50% to achieve the required aggregate percentage (of 50%) in the semester.

Question Paper Structure

1. *The question paper shall consist of eight questions. Out of which first question shall be of short answer type (not exceeding 50 words) and will be compulsory. Question No. 1 shall contain 8 parts representing all units of the syllabus and students shall have to answer any five (weightage 4 marks each).*
2. *Out of the remaining seven questions, student shall be required to attempt any five questions. There will be minimum one and maximum two questions from each unit of the syllabus. The weightage of Question No. 2 to 8 shall be 10 marks each.*

Study & Evaluation Scheme
Programme: B. Tech. (Computer Science & Engineering)
Semester I

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EAS101	Engineering Mathematics-I	3	2	-	4	30	70	100
2	EAS102	Physics	3	2	-	4	30	70	100
	EAS103	Chemistry							
3	EME101	Engineering Mechanics	3	2	-	4	30	70	100
	EME102	Manufacturing Science							
4	ECS101	Computer Basics & 'C' Programming	3	2	-	4	30	70	100
	EAS 104	Environmental Science							
5	EEE101	Basic Electrical Engineering	3	2	-	4	30	70	100
	EEC101	Basic Electronics Engineering							
6	EHM101	Foundation English-I	2	-	2	3	30	70	100
7	EAS151	Physics (Lab)	-	-	3	2	50	50	100
	EAS152	Chemistry (Lab)							
8	EME151	Engineering Mechanics(Lab)	-	-	3	2	50	50	100
	EME152	Engineering Drawing (Lab)							
9	ECS151	Computer Basics & 'C' Programming (Lab)	-	-	3	2	50	50	100
	EME153	Workshop Practice (Lab)							
10	EEE151	Basic Electrical Engineering (Lab)	-	-	3	2	50	50	100
	EEC151	Basic Electronics Engineering (Lab)							
11	EGP171	Discipline & General Proficiency	-	-	-	1	100	-	100
		Total	**17**	**10**	**14**	**32**	**480**	**620**	**1100**

Semester II

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EAS201	Engineering Mathematics-II	3	2	-	4	30	70	100
2	EAS202	Physics	3	2	-	4	30	70	100
	EAS203	Chemistry							
3	EME201	Engineering Mechanics	3	2	-	4	30	70	100
	EME202	Manufacturing Science							
4	ECS201	Computer Basics & 'C' Programming	3	2	-	4	30	70	100
	EAS204	Environmental Science							
5	EEE201	Basic Electrical Engineering	3	2	-	4	30	70	100
	EEC201	Basic Electronics Engineering							
6	EHM201	Foundation English –II	2	-	2	3	30	70	100
7	EAS251	Physics (Lab)	-	-	3	2	50	50	100
	EAS 252	Chemistry (Lab)							
8	EME251	Engineering Mechanics (Lab)	-	-	3	2	50	50	100
	EME 252	Engineering Drawing (Lab)							
9	ECS251	Computer Basics & 'C' Programming (Lab)	-	-	3	2	50	50	100

	EME 253	Workshop Practice (Lab)							
10	EEE 251	Basic Electrical Engineering (Lab)	-	-	3	2	50	50	100
	EEC 251	Basic Electronics Engineering (Lab)							
11	EGP271	Discipline & General Proficiency	-	-	-	1	100	-	100
		Total	**17**	**10**	**14**	**32**	**480**	**620**	**1100**

Semester III

S. No.	***Course Code***	***Subject***	***Periods***			***Credit***	***Evaluation Scheme***		
			L	***T***	***P***		***Internal***	***External***	***Total***
1	ECS301	Discrete Structure	3	2	-	4	30	70	100
2	ECS302	Object Oriented Programming System	3	2	-	4	30	70	100
3	ECS303	Operating System	3	2	-	4	30	70	100
4	EEC302	Digital Electronics and Computer Organization	3	2	-	4	30	70	100
5	EHM302	Organizational Behavior	3	2	-	4	30	70	100
6	EHM301	Professional Writing	2	-	2	3	30	70	100
7	ECS351	C++ Programming (Lab)	-	-	4	2	50	50	100
8	EEC351	Digital Logic & Circuit (Lab)	-	-	4	2	50	50	100
9	ECS352	UNIX & Shell Programming (Lab)	-	-	4	2	50	50	100
10	EGP371	Discipline & General Proficiency	-	-		1	100	-	100
		Total	**17**	**10**	**14**	**30**	**430**	**570**	**1000**

Semester IV

S. No.	***Course Code***	***Subject***	***Periods***			***Credit***	***Evaluation Scheme***		
			L	***T***	***P***		***Internal***	***External***	***Total***
1	ECS401	Theory of Computation	3	2	-	4	30	70	100
2	ECS402	Data Base Management System	3	2	-	4	30	70	100
3	ECS403	Data Structure using 'C'	3	2	-	4	30	70	100
4	ECS404	Software Engineering	3	2	-	4	30	70	100
5	ECS405	Computer Based Numerical & Statistical Techniques	3	2	-	4	30	70	100
6	EHM401	Technical Communication	2	-	2	3	30	70	100
7	ECS451	Data Base Management System (Lab)	-	-	4	2	50	50	100
8	ECS452	Data Structure using 'C' (Lab)	-	-	4	2	50	50	100
9	ECS453	Computer Based Numerical & Statistical Techniques (Lab)	-	-	4	2	50	50	100
10	EGP471	Discipline & General Proficiency	-	-	-	1	100	-	100
		Total	**17**	**10**	**14**	**30**	**430**	**570**	**1000**

Semester V

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	ECS501	Compiler Design and Construction	3	2	-	4	30	70	100
2	ECS502	Computer Architecture	3	2	-	4	30	70	100
3	ECS503	Analysis and Design of Algorithm	3	2	-	4	30	70	100
4	ECS504	Computer Network	3	2	-	4	30	70	100
5	EHM501	Technical Writing	2	-	2	3	30	70	100
6	EHM502	Principle of Management	3	2	-	4	30	70	100
7	ECS551	Compiler Design (Lab)	-	-	4	2	50	50	100
8	ECS552	Analysis and Design of Algorithm(Lab)	-	-	4	2	50	50	100
9	ECS553	Computer Network (Lab)	-	-	4	2	50	50	100
10	ECS591	Industrial Training	-	-	-	2	50	50	100
11	EGP571	Discipline & General Proficiency	-	-	-	1	100	-	100
		Total	**17**	**10**	**14**	**32**	**480**	**620**	**1100**

Semester VI

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	ECS601	Artificial Intelligence	3	2	-	4	30	70	100
2	ECS602	Java Programming	3	2	-	4	30	70	100
3	ECS603	Computer Graphics	3	2	-	4	30	70	100
4	ECS608	Distributed System	3	2	-	4	30	70	100
Elective I – Select any one course									
5	ECS605	E-Commerce & ERP System	3	2	-	4	30	70	100
	ECS606	Real Time Operating System							
	ECS607	Soft Computing							
	EEC606	Microprocessor & Application							
6	EHM601	Communication Technique	2	-	2	3	30	70	100
7	ECS651	Artificial Intelligence (Lab)	-	-	4	2	50	50	100
8	ECS652	Java Programming (Lab)	-	-	4	2	50	50	100
9	ECS653	Computer Graphics (Lab)	-	-	4	2	50	50	100
11	EGP671	Discipline & General Proficiency	-	-	-	1	100	-	100
		Total	**17**	**10**	**14**	**30**	**430**	**570**	**1000**

Semester VII

S. No.	*Course Code*	*Subject*	*Periods*			*Credit*	*Evaluation Scheme*		
			L	*T*	*P*		*Internal*	*External*	*Total*
1	ECS701	Cloud Computing	3	2	-	4	30	70	100
2	ECS702	Linux Internals	3	2	-	4	30	70	100
3	ECS703	Software Testing	3	2	-	4	30	70	100
4	EHM701	Corporate Communication	2	-	2	3	30	70	100
Lab									
5	ECS751	Cloud Computing(Lab)	-	-	4	2	50	50	100
6	ECS752	Linux(Lab)	-	-	4	2	50	50	100
Elective I# – Select any one course									
7	ECS704	Digital Image Processing	3	2	-	4	30	70	100
	ECS705	Management Information System							
Elective I# - Lab – Same as one selected from column above									
8	ECS753	Digital Image Processing (Lab)	-	-	4	2	50	50	100
	ECS754	Management Information System (Lab)							
9	**Elective II – Select any one course**								
	ECS706	Advance Computer Network	3	2	-	4	30	70	100
	ECS707	Information Storage and Retrieval							
	ECS708	Cryptography and Network Security							
10	ECS791	Industrial Training & Presentation			-	4	50	50	100
11	EGP771	Discipline & General Proficiency	-	-	-	1	100	-	100
		Total	**17**	**10**	**14**	**34**	**480**	**620**	**1100**

#the student has to opt the respective Lab of elective subject.

Semester VIII

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	ECS801	Web Technology (Design and Architecture using. NET)	3	2	-	4	30	70	100
2	ECS802	Mobile Computing	3	2	-	4	30	70	100
3	ECS803	Multimedia and Animation	3	2	-	4	30	70	100
4	EHM801	Industrial Sociology & Professional Ethics	2	2	-	3	50	50	100
Lab									
5	ECS851	Web Technology (Lab)	-	-	4	2	50	50	100
Elective I# – Select any one course									
7	EEC807	Embedded System	3	2	-	4	30	70	100
	ECS804	Data Warehousing and Data Mining							
Elective I Lab# – Select any one course									
8	EEC855	Embedded System (Lab)	-	-	4	2	50	50	100
	ECS852	Data Warehousing and Data Mining (Lab)							
Elective II – Select any one course									
9	ECS805	Simulation and Modeling	3	2	-	4	30	70	100
	ECS806	Natural Language Processing							
10	ECS899	Project Work	-	-	6	6	50	50	100
11	EGP871	Discipline & General Proficiency	-	-	-	1	100	-	100
		Total	**17**	**12**	**14**	**34**	**430**	**570**	**1000**

#The student has to opt the respective Lab of elective subject.

Semester I

ENGINEERING MATHEMATICS-I

Course Code: EAS101	L	T	P	C
	3	2	0	4

Objective:

- To familiarize the basic of matrix, Differential Calculus, Multiple Integrals, and Vector Calculus.
- To solve all problems related to matrix, calculus, and vectors.

Course Contents

Unit I

Matrices: Elementary row and column trans formation, Rank of matrix, Linear dependence, Consistency of linear system of equations, Characteristic equation, Caley- Hamilton Theorem, Eigen values and Eigen vectors, Diagonalisation, Complex and unitary matrices. **(Lectures 08)**

Unit II

Differential Calculus-I: Leibnitz theorem, Partial differentiation, Euler's theorem, Curve tracing, Change of variables, Expansion of function of several variables **(Lectures 08)**

Unit III

Differential Calculus–II: Jacobian, Approximation of errors, Extrema of functions of several variables, Lagrange's method of multipliers (Simple applications). **(Lectures 08)**

Unit IV

Multiple Integrals: Double and triple integral, Change of order, Change of variables, Beta and Gamma functions, Application to area, volume, Dirichlet integral and applications.

(Lectures 08)

Unit V

Vector Calculus: Point functions, Gradient, divergence and curl of a vector and their physical interpretations, Line, Surface and Volume integrals, Greens, Stokes and Gauss divergence theorem. **(Lectures 08)**

Text Books

1. Grewal B.S., *Higher Engineering Mathematics*, Khanna Publishers.
2. Prasad C., *Engineering Mathematics for Engineers*, Prasad Mudralaya
3. Das H.K., Engineering Mathematics Vol-I, S. Chand, New Delhi

Reference Books

1. Kreyszig E., *Advanced Engineering Mathematics*, Wiley Eastern
2. Piskunov N, *Differential & Integral Calculus*, Moscow Peace Publishers.
3. Narayan Shanti, *A Text book of Matrices*, S. Chand
4. Bali N.P., Engineering Mathematics-I.

*** Latest editions of all the suggested books are recommended.**

Semester I/II
PHYSICS

Course Code: EAS102/EAS 202	L	T	P	C
	3	2	0	4

Objective:

- To understand the fundamentals of physics like interference, diffraction, lasers etc.

Course Contents

Unit I

Relativistic Mechanics: Inertial and Non- inertial Frames, Michelson-Morley Experiment, Postulates of Special Theory of Relativity, Galilean and Lorentz Transformation, Length Contraction and Time Dilation, Addition of Velocities, Mass Energy Equivalence and Variation of Mass with Velocity. **(Lectures 08)**

Unit II

Interference: Coherent Sources, Conditions of Interference, Fresnel's Biprism Experiment, Displacement of Fringes, Interference in Thin Films, Wedge Shaped Film, Newton's Rings.

Diffraction: Single and N-Slit Diffraction, Diffraction Grating, Rayleigh's criterion of resolution, Resolving Power of Telescope, Microscope and Grating. **(Lectures 08)**

Unit III

Polarization: Phenomenon of Double Refraction, Ordinary and Extra-ordinary Rays, Nicol Prism, Production and Analysis of Plane, Circularly and Elliptically Polarized Light, Fresnel Theory, Optical Activity, Specific Rotation, Polari meter.

Laser: Principle of Laser Action, Einstein's Coefficients, Construction and Working of He-Ne and Ruby Laser. **(Lectures 08)**

Unit IV

Electromagnetic: Ampere's Law and Displacement Current, Maxwell's Equations in Integral and Differential Forms, Electromagnetic Wave Propagation in Free Space and Conducting Media, Poynting Theorem. **(Lectures 08)**

Unit V

Magnetic Properties of Materials: Basic Concept of Para, Dia and Ferro-Magnetism, Langevin's Theory of Diamagnetism, Phenomenon of Hysteresis and Its Applications

X-Rays: Diffraction of X-Rays, Bragg's Law, Practical Applications of X-Rays, Compton Effect **(Lectures 08)**

Text Books

1. Malik K. H., Engineering Physics, TMH
2. Subramanyam N, Optics, TMH
3. Vasudeva A S, Engineering Physics, Vol I & II S. Chand.

Reference Book

1. Gupta S. K., Engineering Physics, Krishna Prakashan.
2. Yadav V. S., Engineering Physics, TMH.
3. Mehta Neeraj, Engineering Physics Vol. I & II, PHI

*** Latest editions of all the suggested books are recommended.**

Semester I/II
CHEMISTRY

Course Code: EAS103/EAS203	L	T	P	C
	3	2	0	4

Objective:

- To understand the fundamentals of chemistry like Bonding, Pollution, Polymers, Water Chemistry, etc.

Course Contents

Unit I

Molecular theory of diatomic hetero-molecules, Band theory of bonding in metals, Hydrogen bonding.

Solid state Chemistry: Radius Ratio Rule, Space lattice (only cubes), Type of unit cell, Bragg's Law, Calculation of Density of unit cell. One & Two Dimensional solids, graphite as two dimensional solid and its conducting properties. Fullerene & its applications.

(Lectures 08)

Unit II

Introduction of Polymers: Structures of the following polymers, viz., Natural and synthetic rubbers, Polyamide and Polyester fibres, polymethylmethacrylate, poly acrylonitrile and polystyrene. A brief account of conducting polymers (polypyrrole & polytriphene) & their applications. Order & Molecularity of reactions. First & Second order reactions. Energy of activation. Phase Rule: Its application to one component system (Water). Equilibrium Potential, Introduction of electrochemical cells & Types: Galvanic & Concentration cells, Electrochemical theory of corrosion & protection of corrosion. **(Lectures 08)**

Unit III

Water Chemistry: Hardness of water, softening of water by Lime Soda Process & Reverse osmosis. Treatment of boiler feed water by Calgon process, Zeolites and ion-exchange resins. Classification of fuels, Coal, Biomass & Biogas. Determination of gross and net calorific values using Bomb Calorimeter. **(Lectures 08)**

Unit IV

Environmental pollution: Types of pollution & pollutants, Air Pollution. Formation and depletion of ozone, smog and Acid rain.

Toxic chemicals in Environment: Basic concepts, Brief idea about the environmental impact of toxic chemicals specially, CO, NxOx, SOx, O_3, Pesticides, Environmental Management

(Lectures 08)

Unit V

Lubricants: Introduction to lubricants, Mechanism of lubrication, Classification of lubricants, Flash and fire points, Selection of lubricants. **(Lectures 08)**

Text Books

1. Agarwal R. K., Engineering Chemistry, Krishna Prakashan.
2. Morrison & Boy, *Organic Chemistry*
3. Lee I.D., *Inorganic Chemistry*
4. Chawla Shashi, Engineering Chemistry, Dhanpat Rai Publication.

Reference Books

1. Barrow, *Physical Chemistry*
2. Manahan, *Environmental Chemistry*

*** Latest editions of all the suggested books are recommended.**

Semester I/II
ENGINEERING MECHANICS

Course Code: EME101/EME201	L	T	P	C
	3	2	0	4

Objective:

- To study about mechanics, force system, torsion, beams, trusses, frames etc.

Course Contents

Unit I

Force system and Analysis: Basic concept: Laws of motion. Transfer of force to parallel position. Resultant of planer force system. Free Body Diagrams, Equilibrium and its equation.

Friction: Introduction, Laws of Coulomb, friction, Equilibrium of bodies involving dry fiction-Belt Friction. **(Lectures 08)**

Unit II

Structure Analysis: Beams; Introduction, Shear force and Bending Moment, shear force and Bending Moment Diagram for statically determinate beams.

Trusses: Introduction, Simple Trusses, Determination of Forces in simple trusses members, methods of joints and method of section. **(Lectures 08)**

Unit III

Centroid and Moment of Inertia:

Centroid of plane, curve, area, volume and composite bodies, Moment of inertia of plane area, Parallel Axes Theorem, Perpendicular axes theorems, Principal Moment Inertia, Mass Moment of Inertia of Circular Ring, Disc, Cylinder, Sphere and Cone about their Axis of Symmetry.

(**Lectures 08)**

Unit IV

Stress and Strain Analysis: Simple stress and strain; Introduction, Normal shear stresses, stress-strain diagrams for ductile and brittle materials, Elastic constants, one dimensional loading of members of varying cross sections. **(Lectures 08)**

Unit V

Pure Bending of Beams: Introduction, Simple Bending theory, Stress in Beams of different cross sections.

Torsion: Introduction, Torsion of Shafts of circular section, Torque and Twist, Shear stress due to Torque. **(Lectures 08)**

Text Books

1. Bansal R. K., *Engineering Mechanics,* Laxmi Publications
2. Kumar D. S., *Engineering Mechanic,*
3. Kumar K. L., Kumar V., *Engineering Mechanics,* Tata McGraw Hill Publication
4. Khurmi R. S., *Engineering Mechanics,* S. Chand Publications

Reference Books

1. Shames, *Engineering Mechanics,* Prentice Hall of India Pvt. Ltd.
2. Ryder G. H., *Strength of Materials,* MACMILLAN Publishers India Ltd.
3. Ramamrutham s., *Strength of materials,* Dhanpat Rai Publications

*** Latest editions of all the suggested books are recommended.**

Semester I/II
MANUFACTURING SCIENCE

Course Code: EME102/EME202	L	T	P	C
	3	2	0	4

Objective:

- To create awareness among students about manufacturing process like casting, metal forming, welding etc.

Course Contents

Unit I

Basic Metals & Alloys: Properties and Applications, Properties of Materials: Strength, elasticity, stiffness, malleability, ductility, brittleness, toughness, and hardness. Elementary ideas of fracture fatigue & creep. **(Lectures 08)**

Unit II

Introduction to Metal Forming & Casting Process and its applications.

Metal Forming: basic metal forming operations & uses of such as: Forgoing, Rolling, Wire & Tube-drawing/making and Extrusion, and its products/application. Press-work, die & punch assembly, cutting and forming, its application. Hot-working versus cold-working.

Casting: Pattern & allowance. Molding sands its desirable properties. Mould making with the use of core. Gating system, Casting defects & remedies. Cupola Furnace, Die-casting and its uses.

(Lectures 08)

Unit III

Introduction to machining & Welding and its applications.

Machining: basic principles of Lathe-machine and operations performed on it. Basic description of machines and operations of Shaper-Planner, Drilling, Milling & Grinding.

Welding: Importance & basic concepts of welding, classification of welding processes, Gas-welding, types of flames. Electric-Arc welding. Resistance welding, Soldering, & Brazing and its uses.

(Lectures 08)

Unit IV

Introduction & Orthographic Projection: Graphics as a tool to communicate ideas, Lettering and Dimensioning, Construction of geometrical figures like pentagon and hexagon. Principles of orthographic projections, Principal and auxiliary planes, first and third angle projections. Projection of points, Lines and solids. **(Lectures 08)**

Unit V

Principles of isometric projection, Isometric projection using box and offset methods.

(Lectures 08)

Text Books

1. Hajra & Bose, *Workshop Technology, Vol 1 & 2*, Roy Media Promoters
2. Bhatt, N.D., *Elementary Engineering Drawing*, Charothar Publishing

Reference Books

1. Raghuvanshi, B.S., *Workshop Technology, Vol 1 & 2*, Dhanpat Rai & Sons
2. Laxmi Narayan & Vaish W, *A Text Book of Practical Geometrical Drawing*

*** Latest editions of all the suggested books are recommended.**

Semester I/II

COMPUTER BASICS & 'C' PROGRAMMING

Course Code: ECS101/ECS201	L	T	P	C
	3	2	0	4

Objective:

- To know the basics of computers & C programming language.

Course Contents:

Unit I

Concepts in Computer Application: Definition of Electronic Computer, History, Generations, Characteristics and Application of Computers, Classification of Computers, Functional Component of Computer: CPU, I/O devices, Type of Memory & Memory Hierarchy, Firmware and Human ware.

Data and data types: definitions, data, data types: Integer, Character, Float, String, etc., Constants and Variable Declaration, Token, Keyboard, Identifier. **(Lectures 08)**

Unit II

Programming Language Classification & Computer Languages: Generation of Languages, Introduction to 4GLs. Translators: Assemblers, Compilers, Interpreters. Number System: Decimal, Octal, Binary and Hexadecimal &their Conversions. Various Code: BCD, ASCII and EBCDIC and Gray Code.

Operators and Expressions: Using numeric and relation operator, logical operator, bit operator, operator precedence and associativity. **(Lectures 08)**

Unit III

Internet and Web Technologies: Hypertext Markup Language, WWW, Gopher, FTP, Telnet, Web Browsers, Search Engines, Email.

Control Structure: while statement, if, else, Nested if else statement. Nested logic: for loop, do- while loop, loop inside a loop structure, Switch Statement. Use of break and default with switch.

(Lectures 08)

Unit IV

Concepts in Operating System: Elementary Concepts in Operating System, textual Vs GUI Interface.

Arrays: notation and representation, manipulating array elements, using multidimensional arrays.

(Lectures 08)

Unit V

Functions & Strings: definition, declaration, Call by Value, Call by Reference, returns values and their types. Function calls. **(Lectures 08)**

Text Books

1. Sinha P. K., Computer Fundamental
2. Yadav, DS, Foundations of IT, New Age, Delhi
3. Curtin, Information Technology: Breaking News, Tata Mc Graw Hill
4. Rajaraman, Introduction to Computers, Prentice-Hall India

Reference Books

1. Peter Nortans, Introduction to Computers, TME
2. Leon & Leon, Fundamental of Information Technology, Vikas Publishing
3. Kanter, Managing Information System,
4. CISTems, Internet: An Introduction, Tata McGraw Hill.

*** Latest editions of all the suggested books are recommended.**

Semester I/II
ENVIRONMENTAL SCIENCE

Course Code: EAS104/EAS204

L	T	P	C
3	2	0	4

Objective:

- To create awareness among students about environment protection.

Unit I

General: Definition, Scope, Segments of Environment and its Multidisciplinary Nature, Some Major Environmental Problems, Definition and Scope of Ecology. **(Lectures 08)**

Unit II

Ecology And Environment: Concept of an Ecosystem- its components and functions, Trophic Levels- Producer, Consumer and Decomposer, Energy Flow in an Ecosystem, Biogeochemical Cycles, Food Chain, Food Web and Ecological Pyramid. **(Lectures 08)**

Unit III

Air pollution: Various segments of Atmosphere and their Significance, Sources and Effects of Air Pollution, Classification of Air Pollutants, Stationary and Mobile Sources of Air Pollution, Photochemical Smog, Acid Rain, Global Warming (Greenhouse Effect), Ozone Layer - Its Depletion and Control Measures, El-Nino. **(Lectures 08)**

Unit IV

Water pollution: Water Resources of the Earth and Indian Scenario, Point and non-Point sources of Water Pollution, Treatment of Water Pollution, Eutrophication,
Bio-Diversity- Hot Spots of Biodiversity in India and World, Conservation, Importance and Factors Responsible for Loss of Biodiversity, Deforestation- causes and effects, Biogeographical Classification of India. **(Lectures 08)**

Unit V

Soil pollution:-Sources and Consequences, Noise, Thermal - sources and consequences, Sustainable Development, Dams and Reservoirs- Their Benefits and Problems, Solid Wastes - Pollution, Treatment & Disposal, Environment Conservation Movement in India (Chipko Movement, Appiko Movement), Bioremediation, Biological Magnification. **(Lectures 08)**

Text Books

1. De A.K., *Environmental Chemistry*, New Age Publishers Pvt. Ltd.
2. Masters, G.M., *Introduction to Environmental Engineering and Science*, Prentice Hall India Pvt. Ltd.
3. Odum, E.P., *Fundamentals of Ecology*, W. B. Sannders Co.

Reference Books

1. Bryant,P.J., *Biodiversity and Conservation*, Hypertext Book
2. Tewari, Khulbe & Tewari, *Textbook of Environment Studies*, I.K. Publication
3. Trivedi, R.K., *Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II*, Environment Media

*** Latest editions of all the suggested books are recommended.**

Semester I/II
BASIC ELECTRICAL ENGINEERING

Course Code: EEE101/EEE201

L	T	P	C
3	2	0	4

Objective

- To understand the fundamental concept of Electrical Engineering like DC Network, AC Network, Measuring Instruments, Energy Conversion Devices etc.

Course Contents

Unit I

D.C. Network Theory: Circuit theory concepts-Mesh and node analysis. Network Theorems- Super-position theorem. Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, Star Delta transformation. **(Lectures 08)**

Unit II

Steady State Analysis of A.C. Circuits: Sinusoidal and phasor representation of voltage and current: single phase A.C. circuit behaviour of resistance, inductance and capacitance and their combination in series & parallel and power factor, series parallel resonance-band width and quality factor: magnetic circuit. **(Lectures 08)**

Unit III

Measuring Instruments: Construction and principles of operation of voltage and current measuring instruments; introduction to power and energy meters.

Three Phase A.C. Circuits: Star-Delta connections, line and phase voltage/current relations, three phase power and its measurement. **(Lectures 08)**

Unit IV

Transformer: Principles of operation, types of construction, phasor diagram, equivalent circuit, efficiency and voltage regulation of single phase transformer, O.C. and S.C. tests.

D.C. Machines: Principles of electromechanical energy conversion, types of D.C. machines, E.M.F. equation, Magnetization and load characteristics, losses and efficiency, Starter and speed control of D.C. Motors, their applications. **(Lectures 08)**

Unit V

Three phase induction Motor: Principle of operation, types and methods of starting, slip-torque characteristics, applications.

Synchronous Machines: Principle of Operation of Alternator and synchronous motor

Single phase Motors: Principle of operation and methods of starting of induction motor,

(Lectures 08)

Text Books

1. V. Del Toro, *Principles of Electrical Engineering*, Prentice-Hall International.
2. W.H. Hayt & J.E. Kemmerly, *Engineering Circuit Analysis*, McGraw Hill.

Reference Books

1. Nagrath I.J., *Basic Electrical Engineering*, Tata McGraw Hill.
2. Fitgerald A.E., D.E., Higginbotham and A Grabel, *Basic Electrical Engineering*, McGraw Hill.
3. Cotton H., *Advanced Electrical Technology*, Wheeler Publishing.

*** Latest editions of all the suggested books are recommended.**

Semester I/II
BASIC ELECTRONICS ENGINEERING

Course Code: EEC101/EEC201

L	T	P	C
3	2	0	4

Objective

- To understand the basic concept of Electronics Engineering like PN Junction, Bipolar Junction Transistor, Field Effect Transistor, Operational Amplifier etc.

Course Contents

Unit I

PN Junction: Properties of Elements, Crystal Structure, Energy band diagram , Introduction to PN-Junction, Depletion layer, V-I characteristics Diode Ratings (average current, peak-inverse voltage) p-n junction as rectifiers (half wave and full wave), filter, calculation of ripple factor and load regulation, clipping and clamping circuits. Zener diode and its application as shunt regulator.

(Lectures 08)

Unit II

Bipolar Junction Transistor (BJT): Basic construction, transistor action, CB, CE and CC configurations, input/output characteristics, Biasing of transistors, Fixed bias, emitter bias, potential divider bias, Graphical analysis of CE amplifier, concept of Voltage gain current gain, λ-parameter model (low frequency). Computation of Ai, Av, Ri , Ro of single transistor CE amplifier configuration. **(Lectures 08)**

Unit III

Field Effect Transistor (FET): Basic construction of JFET, Principle of working, concept of pinch-off maximum drain saturation current, input and transfer characteristics, Characteristics equation, CG, CS and CD Configuration, fixed and self biasing of JFET amplifier Introduction of MOSFET, Depletion and Enhancement type MOSFET- Construction, Operation and Characteristics.

(Lectures 08)

Unit IV

Operational Amplifier (Op-Amp): Concept of ideal operational amplifier, ideal and practical Op-Am parameters, inverting, non-inverting and unity gain configurations. Applications of Op-Amp as adders, difference amplifiers, integrators and differentiator. **(Lectures 08)**

Unit V

Switching Theory: Number system, conversion of bases(decimal, binary, octal and hexadecimal numbers), Adder & Subtraction, BCD numbers, Seven Segment Display, Boolean Algebra, Logic gates, Concept of universal gates, Canonical forms, minimization using K-Map **(Lectures 08)**

Text Books

1. Robert Boylestad *Electronic Circuit and Devices*
2. Millman & Halkias, *Integrated Electronics*, McGraw Hill
3. Millman & Halkias, *Electronics Devices and Circuits*, McGraw Hill
4. Morris Mano M., *Digital Design*.

Reference Books

1. Sedra and Smith, *Microelectronic Circuits*
2. Gayakwad, R A, *Operational Amplifiers and Linear Integrated circuits*, PHI
3. Chattopadhyay D and P C Rakshit, *Electronics Fundamentals and Applications*, New Age International.

*** Latest editions of all the suggested books are recommended.**

Semester-I
FOUNDATION ENGLISH - I

Course code: EHM101
(Common with BPH105/BED105/BAL101/AR107/BHM101/BFS106/BCA106/BBA106/ BCH106/ BFA103)

L	T	P	C
2	0	2	3

Course Contents:

Unit I

Functional Grammar: Patterns & Parts of speech Subject, Predicate, Noun, Pronoun, Adjective, Adverb, Verb, Verb phrases, Conjunction, Interjection. **(10 Hours)**

Unit II

Vocabulary: Word formation, Prefix, Suffix, Compound words, Conversion, Synonyms, Antonyms, Homophones and Homonyms, How to look up a dictionary. **(10 Hours)**

Unit III

Communication: Meaning & importance of communication, Barriers to effective communication, Channels of communication, Language as a tool of communication. **(10 Hours)**

Unit IV

Requisites of Sentence writing: Fragmented sentences, A good sentence, expletives, Garbled sentences, Rambling sentences, Loaded sentences, Parallel Comparison, Squinting construction, Loose & periodic sentences. **(10 Hours)**

Text Books:

1. Martin & Wren - *High School English Grammar & Composition,* S.Chand & Co. Delhi.
2. Lewis Norman - *Word Power made easy,* W.R.Goyal. Publication & Distributors Delhi.
3. Better Your English- A Workbook for 1st year Students- Macmillan India, New Delhi.

Reference Books:

1. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practice* – O.U.P. New Delhi. 2007.
2. Mohan Krishna & Banerji Meera, *Developing Communication Skills* – Macmillan India Ltd. Delhi.
3. Rosen Blum M., *How to Build Better Vocabulary* – Bloomsbury Publication. London.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

Semester I/II
PHYSICS (LAB)

Course Code: EAS151/EAS251

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

1. To determine the wavelength of Sodium light by Newton's rings.
2. To determine the wavelength of Sodium light by Fresnel's Biprism.
3. To determine the Specific Rotation of the Cane sugar solution with the help of Polari meter.
4. To determine the wavelength of the sodium light by Michelson's interferometer.
5. To study the PN junction characteristics.
6. To determine the high resistance by Leakage method.
7. To study the energy band gap by four probe method.
8. To study the variation of magnetic field using Stewart and Gee's apparatus.
9. To determine the frequency of A.C. mains by means of a Sonometer.
10. To study the Hall Effect.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I/II
CHEMISTRY (LAB)

Course Code: EAS152/EAS252

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

1. To determine total alkalinity in the given water sample.
2. To determine the temporary and permanent hardness in water sample using EDTA as standard solution.
3. To determine the available chlorine in bleaching powder solution.
4. To determine the chloride content in the given water sample by Mohr's method.
5. To determine the pH of the given solution using pH meter and pH-metric titration.
6. To determine the Equivalent weight of Iron by the chemical displacement method.
7. To determine the Viscosity of an addition polymer like polyester by Viscometer.
8. To determine the dissolved oxygen present in a water sample.
9. To prepare the Bakelite resin polymer.
10. To determine the viscosity of a given sample of a lubricating oil using Redwood Viscometer.
11. To determine the carbon dioxide content in polluted water sample.
12. To find chemical oxygen demand of waste water sample by potassium dichromate.
13. To determine the total hardness in water sample using complexometric method.
14. To determine the iron content in the given sample using external indicator.
15. To determine the strength of given HCL solution by titrating against N/10 Standard Sodium hydroxide solution.

Note: Minimum of 10 experiments has to be completed for completion of curriculum.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I/II
ENGINEERING MECHANICS (LAB)

Course Code: EME151/EME251

L	T	P	C
0	0	3	2

(Any 10 experiments of the following or such experiments suitably designed)

LIST OF EXPERIMENTS

1. To conduct the tensile test and determine the ultimate tensile strength, percentage elongation for a steel specimen.
2. To determine the compression test and determine the ultimate compressive strength for a specimen
3. To conduct the Impact-tests (Izod / Charpy) on Impact-testing machine to find the toughness.
4. To determine the hardness of the given specimen using Vicker/ Brinell/Rockwell hardness testing machine.
5. Friction experiment(s) on inclined plane and/or on screw-jack.
6. Worm & worm-wheel experiment for load lifting.
7. Torsion of rod/wire experiment.
8. Experiment on Trusses.
9. Study of 2-stroke and 4 -stroke I.C.E. models.
10. To determine the velocity ratio, mechanical advantage & efficiency of a single purchase crab apparatus & draw a graph of load vs. effort, mechanical advantage and efficiency.
11. To determine the velocity ratio, mechanical advantage & efficiency of a double purchase crab apparatus.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)</td><td rowspan="2">ATTENDANCE (5 MARKS)</td><td rowspan="2">QUIZ (5 MARKS)</td><td rowspan="2">VIVA (10 MARKS)</td><td rowspan="2">TOTAL INTERNAL (50 MARKS)</td></tr>
<tr><td>EXPERIMENT (10 MARKS)</td><td>FILE WORK (10 MARKS)</td><td>VIVA (10 MARKS)</td></tr>
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External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I/II
ENGINEERING DRAWING (LAB)

Course Code: EME152/EME252

L	T	P	C
0	0	3	2

Introduction: Graphics as a tool to communicate ideas, Lettering and' dimensioning, Construction of geometrical figures like pentagon and hexagon.

Orthographic Projection: Principles of orthographic projections, Principal and auxiliary planes, First and Third angle projections. Projection of points. Pictorial view.
Projection of lines parallel to both the planes. Parallel to one and inclined to other, Inclined to both the planes. Application to practical problems.
Projection of solid in simple position, Axis or slant edge inclined to one and parallel to other plane, Solids lying on a face or generator on a plane.
Sectioning of solids lying in various positions, True shape of the section.
Development of lateral surfaces, sheet metal drawing.

Isometric Projection: Principles of isometric projection, Isometric projection using box and offset methods.

Reference Books

1. Bhatt. N.D., *Elementary Engineering Drawing*, Charothar Publishing.
2. Laxmi Narayan V & Vaish W., *A Text Book of Practical Geometry on Geometrical Drawing*.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I/II
COMPUTER BASICS &'C' PROGRAMMING (LAB)

Course Code: ECS151/ECS251

L	T	P	C
0	0	3	2

Course Contents

1. WAP to calculate Sum & average of N numbers.
2. WAP to convert integer arithmetic to a given number of day and month.
3. WAP to find maximum and minimum out of 3 numbers a, b & c.
4. WAP to find factorial of positive integer.
5. WAP to find sum of series up to n number, 2+5+8+……+n.
6. WAP to print all the number between 1 to 100 which are dividing by 7.
7. WAP to generate Fibonacci series up to n.
8. Write a function to calculate area of circle.
9. Write a recursive function to calculate factorial of given number.
10. WAP to find whether number is prime or not.
11. WAP to find that the enter character is a letter or digit.
12. WAP to find addition of two matrix of n*n order.
13. WAP to find multiplication of two matrix of n*n order.
14. WAP to add 6 digit numbers in even case & multiple 6 digit number in odd case.
15. WAP to find even or odd up to a given limit n.
16. WAP to find whether a given no is palindrome or not.
17. WAP to joining & Comparing the 2 string.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I/II
WORKSHOP PRACTICE (LAB)

Course Code: EME153/EME253

L	T	P	C
0	0	3	2

List of Experiments

Carpentry Shop:
1. Study of tools & operations and carpentry joints.
2. Simple exercise using jack plane.
3. To prepare half-lap corner joint, mortise & joints.
4. Simple exercise on woodworking lathe.

Fitting Bench Working Shop:
1. Study of tools & operations
2. Simple exercises involving fitting work.
3. Make perfect male-female joint.
4. Simple exercises involving drilling/tapping

Black Smithy Shop:
1. Study of tools & operations
2. Simple exercises based on black smithy operations such as upsetting, drawing down, punching, bending & swaging.

Welding Shop:
1. Study of tools & operations of Gas welding & Arc welding
2. Simple butt and Lap welded joints.
3. Oxy-acetylene flame cutting.

Sheet-metal Shop:
1. Study of tools & operations.
2. Making Funnel complete with 'soldering'.
3. Fabrication of tool-box, tray, electric panel box etc.

Machine Shop:
1. Study of machine tools and operations.
2. Plane turning.
3. Step turning
4. Taper turning.
5. Threading

Foundry Shop:
1. Study of tools & operations
2. Pattern making.
3. Mould making with the use of a core.
4. Casting

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I/II
BASIC ELECTRICAL ENGINEERING (LAB)

Course Code: EEE151/EEE251

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

1. To study the KCL & KVL.
2. To study the Super position theorem.
3. To study the Thevenin theorem.
4. To study the Norton's theorem.
5. To study the Maximum Power theorem.
6. To determine the efficiency of single phase transformer by load test.
7. To determine the external characteristics of DC Shunt generator.
8. Speed control of D.C Shunt Motor.
9. To measure the power in a 3- ø system by two-wattmeter method
10. To improve the power factor in an RLC circuit using capacitor.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I/II
BASICS ELECTRONICS ENGINEERING (LAB)

Course Code: EEC151/EEC251

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

1. V-I characteristics of P-N junction diode.
2. Application of diode as clipper and clamper.
3. Half wave & Full wave rectifier.
4. I/P & O/P characteristics of transistor in CB configuration.
5. I/P & O/P characteristics of transistor in CE configuration.
6. Verify the truth table of half adder & full adder.
7. OP-amp as inverting & non Inverting amplifier using IC 741.
8. OP-amp as differentiator & Integrator.
9. Zener diode as a Shunt Regulator.
10. Verify the truth table of logic gates.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I
DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP171

L	T	P	C
0	0	0	1

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).

Semester II
ENGINEERING MATHEMATICS- II

Course Code: EAS201

L	T	P	C
3	2	0	4

Objective:

- To familiarize the basic concept of Differential Equations, Laplace Transform, Fourier series and Partial Differential Equations etc.

Course Contents

Unit I

Differential Equations: Ordinary differential equations of first order, Exact differential equations, Linear differential equations of first order, Linear differential equations of nth order with constant coefficients, Complementary functions and particular integrals, Simultaneous linear differential equations, Solutions of second order differential equations by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems (without derivation). **(Lectures 08)**

Unit II

Series Solutions and Special Functions: Series solutions of ODE of 2nd order with variable coefficients with special emphasis to differential equations of Legendre, and Bessel. Legendre polynomials, Bessel's functions and their properties. **(Lectures 08)**

Unit III

Laplace Transform: Laplace transform, Existence theorem, Laplace transform of derivatives and integrals, Inverse Laplace transform, Unit step function. Diracth delta function, Laplace transform of periodic functions, Convolution theorem, Application to solve simple linear and simultaneous differential equations. **(Lectures 08)**

Unit IV

Fourier Series and Partial Differential Equations: Periodic functions, Trigonometric series, Fourier series of period 2p , Euler's formulae, Functions having arbitrary period, Change of interval, Even and odd functions, Half range sine and cosine series.

Introduction of partial differential equations, Linear partial differential equations with constant coefficients of 2nd order and their classifications - parabolic, elliptic and hyperbolic with illustrative examples. **(Lectures 08)**

Unit V

Applications of Partial Differential Equations: Method of separation of variables for solving partial differential equations, Wave equation up to two dimensions, Laplace equation in two-dimensions, Heat conduction equations up to two-dimensions, Equations of transmission Lines. **(Lectures 08)**

Text Books

1. Grewal B.S., *Higher Engineering Engineering Mathematics*, Khanna Publishers.
2. Prasad C., *Engineering Mathematics for Engineers*, Prasad Mudralaya
3. Das H.K., Engineering Engineering Mathematics Vol-II, S. Chand, New Delhi

Reference Books

1. Kreyszig E., *Advanced Engineering Engineering Mathematics*, Wiley Eastern
2. Piskunov N, *Differential & Integral Calculus*, Moscow Peace Publishers.
3. Narayan Shanti, *A Text book of Matrices*, S. Chand
4. Bali N.P., Engineering Engineering Mathematics-II.

*** Latest editions of all the suggested books are recommended.**

Semester-II
FOUNDATION ENGLISH - II

Course code: EHM 201
(Common with BPH206/BBA206/BCA206/BHM201/AR207/BCH206/BFA203)

L	T	P	C
2	0	2	3

Unit I
Functional Grammar: Articles, Preposition, Tenses: Functions, Synthesis, Transformation, Spotting errors and correction of sentences. **(10 Hours)**

Unit II
Pre- Requisites of Technical written Communication: One word substitution, Spelling rules, Words often confused & misused, Phrases. **(10 Hours)**

Unit III
The Structure of sentences/ clauses: Adverb clause, Adjective clause, Noun clause. Sentences: Simple, Double, Multiple and complex, Transformation of sentences: simple to complex & vice versa, simple to compound & vice-versa, Interrogative to assertive & negative & vice-versa. **(10 Hours)**

Unit IV
Technical Communication: Nature, Origin and Development, Salient features, Scope & Significance, Forms of Technical Communication, Difference between Technical Communication & General writing, Objective Style vs. Literary Composition. **(10 Hours)**

Text-Books:
1. Wren & Martin, *High School English Grammar & Composition* – S. Chand & Co. Delhi.
2. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practice* – O.U.P. New Delhi. 2007.
3. Mitra Barum K., *Effective Technical Communication* – O.U.P. New Delhi. 2006.
4. Better Your English- A Workbook for 1st year Students- Macmillan India, New Delhi.

Reference Books:
1. Horn A.S., *Guide to Patterns & Usage in English* – O.U.P. New Delhi.

NOTE:
This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

Semester II
DISCIPLINE &GENERAL PROFICIENCY

Course Code: EGP271

L	T	P	C
0	0	0	1

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).

Semester III
DISCRETE STRUCTURE

Course Code: ECS301

L	T	P	C
3	2	0	4

Objective: Discrete mathematics has become popular in recent decades because of its applications to computer science. Concepts and notations from discrete mathematics are useful in studying and describing objects and problems in computer algorithms and programming languages, and have applications in cryptography, automated theorem proving, and software development.

Unit I

Propositional Calculus: Propositions, Truth tables, Logical Equivalence, Logical implications, Algebra of propositions, Conditional propositions, Converse, Inverse, Contra-positive, Bi conditional statements, Negation of Compound statements, Tautologies and Contradiction, Normal Forms, Arguments, Fallacies, Quantifiers, Mathematical Induction.

(Lectures 08)

Unit II

Boolean Algebra and Circuits: Boolean Algebra, Boolean Expression, Logic Gates, Logic Circuits, Boolean Functions, Sum of Product and Product of Sum Forms, Canonical Forms, Simplification of functions using K-Map.

(Lectures 08)

Unit III

Set Theory: Basic concepts of Set theory, some operations on sets, Venn diagram, Basic Set identities, Cartesian product. Relation Definition, Types of relation, Pictorial representation of relation, Composition of Relation, Equivalence relation. Function definition, Classification of function, Types of function (one to one, many to one, into, onto, bijective), Composition of function, Inverse function, Identity function.

(Lectures 08)

Unit IV

Combinatorics: Fundamental principles, Permutation and Combination, Recurrence Relation, Generating Function, Binomial Theorem.

(Lectures 08)

Unit V

Graphs and Trees: Introduction to graphs, Graph terminology, Application of Graphs, Finite and Infinite graphs, Incidence and Degree, Isolated vertex, Pendent Vertex, and Null graph. Trees and their properties, Rooted and Binary trees, Tree traversal (Pre order, Post order, in order).

(Lectures 08)

Text Books

1. Rawool Vinay & Raul Bhakti, *Discrete Mathematics*, Tech Max Publication.
2. Sarkar Swapan Kumar, *Discrete Mathematics,* S Chand.
3. Deo Narsingh, *Graph Theory with Applications to Engineering and Comp. Sci.*, PHI.

Reference books

1. Lipchitz Seymour & Schaum Marc Lipson, *Discrete Mathematics*, Outline series TMH.
2. Liu C.L., *Elements of Discrete Mathematics*.
3. Dean Neville, *Essence of Discrete Mathematics*, Prentice Hall.
4. Rosen Kenneth H., *Discrete Mathematics and Its Applications*, McGraw Hill.
5. Johnsonbaugh Richard, *Discrete Mathematics*, Macmillan.

*** Latest editions of all the suggested books are recommended.**

Semester III
OBJECT ORIENTED PROGRAMMING SYSTEM

Course Code: ECS302

L	T	P	C
3	2	0	4

Objective: Object-oriented programming (OOP) is a programming paradigm that uses "objects" and their interactions to design applications and computer programs. Programming techniques may include features such as information hiding, data abstraction, encapsulation, modularity, polymorphism, and inheritance.

Course Contents

Unit I

Different paradigms for problem solving, need for OOP, differences between OOP and Procedure oriented programming, Overview of OOP principles, Abstraction, Encapsulation, Inheritance and Polymorphism.

Object & Classes: Links and Associations, Generalization, Aggregation, Abstract classes, Generalization, Meta data. State model: Events and States, Operations and Methods, Nested state diagrams, Concurrency, Relation of Object and Dynamic Models.

Functional Models: Data flow diagrams, Specifying Operations, Constraints, OMT Methodologies, examples and case studies to demonstrate methodology. **(Lectures 08)**

Unit II

C++ Basics: Structure of a C++ program, Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions, Pointers, Arrays, Pointers and Arrays, Strings, Structures, Flow control statement- if, switch, while, for, do, break, continue, go to statements. Functions-Scope of variables, Parameter passing, Default arguments, inline functions, Recursive functions, Pointers to functions. Dynamic memory: allocation and reallocation operators-new and delete, Preprocessor directives. **(Lectures 08)**

Unit III

C++ Classes And Data Abstraction: Class definition, Class structure, Class objects, Class scope, this pointer, Friends to a class, Static class members, Constant member functions, Constructors and Destructors, Dynamic creation and destruction of objects, Data abstraction.

Polymorphism: Function overloading, Operator overloading, Generic programming-necessity of templates, Function templates and class templates.

Inheritance: Defining a class hierarchy, Different forms of inheritance, Defining the Base and Derived classes, Access to the base class members, Base and Derived class construction, Destructors, Virtual base class. **(Lectures 08)**

Unit IV

Virtual Functions And Polymorphism: Static and Dynamic bindings, Base and Derived class virtual functions, Dynamic binding through virtual functions, Virtual function call mechanism, Pure virtual functions, Abstract classes, Implications of polymorphic use of classes, Virtual destructors. **(Lectures 08)**

Unit V

C++ I/O: I/O using C functions, Stream classes hierarchy, Stream I/O, File streams and String streams, Overloading << & >> operators, Error handling during file operations, Formatted I/O. **(Lectures 08)**

Text Books

1. James etal Rambaugh , *Object Oriented Design and Modeling*, PHI-1997
2. Lafore.R, *Object Oriented Programming in C+*, Galigotia Publications Pvt. Ltd.
3. E.Balagurusamy , *Object Oriented Programming with C++*, TMH, 2001

Reference Books

1. Lippman.S.B and Lajoie.J, *C++ Primer,* Pearson Education
2. Stroutstrup.B,*The C++ Programming Language*, Pearson Education.

*** Latest editions of all the suggested books are recommended.**

Semester III
OPERATING SYSTEM

Course Code-ECS303

L	T	P	C
3	2	0	4

Objective: To provide an understanding of the functions and modules of an operating system and study the concepts underlying its design and implementation.

Course Contents

Unit I

Introduction to the Operating System, Types of OS: Batch System, Time Sharing System, Real Time System. Multi Programming, Distributed System, Functions of Operating System, Operating System Services, System calls, system programs, Virtual machines. **(Lectures 08)**

Unit II

Process Management: Process Concept, Process State, Process Control Block, Process Scheduling, CPU Scheduling - CPU Scheduling, Scheduling Criteria, Scheduling Algorithms, Preemptive & Non Preemptive Scheduling. **(Lectures 08)**

Unit III

Process Synchronization: Critical Section Problem, Race Condition, Synchronization Hardware, Semaphores, Classical Problems of Synchronization.

Deadlocks: Characterization, Methods for Handling Deadlocks Avoidance, Deadlock Detection & Recovery from Deadlock. **(Lectures 08)**

Unit IV

Memory Management: Contiguous Allocation, External and Internal Fragmentation, Paging & Segmentation.

Virtual Memory: Concept of Virtual Memory, Concept of Demand Paging, Page Replacement Algorithms, Allocation of Frames, Thrashing. **(Lectures 08)**

Unit V

Directory Structure, Allocation Methods; Contiguous Allocation, Linked Allocation, Indexed Allocation Free Space Management. Disk Structure, Disk Scheduling Algorithms, Disk Management.

(Lectures 08)

Text Books

1. Silbershatz and Galvin, *Operating System Concept*, Addition We seley, 2002.
2. G.Nutt, *Operating Systems*, Addison-Wesley.
3. Ahyut Godbole,"*Operating System*, PHI, 2003.

References Books

1. Mchoes.Flynn,*Understanding Operating System*, Thomson Press, 2003
2. Tannenbaum, *Operating System Concept*, Addition Weseley, 2002.
3. R.C.Joshi, and S.Tapaswi, *Operating Systems*, Wiley Dreamtech.

*** Latest editions of all the suggested books are recommended.**

Semester III

DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION

Course Code: EEC302

L	T	P	C
3	2	0	4

Objective: To manage the computer hardware and to study the overall architecture & organization of the computer system.

Course Contents

Unit I

Introduction: Data representation Data Types and Number Systems, Binary Number System, Octal & Hexa-Decimal Number System, Fixed Point Representation, 1's &2's Complement, Binary Fixed Point Representation, Arithmetic Operation on Binary Numbers, Overflow &Underflow, Floating Point Representation, Codes, ASCII, EBCDIC Codes, Gray Code, Excess-3 & BCD, Error Detection & Correcting Codes Binary Storage and Registers. **(Lectures 08)**

Unit II

Boolean algebra and digital logic circuits - Logic Gates, AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR Gates, Boolean Algebra, Basic Definition and Properties, Basic Boolean Law's, Demorgan's Theorem Map Simplification, Minimization Techniques, K Map Two, Three and More variables maps, Sum of Product & Product of Sums, Don't care conditions, Combination & Sequential Circuits, Half adder &Full adder, Full subtractor, and decimal adder, Code Conversion, Multilevel NAND and NOR Circuits, Multiplexers and Demultiplexers, RAM and ROM Working & Circuit. **(Lectures 08)**

Unit III

Sequential logic- Flip-Flops - RS, D, JK & T Flip-Flop, Triggering in flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, flip flop excitation tables, Design procedure and design of counters. Design with equations, Registers, Counters and the memory unit, Shift registers, Ripple counters and Synchronous counters, Timings sequence digital logic families. Processor organization, general register organization, stack organization and addressing modes.

(Lectures 08)

Unit IV

Registers transfer logic, Intel Register Transfer, Arithmetic Logic and Shift Micro Operation, Conditional, Constant Statement, Fixed Point Binary Data Floating Point Data, Instruction Codes. Input-output organizations- I/O Interface, Properties of simple I/O Devices and their controller, Isolated Vs Memory-mapped I/O, Modes of data transfer, Synchronous & Asynchronous data transfer. **(Lectures 08)**

Unit V

Basic organization of the computer and block level description of the functional units as related to the execution of a program; Fetch, decode and execute cycle.

Memory organization - Auxiliary Memory, Magnetic Drum, Disk & Tape, Semi-conductor memories, memory, Hierarchy, Associative memory, Virtual memory, Address space & memory space, Address mapping, page table, Page replacement, segmentation, Cache memory, Hit ratio, Mapping techniques, Writing into cache. **(Lectures 08)**

Text Book

1. Mano M., *Computer System Architecture*, PHI
2. Mano Morris, *Digital Logic*, PHI Publication
3. Stallings , *Computer Organization,* PHI

Reference Books

1. Zaky Vravice, & Hamacher, *Computer Organization*, TMH Publication
2. Tannenbaum, *Structured Computer Organization*, PHI
3. Hayes P.John"*Computer Organization*, McGraw Hill

*** Latest editions of all the suggested books are recommended.**

Semester III
ORGANISATIONAL BEHAVIOUR

Course Code: EHM302

L	T	P	C
3	2	0	4

Objective: The objective of this syllabus is to make the students aware about how to study the behavior of the employees who are working in organization and to motivate them so that the organization can get the work done through people.

Course Content

Unit I

Concept, Nature, Characteristics, Models of Organizational Behaviour, Management Challenge, Organizational Goal. Global challenges and Impact of culture. **(Lectures 08)**

Unit II

Perception: Concept, Nature, Process, Importance. Attitudes and Workforce Diversity.
Personality: Concept, Nature, Types and Theories of Personality Shaping, Learning: Concept and Theories of Learning. **(Lectures 08)**

Unit III

Motivation: Concepts and Their Application, Principles, Theories, Motivating a Diverse Workforce.
Leadership: Concept, Function, Style and Theories of Leadership-Trait, Behavioural and Situational Theories. Analysis of Interpersonal Relationship, Group Dynamics: Definition, Stages of Group Development, Formal and Informal Groups, Group Decision Making. **(Lectures 08)**

Unit IV

Organizational Power and Politics: Concept, Sources of Power, Approaches to Power, Political Implications of Power. Knowledge Management & Emotional Intelligence in Contemporary Business Organization.
Organizational Change: Concept, Nature, Resistance to change, Managing resistance to change, Implementing Change. **(Lectures 08**

Unit V

Conflict: Concept, Sources, Types, Functionality and Dysfunctional of Conflict, Classification of Conflict Intra, Individual, Interpersonal, Intergroup and Organizational, Resolution of Conflict, Stress: Understanding Stress and Its Consequences, Causes of Stress, Managing Stress.

Organizational Culture: Concept, Characteristics, Elements of Culture, Implications of Organization culture. **(Lectures 08)**

Text Books:

1. W Newstrom John, Organizational *Behavior: Human Behavior at Work*, Tata Mc Graw Hill
2. Fred,Luthans, *Organizational Behaviour*, Tata Mc Graw Hill
3. Shane L Mc. Steven, Glinow Mary Ann Von & Sharma Radha R., "*Organizational Behavior*" Tata Mc Graw Hill

Reference Books

1. Robbins Stephen P., *Organizational Behavior* Pearson Education
2. Hersey Paul, "*Management of Organsational Behavior: Leading Human Resources*" Blanchard, Kenneth H and Johnson Dewey E., Pearson Education
3. Khanka S. S. "*Organizational Behavior*

*** Latest editions of all the suggested books are recommended.**

Semester-III
PROFESSIONAL WRITING

Course code: EHM301
(Common with BBA306/BCA305/BHM301/AR307/BCH306/BFA303)

L	T	P	C
2	0	2	3

Course Contents:

Unit I
Functional Grammar: Active and passive voice, Conditional sentences, Syntax, Concord, Common errors. **(10 Hours)**

Unit II
Requisites of Paragraph writing: Structure of Paragraph, Coherence & Unity, Development of paragraph, Inductive order, Deductive order, Spatial order, Linear, Chronological orders, Expository writing, and Argumentative writing, Factual description of objects, process, experiments. **(10 Hours)**

Unit III
Précis Writing: Techniques of Précis writing, Writing a précis. **(10 Hours)**

Unit IV
Comprehension skills: Role of listening, Reading comprehension; Reasons for poor comprehension, Improving comprehension skills. **(10 Hours)**

Text Books:
1. Ruther Ford A., *Basic Communication Skills* – Pearson Education, New Delhi.

References Books:
1. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practice* – O.U.P. New Delhi. 2007.
2. Mohan Krishna & Banerji Meera, *Developing Communication Skills* – Macmillan India Ltd. Delhi.

NOTE:
This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

Semester III
C++ PROGRAMMING (LAB)

Course Code: ECS351

L	T	P	C
0	0	4	2

Write programs in C++ for the following

1. Program illustrating overloading of various operators.
2. Program illustrating use of Friend, Inline, Static Member functions, default arguments.
3. Program illustrating use of destructor and various types of constructor.
4. Program illustrating various forms of Inheritance.
5. Program illustrating use of virtual functions, virtual Base Class.
6. Program illustrating how exception handling is done.
7. Program implementing various kinds of sorting algorithms, Search algorithms & Graph algorithms.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.
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Semester III
DIGITAL LOGIC AND CIRCUIT (LAB)

Course Code: EEC351

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS.

1) Study of following combinational circuits: Multiplexer, Demultimplexer and Encoder. Verify truth tables of various logic functions.
2) Study of various combinational circuits based on: AND/NAND Logic blocks and OR/NOR Logic blocks.
3) To study various waveforms at different points of a transistor bistable multivibrator and its frequency variation with different parameters.
4) To design a frequency divider using IC-555 timer.
5) To study various types of registers and counters.
6) To study Schmitt trigger circuit.
7) To study transistor as table multi-vibrator.
8) Experimental study of characteristics of CMOS integrated circuits.
9) Interfacing of CMOS to TTL and TTL to CMOS.
10) BCD to binary conversion on digital IC trainer.
11) Testing of digital IC by automatic digital IC trainer.
12) To study OP-AMP as Current to Voltage & Voltage to Current converters & comparator.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)</td><td rowspan="2">ATTENDANCE (5 MARKS)</td><td rowspan="2">QUIZ (5 MARKS)</td><td rowspan="2">VIVA (10 MARKS)</td><td rowspan="2">TOTAL INTERNAL (50 MARKS)</td></tr>
<tr><td>EXPERIMENT (10 MARKS)</td><td>FILE WORK (10 MARKS)</td><td>VIVA (10 MARKS)</td></tr>
</table>

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester III
UNIX & SHELL PROGRAMMING (LAB)

Course Code: ECS352

L	T	P	C
0	0	4	2

List of Experiments:

1. Write Shell Script for UNIX environment.
2. Understanding of basic commands of UNIX administration, user authorization, grant of users right and privileges, backup and recovery.
3. Source Code Control System understanding Lex and Yacc, debugger tools (Lint, make etc.)
4. Write program in C for Process Creation, Parent/Child process relationship, forking of process. Inter Process Communication and socket programming implementation of exec system call, pipe, and semaphore and message queue.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester III
DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP371

L	T	P	C
0	0	0	1

Guidelines

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).

Semester IV

THEORY OF COMPUTATION

Course Code: ECS401

L	T	P	C
3	2	0	4

Objective: To give the brief knowledge of computer Automation and Computation.

Course Contents

Unit I

Introduction; alphabets, Strings and Languages; automata and Grammars Finite automata (FA) -its behavior; DFA -Formal definition, simplified notations (state transition diagram, transition table), Language of a DFA. NFA -Formal definition, Language of an NFA, Removing, epsilon transitions. Equivalence of DFAs and NFAs Regular expressions (RE) -Definition, FA and RE, RE to FA, FA to RE, algebraic laws for RE, applications of REs. Regular grammars and FA, FA for regular grammar. **(Lectures 08)**

Unit II

Proving languages to be non-regular –using Pumping Lemma. Some closure properties of Regular languages -Closure under Boolean operations, reversal, homomorphism, inverse homomorphism, etc. M hill-Nerode theorem DFA Minimization Some decision properties of Regular languages - emptiness, finiteness, membership, equivalence of two DF As or REs. Two-way finite automata, Finite automata with output. **(Lectures 08)**

Unit III

Context-free Grammars (CFGs) -Formal definition, sentential forms, leftmost and rightmost derivations,, the language of a CFG. Derivation tree or Parse tree -Definition, Relationship between parse trees and derivations. Parsing and ambiguity, Ambiguity in grammars and Languages Pushdown Automata (PDA) -Formal definition, behavior and graphical notation, Instantaneous descriptions (Ids), The language of PDA (acceptance by final state and empty stack). Equivalence of acceptance by final state and empty stack, Equivalence of PDAs and CFGs, CFG to PDA, PDA to CFG, DPDAs -Definition, DPDAs and Regular Languages, DPDAs and CFLs. **(Lectures 08)**

Unit IV

Languages of DPDAs, DPDAs, and ambiguous grammars. Simplification of CFGs. Normal forms - CNF and GNF Proving that some languages are not context free -Pumping lemma for CFLs Some closure properties of CFLs -Closure under union, concatenation, Kleene closure, substitution, homomorphism, reversal, intersection with regular set, etc. Some more decision properties of CFLs, Review of some undecidable CFL problems. **(Lectures 08)**

Unit V

Turing Machines (TM) -Formal definition and behavior, Transition diagrams, Language of a TM, TM as accepters and deciders. TM as a computer of integer functions Programming techniques for TMs -Storage in state, multiple tracks, subroutines, etc. Variants of TMs –Multi tape TMs, Nondeterministic TMs. TMs with semi-infinite tapes, multi stack machines. The universal language, Undecidability of the universal language, The Halting problem, Undecidable problems about TMs. Post's Correspondence Problem (PCP) -Definition, Undecidability of PCP. Other undecidability problems e.g. some problems related to CFLs Context sensitive language and linear bounded automata. Chomsky hierarchy. (**Lectures 08)**

Text Books

1. Ullman Hopcroft, *Introduction to Automata Theory, Language and Computation*, Nerosa Publishing House
2. Mishra K.L.P. and Chandrasekaran N., *Theory of Computer Science (Automat Language and Computation)*, PHI

3. Martin J.C., *Introduction to Language and Theory of Computation*, TMH

Reference Books

1. Papadimitrou C.& Lewis, *Elements of Theory of Computation*, PHI
2. DIA Cohen, *Introduction to computer Theory*, John Wiley& Sons
3. Kumar Rajendra, *Theory of Automata (Language and Computation)*, PPM

*** Latest editions of all the suggested books are recommended.**

Semester IV
DATABASE MANAGEMENT SYSTEM

Course Code: ECS402

L	T	P	C
3	2	0	4

Objective: The objective of the subject is to make the students aware of the concepts of Data base management system. This subject includes Data Modeling using the Entity Relationship Model, SQL, Normalization, Transaction Processing Concepts, and Concurrency Control Techniques.

Course Content

Unit I

Introduction: An overview of database management system, database system Vs file system, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure. ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree. **(Lectures 08)**

Unit II

Relational data Model and Language: Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus.

Introduction to SQL: Characteristics of SQL. Advantage of SQL. SQL data types and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations. Joins, Unions, Intersection, Minus, Cursors in SQL. **(Lectures 08)**

Unit III

Data Base Design & Normalization: Functional dependencies, normal forms, first, second, third normal forms, BCNF, loss less join, decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design. **(Lectures 08)**

Unit IV

Transaction Processing Concepts: Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling. **(Lectures 08)**

Unit V

Concurrency Control Techniques: Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes, Recovery with concurrent transaction. **(Lectures 08)**

Text Books

1. Date C,J., *An Introduction to Database System*, Addision Wesley
2. Sudarshan Korth, Silbertz, *Database Concepts*, McGraw Hill
3. Elmasri, Navathe, *Fundamentals of Database Systems*, Addision Wesley

Reference Books

1. Bipin C. Desai, *An introduction to Database Systems,* Galgotia Publication
2. Majumdar & Bhattacharya, *Database Management System*, TMH
3. Ramakrishnan, Gehrke, *Database Management System*, McGraw Hill
4. Kroenke, *Database Processing: Fundamentals, Design and Implementation*, Pearson Education.
5. Leon & Leon, *Database Management System*, Vikas Publishing House.

*** Latest editions of all the suggested books are recommended.**

Semester IV
DATA STRUCTURE USING 'C'

Course Code: ECS403

L	T	P	C
3	2	0	4

Objective: The objective of the paper is to give the practical knowledge and the concept of how the data is exactly stored in memory. It also gives knowledge to perform different operations on data using concept of C programming.

Course Contents

Unit I

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off

Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Ordered List, Sparse Matrices.

Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. **(Lectures 08)**

Unit II

Queues

Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty. Circular queue, Deque, and Priority Queue.

Linked List: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Garbage Collection and Compaction. **(Lectures 08)**

Unit III

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree. Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees. Traversing Threaded Binary trees, Huffman algorithm.

Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions. **(Lectures 08)**

Unit IV

Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting.

Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees. **(Lectures 08)**

Unit V

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

File Structures: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Comparisons. **(Lectures 08)**

Text Books

1. Lipschutz , *Data Structure*, TMH
2. Tenenbaum etal A M, *Data Structures using C & C++*, PHI
3. Yashwant Kanitkar, *Data Structure using C++*.

Reference Books

1. Sahani and Horowitz, *Fundamentals of Data Structures*, Galgotia
2. Kruse etal R., *Data Structures and Program Design in C*, Pearson Education
3. Cormen T. H., *Introduction to Algorithms*, PHI
4. Loudon K., *Mastering Algorithms With C,* Shroff Publisher & Distributors
5. Bruno R Preiss, *Data Structures and Algorithms with Object Oriented Design Pattern in C++*, Jhon Wiley & Sons, Inc.

*** Latest editions of all the suggested books are recommended.**

Semester IV
SOFTWARE ENGINEERING

Course Code: ECS404

L	T	P	C
3	2	0	4

Objective: The aim of this subject is to provide essential knowledge about engineering aspects in software development. Without the knowledge of software engineering concepts, programmers don't turn out to deliver good software product.

Unit I

Introduction: Introduction to software engineering, Importance of software, The evolving role of software, Software Characteristics, Software Components, Software Applications, Software Crisis, , Software Development Life Cycle, Software Process. **(Lectures 08)**

Unit II

Software Requirement Specification: Analysis Principles, Water Fall Model, The Incremental Model, Prototyping, Spiral Model, Role of management in software development, Role of matrices and Measurement, Problem Analysis, Requirement specification, Monitoring and Control.

Software-Design: Design principles, problem partitioning, abstraction, and top down and bottom up-design, Structured approach, functional versus object oriented approach, design specifications and verification, Cohesion, Coupling. **(Lectures 08)**

Unit III

Coding: Top-Down and Bottom –Up programming, structured programming, information hiding, programming style and internal documentation.

Testing: Testing principles, Levels of testing, functional testing, structural testing, test plane, test case specification, reliability assessment, software testing strategies, Verification & validation, Unit testing, Integration Testing, Alpha & Beta testing, system testing and debugging. **(Lectures 08)**

Unit IV

Software Project Management: The Management spectrum- (The people, the product, the process, the project), cost estimation, project scheduling, staffing, software configuration management, Maintenance, quality assurance, project monitoring, risk management. **(Lectures 08)**

Unit V

Software Reliability & Quality Assurance: Reliability issues, Reliability metrics, Reliability growth modeling, Software quality, ISO 9000 certification for software industry, SEI capability maturity model, comparison between ISO & SEI CMM.

CASE (Computer Aided Software Engineering): CASE and its Scope, CASE support in software life cycle, documentation, Reverse Software Engineering, Architecture of CASE environment.

(Lectures 08)

Text Books

1. Agarwal K.K., *Software Engineering*, New Age International
2. Pressman, Roger S., *Software Engineering: A Practitioner's Approach*, McGraw Hill
3. Jalote Pankaj, *Software Engineering*, Narosa.
4. Series Schaum's , *Software Engineering*, TMH

Reference Books

1. Alexis, Leon and Mathews Leon, *Fundamental of Software Engineering*, Vikas
2. Sommerville, *Software Engineering*, Ian, AWL, 2000
3. Bell, *Software Engineering for Students*, Pearson Education

*** Latest editions of all the suggested books are recommended.**

Semester IV
COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

Course Code: ECS405

L	T	P	C
3	2	0	4

Objective: To study about the solution of systems of linear equations, Solution of systems of nonlinear equations, Interpolation: Finite difference, Curve fitting, Cubic Spline and Approximation, Frequency Chart, Regression analysis, Time series and forecasting, Testing of Hypothesis.

Course Contents

Unit I

Solution of systems of linear equations – Direct method, Gauss Jordan and Gauss Elimination methods, Pivoting, Iterative methods – Jacobi and Gauss Seidel methods. **(Lectures 08)**

Unit II

Solution of systems of nonlinear equations – Bisection method, Regula -Falsi method, Newton-Raphson method, Rate of convergence, Numerical integration and differentiation: Trapezoidal and Simpson's rule, Derivatives from Newton's Forward polynomial. **(Lectures 08)**

Unit III

Interpolation: Finite difference, Newton's forward and backward interpolation formulae, Central Difference formulae – Gauss forward and backward difference formulae, Newton's divided difference Formula, Lagrange's interpolation formula. **(Lectures 08)**

Unit IV

Curve fitting, Cubic Spline and Approximation: Method of least squares, fitting of straight lines, polynomials, exponential curves etc.

Frequency Chart: Different frequency chart like Histogram, Frequency curve, Pi-chart.

Regression analysis: Linear and Non-linear regression, Multiple regression. **(Lectures 08)**

Unit V

Time Series and Forecasting: Moving averages, smoothening of curves, forecasting models and methods. Statistical Quality Controls methods

Testing of Hypothesis: Test of significance, Chi-square test, t-test, ANOVA, F-Test, Application to medicine, agriculture etc. **(Lectures 08)**

Text Books:

1. Raja Raman V, *Computer Oriented Numerical Methods*, Prentice Hall.
2. Grewal B. S., *Numerical Methods in Engineering and Science*, Khanna Publishers, Delhi.
3. Gupta S. P., *Statistical Methods*, Sultan and Sons.

Reference Books:

1. Gerald & Wheatley, *Applied Numerical Analyze*, AW.
2. Jain, Iyengar and Jain, *Numerical Methods for Scientific and Engineering Computations*, New Age Int.
3. Veerarajan T. Ramachandran T., *Theory and Problems in Numerical Method*, TMH.
4. Niyogi Pradip., *Numerical Analysis and Algorithms,* TMH.
5. Scheld Francis ., *Numerical Analysis,* TMH.
6. Balaguruswamy, *Numerical methods*, TMH.

*** Latest editions of all the suggested books are recommended.**

Semester-IV
TECHNICAL COMMUNICATION

Course code: EHM401
(Common with BPH406/BBA406/BCA406/BHM401/BCH406/BFA403)

L	T	P	C
2	0	2	3

Course Contents:

Unit I

Communication: Objectives of Communication, Need for Communication, Types of communication, written & Verbal communication, Formal and informal communication (The grapevine), upward and downward communication. **(10 Hours)**

Unit II

Business communication: Importance of written business correspondence, General principles and essentials of good commercial correspondence, Different types of commercial correspondence & their drafting, Types of Business letters, Official letters, electronic communication process. **(10 Hours)**

Unit III

Project, Thesis and Dissertation writing: Project Report, Thesis & Dissertation writing Structure of Thesis writing. **(10 Hours)**

Unit IV

Modern Technology and Communication: Globalization of Business, Role of Information Technology, Tele- communication, Internet, Tele-conferencing and Video-conferencing. **(10 Hours)**

Text Books:

1. Mishra Sunita & Muraliksishra C., *Communication Skills for Engineers* – Pearson Education, New Delhi.
2. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practice* – O.U.P. New Delhi. 2007.
3. Chabbra T N, Business Communication, Sun India Pub. New Delhi.

Reference Books:

1. Mohan Krishna & Banerji Meera, *Developing Communication Skills* – Macmillan India Ltd. Delhi.
2. Mitra Barum K., *Effective Technical Communication* – O.U.P. New Delhi. 2006.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

Semester IV
DATA BASE MANAGEMENT SYSTEM (LAB)

Course Code: ECS451

L	T	P	C
0	0	4	2

List of experiments using SQL:

1. Create Table, SQL for Insertion, Deletion, Update and Retrival using aggregating functions.
2. Write Programs in PL/SQL, Understanding the concept of Cursors.
3. Write Program for Join, Union & intersection etc.
4. Creating Views, Writing Assertions, Triggers.
5. Creating Forms, Reports etc.
6. Writing codes for generating read and update operator in a transaction using different situations.
7. Implement of 2PL concerning central algorithm.
8. Developing code for understanding of distributed transaction processing.
   Students are advised to use Developer 2000 Oracle 8+ version for above experiments.
   However, depending on the availability of Software's students may use power builder/SQL Server/DB2. for implementation.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester IV
DATA STRUCTURE USING 'C' (LAB)

Course Code: ECS452

L	T	P	C
0	0	4	2

Write Program in 'C' for following:

1. Sorting programs: Bubble sort, Merge sort, Insertion sort, Selection sort, and Quick sort.
2. Searching programs: Linear Search, Binary Search.
3. Array implementation of Stack, Queue, Circular Queue, Linked List.
4. Implementation of Stack, Queue, Circular Queue, Linked List using dynamic memory allocation.
5. Implementation of Binary tree.
6. Program for Tree Traversals (preorder, inorder, postorder).
7. Program for graph traversal (BFS, DFS).
8. Program for minimum cost spanning tree, shortest path.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)</td><td rowspan="2">ATTENDANCE (5 MARKS)</td><td rowspan="2">QUIZ (5 MARKS)</td><td rowspan="2">VIVA (10 MARKS)</td><td rowspan="2">TOTAL INTERNAL (50 MARKS)</td></tr>
<tr><td>EXPERIMENT (10 MARKS)</td><td>FILE WORK (10 MARKS)</td><td>VIVA (10 MARKS)</td></tr>
</table>

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.
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Semester IV
COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES (LAB)

Course Code: ECS453

L	T	P	C
0	0	4	2

Write programs in 'C' for following

1. To implement floating point arithmetic operations i.e., addition, subtraction, multiplication and division.
2. To deduce errors involved in polynomial interpolation.
3. Algebraic and trancedental equations using Bisection, Newton Raphson, Iterative, method of false position, rate of conversions of roots in tabular form for each of these methods.
4. To implement formulae by Bessels, Newton, Stirling, Langranges etc.
5. To implement method of least square curve fitting.
6. Implement numerical differentiation.
7. Implement numerical integration using Simpson's 1/3 and 3/8 rules, trapezoidal rule.
8. To show frequency chart, regression analysis, Linear square fit, and polynomial fit.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester IV
DISCIPLINE &GENERAL PROFICIENCY

Course Code: EGP471

L	T	P	C
0	0	0	1

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).

Semester V

COMPILER DESIGN AND CONSTRUCTION

Course Code: ECS501

L	T	P	C
3	2	0	4

Objective: To understand the working basics of a compiler, complete steps of processes that take place during compilation.

Course Contents

Unit 1

Compiler Structure: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler.

Programming Languages: High level languages, The lexical and syntactic structure of a language, Data elements, Data Structure, Operations, Assignments, Program unit, Data Environments, Parameter Transmission.

Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Regular Expressions, Transition Diagrams, Finite state Machines, Implementation of Lexical Analyzer, Lexical Analyzer Generator: LEX, Capabilities of Lexical Analyzer.

The Syntactic Specification of Programming Languages CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. **(Lectures 08)**

Unit II

Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers, Bottom–up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR), Syntax Analyzer Generator: YACC

(Lectures 08)

Unit III

Intermediate Code Generation: Different Intermediate Forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation. **(Lectures 08)**

Unit IV

Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management Error Detection and Recovery Lexical phase errors, Syntactic phase errors, Semantic errors. **(Lectures 08)**

Unit V

Code Optimization and Code Generation: Local optimization, Loop optimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection. **(Lectures 08)**

Text Books

1. Alfred V Aho , Jeffrey D. Ullman ,*Principles of Compiler Design*, Narosa
2. Aho A.V., Sethi R. and Ullman J.D, *Compiler: principle, Techniques and Tools*, AW

Reference Books

1. Holub H.C. Prentice Hall Inc *Compiler Design in C*.
2. Apple, *Modern Computer Implementation in C: Basic Design*, Cambridge press

*** Latest editions of all the suggested books are recommended.**

Semester V
COMPUTER ARCHITECTURE

Course Code: ECS502

L	T	P	C
3	2	0	4

Objective: This paper makes the students aware of the topics of computer architecture like parallel computing, processor designing principles and multiprocessor scheduling strategies etc.

Course Contents

Unit I

Introduction to Parallel computing; Parallelism in Uni-processor Systems, Parallel computer structures, Architectural Classification schemes, parallel processing applications.
Pipelining Processing: An overlapped parallelism, Instruction and Arithmetic pipelines.
(Lectures 08)

Unit II

Principles of designing pipelined processors, Internal forwarding and register tagging, Hazard detection and resolution, Job sequencing and collision prevention, Characteristics of Vector processing, Multiple vector task dispatching, SIMD array processors, Masking and Data routing.
(Lectures 08)

Unit III

SIMD Interconnection Network: Static, Dynamic networks, Cube interconnection network, Shuffle exchange and Omega Network, SIMD matrix multiplication.
Multiprocessor Architecture: Tightly and loosely coupled multiprocessors. **(Lectures 08)**

Unit IV

Multiprocessor scheduling strategies and deterministic scheduling models, Introduction to Data Flow computing and data flow Graph. Introduction to 8 Bit and 16 Bit Intel Microprocessor Architecture and Register set. **(Lectures 08)**

Unit V

Assembly language programming based on Intel 8085; Instructions: Data Transfer, Arithmetic, Logic, Branch operations, Looping Counting, Indexing, Programming Techniques, Counters and Time Delays, Stacks and Subroutines, Conditional call and Return Instructions, Advanced Subroutine Instructions. **(Lectures 08)**

Text Books

1. Hwang and Briggs, *Computer Architecture and parallel processing*, McGraw Hill
2. Peterson & Heresy, *Quantitative approach to computer architecture*, Morgan Kaufman
3. Hwang, *Advanced Computing Architecture*, McGraw Hill

References Books

1. Quin, *Parallel Computing, Theory and Practice*, McGraw Hill
2. Tabak Daniel, *Advanced Microprocessor*, McGraw Hill
3. Hall D.V, *Microprocessor and Interfacing, Program and hardware*, TMH
4. Goankar R.S., *Microprocessor architecture, programming and application with the 8085,* Pen Ram International.

*** Latest editions of all the suggested books are recommended.**

Semester V
ANALYSIS AND DESIGN OF ALGORITHMS

Course Code: ECS503

L	T	P	C
3	2	0	4

Objective: The objective of this paper is to give the Technical Knowledge to the students about designing of algorithms and their analysis.

Course Contents

Unit I

Introduction: Algorithm Design paradigms- motivation, concept of algorithmic efficiency, run time analysis of algorithms, Asymptotic Notations. Divide and conquer: Structure of divide-and-conquer algorithms: examples; Binary search, quick sort, Analysis of divide and conquer. **(Lectures 08)**

Unit II

Greedy Method: Overview of the greedy paradigm examples of exact optimization solution (minimum cost spanning tree), approximate solution (Knapsack problem), Single source shortest paths. **(Lectures 08)**

Unit III

Dynamic Programming: Overview, difference between dynamic programming and divide and conquer, Applications: Shortest path in graph, Matrix multiplication, Traveling salesman Problem, longest Common sequence. **(Lectures 08)**

Unit IV

Graph searching and Traversal: Overview, Traversal methods (depth first and breadth first search).Back tracking: Overview, 8-queen problem, and Knapsack problem.

(Lectures 08)

Unit V

Brach and Bound: LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Traveling Salesman Problem. Computational Complexity: Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, examples. **(Lectures 08)**

Text Books:

1. Coremen Leiserson etal, *Introduction to Algorithms*, PHI
2. Sahani Horowitz *Fundamentals of Computer Algorithms*, Golgotia

Reference Books:

1. Bratley Brassard *Fundamental of Algorithms*, PHI
2. Goodrich etal M T, *Algorithms Design* , John Wiley
3. Aho etal A V., *The Design and analysis of Algorithms,* Pearson Education

*** Latest editions of all the suggested books are recommended.**

Semester V
COMPUTER NETWORK

Course Code: ECS504

L	T	P	C
3	2	0	4

Objective: To familiarize the students with the layered design and protocols of computer networks, including the Internet.

Course Contents

Unit I

Introduction Concepts: Goals and Applications of Networks, Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics , ISDN.

(Lectures 08)

Unit II

Medium Access Sub Layer: Medium Access sub layer - Channel Allocations- ALOHA protocols, Error – detection and correction – Parity – LRC – CRC – Hamming code – flow Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

(Lectures 08)

Unit-III

Network Layer: Internet works – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers

(Lectures 08)

Unit IV

Transport Layer: Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of Services (QoS) – Integrated Services.

(Lectures 08)

Unit V

Application Layer: Domain Name Space (DNS), File Transfer, Access and Management, Electronic mail, Virtual Terminals, WWW – Security – Cryptography.

(Lectures 08)

Text Books:

1. Forouzen, *Data Communication and Networking*, TMH
2. Achyut S Godbole*, Data Communications & Networks*, TMH
3. Behrouz A.Forouzan*, TCP/IP Protocol Suit*,

Reference Books:

1. Stallings W. *Data and Computer Communication*, Macmillan Press
2. A.S. *Computer Networks*, Prentice Hall India, 1997.
3. Keshav S., *An Engineering Approach on Computer Networking*, Addison Wesley
4. Larry L.Peterson and Peter S. Davie*, Computer Network,* Harcourt Asia Pvt. Ltd.

*** Latest editions of all the suggested books are recommended.**

Semester-V
TECHNICAL WRITING

Course code: EHM501
(Common with BPH506/BHM501)

L	T	P	C
2	0	2	3

Course Contents:

Unit I

Forms of Technical Communication: Report writing, Definition and characteristics, Steps towards report writing, Structure, style of Report writing, Types & forms of Reports, Presentation of Reports, Importance of Report writing. **(10 Hours)**

Unit II

Technical Paper writing: Definition and purpose, Essentials of a good technical paper/Article, Scientific Article writing, Difference between Technical paper/Article and scientific article, Methods of writing technical paper & Scientific article. **(10 Hours)**

Unit III

Technical Proposal: Definition and meaning of Technical Proposal, Significance of Proposal, Characteristics of a good Proposal, Format of Proposal, Uses of Proposals. **(10 Hours)**

Unit IV

Writing Skills: Reporting events, Writing newspaper reports, Essentials of essay writing –writing an essay of about 300 words on a given topic. Bio-Data Making, Writing of CV & Resumes, Difference between CV and Resume, Writing Job application etc. **(10 Hours)**

Text Books:

1. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practice* – O.U.P. New Delhi. 2007.

Reference Books:

1. Monippally Matthukutty M., *Business Communication Strategies* – Tata- Mc Graw Hill Publications Company, New Delhi.
2. Mohan K. & Sharma R.C., *Business Correspondence of Report Writing* –TMH, New Delhi.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

Semester- V
PRINCIPLES OF MANAGEMENT

Course Code: EHM502

L	T	P	C
3	2	0	4

Objective: To impart knowledge about management policies, planning, implementation & methods to grow an organization.

Course Contents

Unit I **(Lectures 08)**

Planning: Planning, types of plans, major steps in managerial planning, Organizing, nature an purpose, process of organization, Departmentation. Coordination, nature purpose and process of coordination. Supervision, Leadership: purpose, functions and its types.

Unit II **(Lectures 08)**

Communication, process of communication, effective communication, barriers to communication.
Motivation: What is motivation, factors involved, theories, motives in organization.

Unit III **(Lectures 08)**

Controlling-Nature and purpose: Management of change: forces of change, strategies of change, resistance to change.

Unit IV **(Lectures 08)**

Human elements in management: Factors in individual behaviour, Perception, Learning, Personality development, Interpersonal relationship & group behaviour, Conflict management Stress management, sources of stress, consequences, strategies of stress management.

Text Books

1. *"Principles and practices of management* ", CB Gupta ,
2. "*M. Principles of management*", Prasad, L,

Reference Books:

1. "*H. Management: A Global Perspective*", Koontz, H & Weihrich.
2. "*Organizational Behaviour*", Robbins, S. P.

*** Latest editions of all the suggested books are recommended.**

Semester V
COMPILER DESIGN (LAB)

Course Code: ECS551

L	T	P	C
0	0	4	2

List of Experiments:

1. Simulation of a Finite state Automata to recognize the tokens of various control statements.
2. Simulation of a Finite state machine to distinguish among Integers, Real Numbers & Numbers with Exponents.
3. Program in LEX tool to recognize the tokens and to return the token found for a C like Language
4. Parsing of arithmetic and algebraic expressions and equations.
5. Use of YACC tool to parse the statements of C like Language.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester V
ANALYSIS AND DESIGN OF ALGORITHMS (LAB)

Course Code: ECS552

L	T	P	C
0	0	4	2

Write Programs in C/C++ for the following

1. Creation of a binary search tree and insertion & deletion.
2. Creation of a Red Black tree and all the associated operations
3. Implementing an AVL tree and all the associated operations
4. Multiplication of two matrices using Strassen's Matrix Multiplication
5. Solving Knapsack problem.
6. Implementing shortest path algorithms (Dijkastra's and Bellman Algorithm).
7. Finding the minimum cost Spanning Tree in a connected graph.
8. Solving 8 Queen's problem.
9. Finding the number of connected components in a Graph.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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<tr><td>EXPERIMENT (10 MARKS)</td><td>FILE WORK (10 MARKS)</td><td>VIVA (10 MARKS)</td></tr>
</table>

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester V
COMPUTER NETWORK (LAB)

Course Code: ECS553

L	T	P	C
0	0	4	2

List of Experiments:

1. Implementation of LAN using star topology and connectivity between two computers using crossover UTP5 cable.
2. To establish internet connectivity using dial up modem on windows system.
3. Study of network components such as Preparation of various cables, information attenuator, hubs, switches, bridges, routers, gateways, color codes of AT and T (2 Practicals)
4. Study of MODEM Trainer kit
5. Study of RAM for MODEM
6. Study of CDMA Trainer
7. Study of GSM Trainer

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester V
INDUSTRIAL TRAINING
(PRESENTATION BASED ON INDUSTRIAL TRANING DONE AFTER THE IV SEMESTER EXAMINATION IN SUMMER)

Course Code: ECS591

L	T	P	C
0	0	0	2

Students will attend Industrial training of four weeks in any industry or reputed organization after the IV semester examination in summer vacation. The evaluation of this training shall be included in the V semester evaluation.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the IV semester and shall be the nodal officer for coordination of the training.

Students will also be required to prepare an exhaustive technical report of the training undertaken during the V semester which will be duly signed by the officer under whom training was taken in the industry/ organization. The covering format shall be signed by the concerned office in-charge of the training in the industry. The officer-in-charge of the trainee would also give his rating of the student in the standard University format in a sealed envelope to the Director of the college.

The student at the end of the V semester will present his report about the training before a committee constituted by the Director of the College which would be comprised of at least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Director. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately in a sealed envelope to the Director.

The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned.

Not more than three students would form a group for such industrial training/ project submission.

The marking shall be as follows.

Internal: 50 marks
By the Faculty Guide - 25 marks
By Committee appointed by the Director – 25 marks

External: 50 marks
By Officer-in-charge trainee in industry – 25 marks
By External examiner appointed by the University – 25 marks

Semester V
DISCIPLINE &GENERAL PROFICIENCY

Course Code: EGP571

L	T	P	C
0	0	0	1

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).

Semester VI
ARTIFICIAL INTELLIGENCE

Course Code: ECS601

L	T	P	C
3	2	0	4

Objective: To familiarize the students with the technique of artificial intelligence to the computer which is a new area of research.

Course Contents

Unit I

General issues and overview of AI, AI Techniques, AL problems, AI Techniques, importance and areas of AI, problem solving state space search-DLF, BFS Production system, problem characteristics. Heuristic Search Techniques: Generate and Test, Hill Climbing, Best First Search, Problem reduction, Constraint satisfaction- Cryptarithmetic and problems. **(Lecturer 08)**

Unit II

Knowledge representation & mapping, approaches to knowledge representation, issues in knowledge representation, Representing simple facts in logic, representing instance and relationships, Resolution and natural deduction Representing knowledge using rules, Procedural v/s Declarative knowledge, Logic programming, Forward v/s Backward chaining, Matching & control knowledge. **(Lectures 08)**

Unit III

AI programming language: Prolog- objects, relationships, facts, rules and variables, Prolog: Syntax and data structures, representing objects & relationships by using "trees" and "lists", use of cut, I/O of characters and structures. Symbolic reasoning under uncertainty: Introduction to monotonic reasoning, Logics for Nonmonotonic reasoning, implementation issues, implementation: DFS & BFS.

(Lectures 08)

Unit IV

Slot and Filler Structures: Semantic nets, frames, conceptual dependency, scripts, CYC Natural languages and NLP, Syntactic processing parsing techniques, semantic analysis case grammar, augmented transition net, discourse & pragmatic processing, translation. **(Lectures 08)**

Unit V

Definition and characteristics of Expert System, representing and using domain knowledge, Expert system shells Knowledge Engineering, knowledge acquisition, expert system life cycle & expert system tools, MYCIN & DENDRAL examples of expert system. **(Lectures 08)**

Text Books

1. Rich & Knight, *Artificial Intelligence*, TMH.
2. Nillson Harcourt Asia & Morgan, *Principles of Artificial Intelligence.*

Reference Books

1. Cloksin & Mellish, *Programming In Prolog*, Narosa Publishing House
2. Janakiraman, *Foundation of Artificial Intelligence & Expert System*, Sarukesi & Gopal Krishnan Macmillan.

*** Latest editions of all the suggested books are recommended.**

Semester VI
JAVA PROGRAMMING

Course Code: ECS602

L	T	P	C
3	2	0	4

Objective: To make the students aware of the basics of internet. To provide a deep insight into Object Oriented Programming through Java. To use rich inbuilt set of classes to develop GUI systems. To master internet programming through Applets and JSP.

Course Contents

Unit I

Core Java: Introduction, Operator, Data type, Variable, Arrays, Control Statements, Methods & Classes, Inheritance, Package and Interface, Exception Handling, Multithread programming, I/O, Java Applet, String handling, Networking, Event handling, Introduction to AWT, AWT controls, Layout managers, Menus, Images, Graphics. **(Lectures 08)**

Unit II

Java Swing: Creating a Swing Applet and Application, Programming using Panes, Pluggable Look and feel, Labels, Text fields, Buttons, Toggle buttons, Checkboxes, Radio Buttons, View ports, Scroll Panes, Scroll Bars, Lists, Combo box, Progress Bar, Menus and Toolbars, Layered Panes, Tabbed Panes, Split Panes, Layouts, Windows, Dialog Boxes, Inner frame. **(Lectures 08)**

Unit III

JDBC: The connectivity Model, JDBC/ODBC Bridge, java.sql package, connectivity to remote database, navigating through multiple rows retrieved from a database. **(Lectures 08)**

Unit IV

Java Beans: Application Builder tools, The bean developer kit(BDK), JAR files, Introspection, Developing a simple bean, using Bound properties, The Java Beans API, Session Beans, Entity Beans, Introduction to Enterprise Java beans (EJB), Introduction to RMI (Remote Method Invocation) A simple client-server application using RMI. **(Lectures 08)**

Unit V

Java Servlets: Servlet basics, Servlet API basic, Life cycle of a Servlet, Running Servlet, Debugging Servlets, Thread-safe Servlets, HTTP Redirects, Cookies, Introduction to Java Server pages (JSP). **(Lectures 08)**

Text Books

1. Margaret Levine Young, *The Complete Reference Internet*, TMH
2. Naughton, Schildt, *The Complete Reference JAVA2*, TMH

References Books

1. Balagurusamy E, *Programming in JAVA*, TMH
2. Dustin R. Callway *Inside Servlets*, Addison Wesley
3. Mark Wutica, *Java Enterprise Edition,* QUE
4. Steven Holzner, *Java2 Black Book*, Dreamtech

*** Latest editions of all the suggested books are recommended.**

Semester VI
COMPUTER GRAPHICS

Course Code: ECS603

L	T	P	C
3	2	0	4

Objective: To understand the basics of Computer Graphics, Visual Data processing, various mathematical concepts used in displaying graphics. Focusing on various algorithms used for manipulating images. A light introduction to various animation techniques.

Course Contents

Unit I

Introduction, Application

Areas of Computer Graphics, overview of graphics systems. Graphics primitives: video-display devices, and raster-scan systems, random scan systems, Plasma displays, LCD, Plotters, printers, graphics monitors and workstations and devices, input techniques. **(Lectures 08)**

Unit II

Output Primitives: Points and lines, line drawing algorithms, circle and ellipse algorithms.

Filled Area Primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

(Lectures 08)

Unit III

2-D Geometrical Transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

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. **(Lectures 08)**

Unit IV

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.

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. **(Lectures 08)**

Unit V

Visible Surface Detection Methods: Classification, back-face detection, depth buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

Computer Animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications **(Lectures 08)**

Text Books

1. Hearn Donald and Pauline Baker M., *Computer Graphics C Version*, Pearson Education
2. Foley C, VanDam, Feiner and Hughes*, Computer Graphics Principles & Practice*, Pearson Education.
3. Harrington Steven, *Computer Graphics*, TMH.

Reference Books:

1. Hearn Donald and Pauline Baker M.*, Computer Graphics*, PHI/Pearson Education.
2. Zhigand xiang, Roy Plastock, Schaum's outlines, *Computer Graphics,* Tata Mc-Graw hill edition.
3. Rogers David F, *Procedural Elements for Computer Graphics*, Tata Mc Graw hill.
4. Neuman and Sproul, *Principles of Interactive Computer Graphics*, TMH.
5. Govil Shalini, P*rinciples of Computer Graphics*, Pai, 2005, Springer.
6. Harrington Steven, *Computer Graphics*, TMH.

*** Latest editions of all the suggested books are recommended.**

Semester VI
DISTRIBUTED SYSTEM

Course Code: ECS608

L	T	P	C
3	2	0	4

Objective: To understand the basic environment of distributed system and working of Client server computing.

Course Contents

Unit I

Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. System Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks, Causal ordering of messages, global state, termination detection. Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem. **(Lectures 08)**

Unit II

Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms. Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system. **(Lectures 08)**

Unit III

Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study.
Security: Overview of security techniques, Cryptographic algorithms, Digital signatures Cryptography pragmatics, Case studies: Needham Schroeder, Kerberos, SSL & Millicent. Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System. **(Lectures 08)**

Unit IV

Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control. Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data. **(Lectures 08)**

Unit V

Distributed Algorithms: Introduction to communication protocols, Balanced sliding window protocol, Routing algorithms, Destination based routing, APP problem, Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm. **(Lectures 08)**

Text Book

1.Singhal & Shivaratri, *Advanced Concept in Operating Systems*, McGraw Hill

Reference Books

1. Coulouris, Dollimore, Kindberg, *Distributed System: Concepts and Design,* Pearson Ed.
2. Tel Gerald, *Distributed Algorithms*, Cambridge University Press

*** Latest editions of all the suggested books are recommended.**

Semester VI
E-COMMERCE AND ERP SYSTEM

Course Code: ECS605

L	T	P	C
3	2	0	4

Objective: To understand the modern day e-commerce applications and how they are implemented physically. To understand the working of various protocols used in e-commerce applications.

Course Contents

Unit I

Introduction of E-Commerce, Brief history of E-Commerce, Advantages and disadvantages, Type of E-commerce, E-business vs. E-commerce, Industry Framework. Network Infrastructure for E-Commerce, Component of I- way, Network Access Equipment, Broad band Telecommunication, ISDN. Introduction of Mobile commerce, Mobile computing framework, Wireless application protocol, Mobile Information devices, Mobile computing application. **(Lectures 08)**

Unit II

Introduction of WWW and Internet, Security issues on web, Introduction to firewall, Types of firewall, Advantage and disadvantage of firewall. Client server network security, Client server security threats, client server security schema. Introduction to Network Security, Cryptography, Secret key cryptography, Public key cryptography, DES. **(Lectures 08)**

Unit III

Electronic payment systems, types of electronic payment systems, Digital tokens, smart cards, credits cards, magnetic strip cards, E checks, online banking, Risk and electronic payment system Introduction and application of EDI, legal, security and privacy issues, EDI and e- commerce, Value added network **(Lectures 08)**

Unit IV

Introduction of ERP, Evoluation of ERP, ERP Definition, Reason for the growth of ERP market, the advantage of ERP, Integrated Management Information, Business modeling, Integrated Data model. **(Lectures 08)**

Unit V

ERP & related technologies- Business process re-engineering, Management information system, Decision support system, Executive information system, Data warehousing, Data mining, OLAP, Supply chain management.

ERP modules, Benefits of ERP, ERP implementation life cycle, future description of ERP **(Lectures 08)**

Text Books

1. Kalakota, *Frontiers of E-Commerce,* Addition Wesley long man Publishers 1999.
2. Leon Alexis, *Enterprise Resource Planning*, TMH, 2000

Reference Books

1. Sadagopan S. *Enterprise Resource Planning*, Tata McGraw Hill, 1999.
2. Bajaj Kamlesh & Nag Debjani, *E-Commerce: The cutting edge of Business*, TMH, 2000.

Semester VI
REAL TIME OPERATING SYSTEM

Course Code: ECS606

L	T	P	C
3	2	0	4

Objective: To impart the basic knowledge among the students about Real Time System. Through which they can understand the concepts, along with that it has various case studies which will be helpful for its better understanding.

Course Contents

Unit I

Introduction to Real Time Systems, Priorities, Embedded Systems, Task, Classification & Requirements, Deadlines, Soft Real Time System, Hard Real Time System. **(Lectures 08)**

Unit II

Firm Real Time Systems, Introduction to Real Time Operating Systems, Task Management, Inter Process Communication, Case Studies of Maruti II, HART OS, VRTX etc.

(Lectures 8)

Unit III

Characterizing Real Time Systems and Task, Task Assignment & Scheduling Theory, Fixed and Dynamic Priority Scheduling Unprocessed (RM and EDF), Multiprocessor (Utilization Balancing, Next-fit for RM & Bin-Packing Assignment for EDF) Scheduling. **(Lectures 08)**

Unit IV

Programming Languages and Tools, Real Time Databases Real Time Communication, FDDI, Specification and Verification using Duration Calculus, Flow Control, Protocols for Real Time (VTCSMA, Window, IEEE 802.3, IEEE 802.4, IEEE 802.5, Stop and Go Protocol, Media Access Protocol). **(Lectures 08)**

Unit V

Fault, Fault Classes, Fault Tolerant Real Time System, Clocks, Clock Synchronization, Issues in Real Time Software Design. **(Lectures 08)**

Text Books

1. Krishna, C.M., *Real Time Systems*, McGraw Hill
2. Jane W.S. Liu., *Real Time Systems*, Pearson Education Asia

Reference Books

1. Levi and Agarwal, *Real Time Systems*, McGraw Hill
2. Mathi & Joseph, *Real Time System: Specification, Validation & Analysis*, PHI

*** Latest editions of all the suggested books are recommended.**

Semester VI
SOFT COMPUTING

Course Code: ECS607

L	T	P	C
3	2	0	4

Objective: To the need of soft computing which includes Neural Network and Fuzzy Logic. This subject is ideal for working professional engineers, medical / biology majors & anyone with a specialist background. Here the fundamental understanding of emerging field of fuzzy neural network and its application into various areas is covered.

Course Contents

Unit I

Neural Networks: History, overview of biological Neuro - system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning ANN training Algorithms-perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perception Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks. **(Lectures 08)**

Unit II

Fuzzy Logic: Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function; Fuzzy rule generation. **(Lectures 08)**

Unit III

Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations. **(Lectures 08)**

Unit IV

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations. Classical Logic, Multi-valued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges. **(Lectures 08)**

Unit V

Uncertainty based Information: Information & Uncertainty, Non specificity of fuzzy & crisp sets, Fuzziness of Fuzzy Sets. **(Lectures 08)**

Text Books

1. Simon Haykin*, Neural Networks.*
2. Kosko *Neural Networks*.
3. Klir & Yuan, *Fuzzy Logic & Fuzzy sets*,

Reference Books:

1. Kazuo Tanaka., *An Introduction to Fuzzy Logic for Practical Applications*,
2. Laurene V. Fausett, *Fundamental of Neural Networks*,

*** Latest editions of all the suggested books are recommended.**

Semester VI
MICROPROCESSOR & ITS APPLICATION

Course Code: EEC606

L	T	P	C
3	2	0	4

Objective: To learn about Microprocessor which is in the core of a computer system. The objective of the paper is to give the basic knowledge of different micro processors, used in the computer.

Course Contents

Unit I **(Lectures 08)**

Introduction to Microprocessor: 8085 Evolution of Microprocessor, Register Structure, ALU, Bus Organization, Timing and Control, instruction set. Architecture of 16-bit Microprocessors: Architecture of 8086; (Bus Interface Unit, Execution unit) Register Organization, Bus operation, Memory segmentation.

Unit II **(Lectures 08)**

Assembly Language Programming: Addressing Modes and instruction set of 8086, Arithmetic and Logic instructions, Program Control Instructions (jumps, conditional jumps, subroutine call) Loop and string instructions, Assembler Directives.

Unit III **(Lectures 08)**

CPU Module: Signal Description of pins of 8086 and 8088, Clock generator, Address and Data bus Demultiplexing, Buffering Memory Organization, Read and Write cycle Timings, Interrupt Structures, Minimum Mode, and Maximum Mode Operation.

Unit IV **(Lectures 08)**

Peripheral Interfacing: Programmed I/O, Interrupt Driven, I/O, DMA, Parallel I/O, (8255-PPI, Parallel port), 8253/8254 programmable Timer/Counter Interfacing with ADC.

Unit V **(Lectures 08)**

Peripheral Interfacing (Contd.): 8259 Programmable Interrupt controller, 8237 DMA controller Concept of Advanced 32 bit Microprocessors: Pentium Processor.

Text Books:

1. "*Microprocessor Architecture, Programming, and Applications with the 8085*", Gaonkar, Ramesh S., Pen Ram International Publishing.
2. "*Advanced Microprocessors and Peripherals: Architecture Programming and Interfacing*", Ray, A.K. & Burchandi, K.M. Tata McGraw Hill.
3. "*Microprocessors Interfacing",* Hall D.V., Tata McGraw Hill.
4. *"Microprocessors and Microcontrollers*", B.P. Singh & Renu Singh, New Age International.

Reference Books:

1. "*Microcomputer Systems: The 8086/8088 Family*", Liu and Gibson G.A., Prentice Hall (India).
2. "*INTEL microprocessors*", Brey, Barry B., Prentice Hall (India).
3. "*Advanced Microprocessor & Interfacing*", Ram B., Tata McGraw Hill.
4. "*Microprocessors and Interfacing & Application*s", Renu Singh & B.P. Singh, New Age International.

*** Latest editions of all the suggested books are recommended.**

Semester-VI
COMMUNICATION TECHNIQUE

Course code: EHM601
(Common with BPH606/BBA603/BCA604/BCH606)

L	T	P	C
2	0	2	3

Course Contents:

Unit I

Oral Communication: Principles of effective oral communication, Features, Vitals of communication, Interpersonal communication, Persuasive communication. **(10 Hours)**

Unit II

Presentation Strategies: Purpose, Audience & Locale, Organizing contents, Preparing outlines. Audio- Visual aids, Body Language, Voice dynamics. **(10 Hours)**

Unit III

Listening Skills: The Listening process, Hearing & listening, Types of listening, Listening with a purpose, Barriers to listening, Telephonic conversation. **(10 Hours)**

Unit IV

Speaking Skills: Improving voice & speech, Art of public speaking, Using visual aids, Job interview being interviewed by the media, Dealing with the boss. Dealing with subordinates, How to run a meeting. **(10 Hours)**

Text Book:

1. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practice* – O.U.P. New Delhi. 2007.

Reference Books:

1. Ruther Ford A., *Basic Communication Skills* – Pearson Education, New Delhi.
2. Mitra Barum K., *Effective Technical Communication* – O.U.P. New Delhi. 2006.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

Semester VI
ARTIFICIAL INTELLIGENCE (LAB)

Course Code: ECS651

L	T	P	C
0	0	4	2

List of Experiments:

1. Write a LISP Program to solve the water-jug problem using heuristic function.
2. Create a compound object using Turbo Prolog.
3. Write a Prolog Program to show the advantage and disadvantage of green and red cuts.
4. Write a prolog program to use of BEST-FIRST SEARCH applied to the eight puzzle problem.
5. Implementation of the problem solving strategies: Forward Chaining, Backward Chaining, Problem Reduction.
6. Write a Lisp Program to implement the STEEPEST-ASCENT HILL CLIMBING.
7. Write a Prolog Program to implement COUNTE PROPAGATION NETWORK.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)</td><td rowspan="2">ATTENDANCE (5 MARKS)</td><td rowspan="2">QUIZ (5 MARKS)</td><td rowspan="2">VIVA (10 MARKS)</td><td rowspan="2">TOTAL INTERNAL (50 MARKS)</td></tr>
<tr><td>EXPERIMENT (10 MARKS)</td><td>FILE WORK (10 MARKS)</td><td>VIVA (10 MARKS)</td></tr>
</table>

External Evaluation (50 marks)

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VI
JAVA PROGRAMMING (LAB)

Course Code: ECS652

L	T	P	C
0	0	4	2

List of Experiments:

1. Write a program in Java for illustrating, overloading, over riding and various forms of inheritance.
2. Write programs to create packages and multiple threads in Java.
3. Write programs in Java for event handling Mouse and Keyboard events.
4. Using Layout Manager create different applications.
5. Write programs in Java to create and manipulate Text Area, Canvas, Scroll Bars, Frames and Menus using swing/AWT.
6. Using Java create Applets.
7. Use Java Language for Client Server Interaction with stream socket connections.
8. Write a program in java to read data from disk file.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VI
COMPUTER GRAPHICS (LAB)

Course Code: ECS653

L	T	P	C
0	0	4	2

List of Experiments:

Write program in 'C' language

1. Write a program to draw a line using DDA algorithm.
2. Write a program for implementing Bresenham's algorithm for line generation.
3. Write a program for generation of circle.
4. Write a program to demonstrate Cohen-Sutherland line clipping method.
5. Write a program to implement Sutherland-Hodgeman polygon clipping algorithm.
6. Write a program to rotate a triangle. (By asking the user to input the coordinates of the Triangle and the angle of rotation).
7. Write a program to perform one point perspective projection of an object.
8. Write a program to implement Depth-Buffer method to display the visible surfaces of a given polyhodron.
9. Write a program to implement 3-D rotation of an object.
10. Write a program to draw polyline using any algorithm.
11. Write a program to draw a Bezier curve and surface.

Note: Students are advised to use C, C++ language for writing program; Use of open GL is desirable.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)</td><td rowspan="2">ATTENDANCE (5 MARKS)</td><td rowspan="2">QUIZ (5 MARKS)</td><td rowspan="2">VIVA (10 MARKS)</td><td rowspan="2">TOTAL INTERNAL (50 MARKS)</td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VI
DISCIPLINE &GENERAL PROFICIENCY

Course Code: EGP671

L	T	P	C
0	0	0	1

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).

Semester VII
CLOUD COMPUTING

Course Code: ECS701

L	T	P	C
3	2	0	4

Objective: To understand the basics of cloud environment.

Course Contents

Unit I

Cloud Computing - A true paradigm shift: Introduction, What is Cloud Computing, Existing Usage of Cloud Computing, New paradigm in the Cloud, Other Cloud Applications.

Cloud Computing Architectural Framework: Cloud Benefits, Business scenarios, Cloud Vocabulary, Essential Characteristics of Cloud Computing, Cloud Deployment Models, Cloud Service Models, Multi- Tenancy, Approaches to Create a Barrier between the Tenants.

(Lectures 08)

Unit II

Vendor Lock-in and Efforts at Standardization: Need of Migration, Preventing Vendor Lock-in, Comparison Chart

Cloud Software: Scripting Languages, Eucalyptus, Cloud-Optimized Linux, Abiquo, etc., The Problem of Metering, Cloud Broker. **(Lectures 08)**

Unit III

Cloud Economics and Capacity Management: Restricted Choices, Capacity Planning, Queuing and Response Time, Evidence Based Decision Making, Instrumentation (Measuring Resource Consumption), Bottlenecks, Key Volume Indicators. **(Lectures 08)**

Unit IV

Cloud Reliability, Fault Tolerance and Response Time: Business Continuity Management, System Reliability, Human Factors, Case Studies on Designing for Reliability, Concept of Fault Tolerance, Response Time.

Internet Cloud Security: Introduction, Potential Threats, Security as a service by Cloud Providers, Fraud Theory and Intellectual Property, Security Engineering. **(Lectures 08)**

Unit V

Case Studies on Cloud Computing Applications: Amazon's Cloud Services (AWS), Windows Azure, Cloud Software for Private Banking. **(Lectures 08)**

Text Books:

1. *Implementing and Developing Cloud Computing Applications* - by David E.Y. Sarna (CRC Press, Taylor & Francis Group)
2. *Cloud Computing Stratigies* - Dimitris N. Chorafas (CRC Press, Taylor & Francis Group)

Reference Books:

1. *Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory in Practice)* - by Tim Mather

*** Latest editions of all the suggested books are recommended.**

Semester VII
LINUX INTERNALS

Course Code: ECS702	L	T	P	C
	3	2	0	4

Objective: To make students familiar with Linux operating system.

Course Contents

Unit I

Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, more, less, creating and viewing files, using cat, file comparisons, View files, disk related commands, checking disk free spaces. Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down. **(Lectures 08)**

Unit II

Essential linux commands Understanding shells, Processes in linux process fundamentals, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority, scheduling of processes at command, batch commands, kill, ps, who, sleep, Printing commands, grape, fgrep, find, sort, Cal, banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc. Mathematical commands- bc, expr, factor, units. vi editor. **(Lectures 08)**

Unit III

Shell programming Basic of shell programming, Various types of shell, shell programming in bash conditional and looping statements, case statements, parameter passing and arguments, Shell variables, shell keywords, Creating Shell programs for automate system tasks and report printing, use of grip in shell, ask programming. **(Lectures 08)**

Unit IV

System administration Common administrative tasks, identifying administrative files – configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performance file security & Permissions, becoming super user using suggesting system information - host name, disk partitions & sizes, users, kernel. Backup and restore files.

(Lectures 08)

Unit V

Basic networking administration Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet LAN, configuring host computers, checking Ethernet connecting, connecting to internet, administration in a networked environment,

common networking administrative tasks, the network file system, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands a TCP/IP networks, DNS services, routing using Linux, SLIP & PPP services, UUCP. **(Lectures 08)**

Texts Books

1. Tackett Jack, *Using Linux*, David Gunter, PHI
2. Negus Christopher, *Red Hat Linux7.X Bible*, IDG Books India Ltd.

References Books

1. Nicholas Wells, *Linux Installation and Administration Course Technology*, Vikas Publishing,
2. Das Sumitaba*, Unix*
3. Kanetkar Yashwant, *Nix Shell Programming*, BPB Publications,
4. Unleashed Techmedia, *Red Hat Linux*, BPB Publications

*** Latest editions of all the suggested books are recommended.**

Semester VII
SOFTWARE TESTING

Course Code: ECS703

L	T	P	C
3	2	0	4

Objective: Software testing is an evolving area in research. The objective of this paper is to give the details of software testing to students so that they can prepare themselves for this new area.

Course Contents

Unit I

What is software testing and why it is so hard?, Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitations of Testing, No absolute proof of correctness. **(Lectures 08)**

Unit II

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique. **(Lectures 08)**

Unit III

Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing. **(Lectures 08)**

Unit IV

Reducing the number of test cases: Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, Slice based testing.

Testing Activities: Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing. **(Lectures 08)**

Unit V

Object Oriented Testing: Issues in Object Oriented Testing, Class Testing, GUI Testing, Object Oriented Integration and System Testing.

Testing Tools: Static Testing Tools, Dynamic Testing Tools, Characteristics of Modern Tools.

(Lectures 08)

Text Books

1. Perry William, *Effective Methods for Software Testing*, John Wiley & Sons, New York.
2. Tamres Louise, *Software Testing*, Pearson Education Asia, 2002
3. Robert V. Binder, *Testing Object-Oriented Systems-Models, Patterns and Tools*, Addison Wesley, 1999.

Reference Books

1. Cem Kaner, Jack Falk, *Testing Computer Software*, Nguyen Quoc, Van Nostrand Reinhold.
2. Aggarwal K.K. & Singh Yogesh, *Software Engineering* , New Age International Publishers, New Delhi, 2005
3. Boris Beizer*, Software Testing Techniques,* Van Nostrand Reinhold, New York, 1990.
4. Boris Beizer, *Black-Box Testing – Techniques for Functional Testing of Software and Systems*, John Wiley & Sons Inc., New York, 1995.

*** Latest editions of all the suggested books are recommended.**

Semester-VII
CORPORATE COMMUNICATION

Course code: EHM701 (Common with BPH707)

L	T	P	C
2	0	2	3

Course Contents:

Unit I

Corporate behavior, Corporate expectation, Office etiquettes, Telephonic conversation & etiquette. **(10 Hours)**

Unit II

Communication: Press communication, press-note, notification, e-mail, inviting tenders, writing advertisements, writing notices, Agenda for the meeting, writing minutes of the meeting. **(10 Hours)**

Unit III

Interview skills: Concept & Process, Preparing for the Interview, Dressing sense, Self-awareness – Meaning & scope, Self- image, self-concept, self confidence. **(10 Hours)**

Unit IV

Group Discussion (G.D), Tips and Style. **(10 Hours)**

Recommended Books:

1. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practice* – O.U.P. New Delhi. 2007.
2. Newstron John W., *Organizational Behaviour: Human Behaviour at work* – Tata McGraw Hill.
3. Luthans Fred, *Organizational Behaviour* – Tata McGraw Hill.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

Semester VII
CLOUD COMPUTING (LAB)

Course Code: ECS751

L	T	P	C
0	0	4	2

List of Experiments:

1. Case Study of Amazon Web Services.
2. Study of Google Apps for Cloud.
3. Mini Project-Implementation of a Private Cloud using Microsoft technologies.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)</td><td rowspan="2">ATTENDANCE (5 MARKS)</td><td rowspan="2">QUIZ (5 MARKS)</td><td rowspan="2">VIVA (10 MARKS)</td><td rowspan="2">TOTAL INTERNAL (50 MARKS)</td></tr>
<tr><td>EXPERIMENT (10 MARKS)</td><td>FILE WORK (10 MARKS)</td><td>VIVA (10 MARKS)</td></tr>
</table>

External Evaluation (50 marks)

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VII
LINUX (LAB)

Course Code: ECS752

L	T	P	C
0	0	4	2

Course Contents

Use of different commands cd, ls, cp, md, rm, mkdir, rmdir, more, less, creating and viewing files, using cat, file comparisons, View files, disk related commands, checking disk free spaces.

batch commands, kill, ps, who, sleep, Printing commands, grape, fgrep, find, sort, Cal, banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc. Mathematical commands- bc, expr, factor, units. vi editor

Shell Programming conditional and looping statements, case statements, parameter passing and arguments, Shell variables, shell keywords, Creating Shell programs

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)</td><td rowspan="2">ATTENDANCE (5 MARKS)</td><td rowspan="2">QUIZ (5 MARKS)</td><td rowspan="2">VIVA (10 MARKS)</td><td rowspan="2">TOTAL INTERNAL (50 MARKS)</td></tr>
<tr><td>EXPERIMENT (10 MARKS)</td><td>FILE WORK (10 MARKS)</td><td>VIVA (10 MARKS)</td></tr>
</table>

External Evaluation (50 marks)

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VII
DIGITAL IMAGE PROCESSING

Course Code: ECS704

L	T	P	C
3	2	0	4

Objective: This paper gives the details of the topics of digital image processing like digital image fundamental, image enhancement, image restoration, image compression, image segmentation etc

Course Contents

Unit I

Digital Image Fundamentals: representation - elements of visual perception - simple image formation model - Image sampling and quantization - basic relationships between pixels - imaging geometry. Review of matrix theory results: Row and column ordering - Toeplitz, Circulant and Block matrices. Review of Image transforms: 2D-DFT, FFT, Walsh , Hadamard , Haar, DCT and wavelet transforms. **(Lectures 08)**

Unit II

Image Enhancement: Spatial domain methods: point processing - intensity transformations, histogram processing, image subtraction, image averaging; Spatial filtering- smoothing filters, sharpening filters. Frequency domain methods: low pass filtering, high pass filtering, homomorphic filtering. Generation of spatial masks from frequency domain specifications. **(Lectures 08)**

Unit III

Image Restoration: Degradation model - Diagonalization of circulant and Block circulant matrices - Algebraic approaches- Inverse filtering - Wiener filter - Constrained Least squares restoration - Interactive restoration -Geometric transformations. Fundamentals of Colour image processing: colour models - RGB, CMY, YIQ, HIS - Pseudo color image processing - intensity slicing, gray level to color transformation. **(Lectures 08)**

Unit IV

Image Compression: fundamentals- redundancy: coding, inter pixel, psychovisual, fidelity criteria, Models, Elements of information theory, Error free compression- variable length, bit plane, lossless predictive, Lossy compression- lossy predictive, transform coding. Fundamentals of JPEG, MPEG, Fractals. **(Lectures 08)**

Unit V

Image Segmentation: Detection of discontinuities - point, line and edge and combined detection ; Edge linking and boundary description - local and global processing using Hough transform Thresholding - Region oriented segmentation - basic formulation, region growing by pixel aggregation, region splitting and merging - Use of motion in segmentation. Fundamentals of Representation and Description. **(Lectures 08)**

Text Books

1. Gonzalez and Woods, *Digital Image Processing*, Pearson Education, 2002.
2. Jain Anil K., *Fundamentals of Digital Image Processing*, Pearson Education, 2003.
3. Mark Nelson, *The Data Compression Book*, Jean- Loup Gailly, bpb Publications.

References Books

1. Pratt William K., *Digital Image Processing*, John Wiley & Sons
2. Chanda & Majumdar, *Digital Image Processing and Analysis*, PHI.
3. Sonka M. Hlavac V., *Image Processing, Analysis and Machine Vision*, R. Boyle, Vikas Publishing House.

*** Latest editions of all the suggested books are recommended.**

Semester VII
MANAGEMENT INFORMATION SYSTEM

Course Code: ECS705

L	T	P	C
3	2	0	4

Objective: To provide the knowledge of information system in business. Also gives the view for several information system and its uses.

Course Contents

Unit I

Foundation of Information Systems: Introduction to information system in business, fundamentals of information systems, Solving business problems with information systems, Types of information systems, Effectiveness and efficiency criteria in information system. An overview of Management Information Systems. Definition of a management information system, MIS versus Data processing, MIS & Decision Support Systems, MIS & Information Resources Management, End user computing, Concept of an MIS, Structure of a Management information system. **(Lectures 08)**

Unit II

System Analysis & Design: System Analysis Design function, CASE Tools, Project Feasibility, Information Requirement &Decision Analysis, Preparing System Proposal, Input/Output design, Procedures & control design, System development, Testing & Quality assurance. **(Lectures 08)**

Unit III

Concepts of Planning & Control: Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, the nature of control in an organization. **(Lectures 08)**

Unit IV

Business Applications of Information Technology: Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions, Information System for Business Operations, Information System for Managerial Decision Support, Information System for Strategic Advantage. **(Lectures 08)**

Unit V

Managing Information Technology: Enterprise & global management, Security & Ethical challenges, Planning & Implementing changes. Advanced Concepts in Information Systems Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management, and Procurement Management. **(Lectures 08)**

Text Books

1. Brian O, *Management Information System*, TMH
2. Gordon B. Davis & Margrethe H. Olson*, Management Information System*, TMH.

Reference Books

1. Brian O*., Introduction to Information System*, Mcgraw Hill.
2. Murdick, *Information System for Modern Management*, PHI.
3. Jawadekar, *Management Information System*, TMH.
4. Jain Sarika, *Information System*, PPM
5. Davis, *Information System*, Palgrave Macmillan

*** Latest editions of all the suggested books are recommended.**

Semester VII
DIGITAL IMAGE PROCESSING (LAB)

Course Code: ECS753

L	T	P	C
0	0	4	2

Course Contents

1. Implement the spatial image enhancement functions on a bitmap image –
   (a) Mirroring (Inversion)
   (b) Rotation (Clockwise)
   (c) Enlargement (Double Size)

2. Implement
   (a) Low Pass Filter
   (b) High Pass Filter

3. Implement
   (a) Arithmetic Mean Filter
   (b) Geometric Mean Filter

4. Implement Smoothing and Sharpening of an eight bit color image

5. Implement
   (a) Boundary Extraction Algorithm
   (b) Graham's Scan Algorithm

6. Implement
   (a) Edge Detection
   (b) Line Detection

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VII
MANAGEMENT INFORMATION SYSTEM (LAB)

Course Code: ECS754

L	T	P	C
0	0	4	2

List of Projects are as follows (Implement any one):

1. Shopping cart project: This sample project has all basic features required for a shopping cart web site including Login, Registration, Add to Cart, Checkout etc.
2. Personal Assistant: This is a small project for managing personal details. Current version of this project support Address Book feature - Add, Edit and Manage contacts and addresses.
3. Address Book: This is a small project for managing contact details.
4. School Management System: This is a project for managing education institutes.
5. Library Management System: This is an academic project for students.
6. Pider Alerts & Web services: This project communicates with web services and downloads Alerts from the web server.
7. Atient Information System: This software can be used to keep track of the patients' information and treatment details in a hospital or clinic. Some of the advanced features include patient consulting, lab information, billing etc.
8. Web based Address Book: This application can be used to keep track of your contacts/addresses. N Tier architecture is used to separate data layer, business layer and UI layers.
9. Installation of TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies.
10. Do the assignment 7 using JSP by converting the static web pages of assignment 2 into dynamic web pages. Create database with User Information and Item information. The Item catalog should be dynamically loaded from the database.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VII
ADVANCED COMPUTER NETWORKS

Course Code: ECS706

L	T	P	C
3	2	0	4

Objective: The aim of this subject is to give knowledge about advanced concepts of network to the students. This includes important aspects of networks like mobile network, wireless networks, Ad-Hoc networks, and advanced security issues.

Course Contents

Unit I

Introduction: Overview of computer network, seven-layer architecture, TCP/IP suite of protocol, MAC protocols for high-speed LANS, MANs & WIRELESS LANs. (FDDI, DQDB, HIPPI, Gigabit Ethernet, Wireless Ethernet) Fast access technologies including ADSL and Cable Modem. **(Lectures 08)**

Unit II

IPv6: why IPv6, basic protocol, extension & option, support for Quality of Service, security, neighbor discovery, auto-configuration, routing. Change to other protocols. Application programming interface for IPv6, 6bone. **(Lectures 08)**

Unit III

Mobility in network, Mobile Security related issues, IP Multicasting. Multicasting routing protocols, address assignments, session discovery. **(Lectures 08)**

Unit IV

Ad Hoc Wireless Networks: Introduction, Issues in Ad Hoc Wireless Networks, Ad Hoc Wireless Internet Routing Protocols, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classifications of Routing Protocols, Table-Driven Routing Protocols, On Demand Routing Protocols, Hybrid Routing Protocols, Routing Protocols with Efficient Flooding Mechanisms, Hierarchical Routing Protocols, Power-Aware Routing Protocols. **(Lectures 08)**

Unit V

Network security at various layers, Secure-HTTP, SSL, ESP, Authentication header, Key distribution protocols, Digital signatures and digital certificates. **(Lectures 08)**

Text Books:

1. Frouzan B. A., *Data Communication and Networking*, TMH
2. Siva C. Ram Murthy, *Ad Hoc Wireless Networks: Architectures and Protocols*, B.S. Manoj, Pearson Tenenbaum, PHI
3. Stallings William, *Cryptography and Network Security*, PHI

Reference Books:

1. Stevens W. R. *TCP/IP illustrated, Volume 1: The protocols*, Addison Wesley
2. Wright G. R. *TCP/IP illustrated, Volume 2: The implementation*, Addison Wesley
3. Gast Matthew, *Wireless Networks: The Definitive Guide*, 802.11, O'Reilly

*** Latest editions of all the suggested books are recommended.**

Semester VII
INFORMATION STORAGE & RETRIEVAL

Course Code: ECS707

L	T	P	C
3	2	0	4

Objective: Information storage and management is the new concept in computer science field. This paper explains how the information is store and managed.

Course Contents

Unit I

Complexity of Information Management: Proliferation of Data, Data Center Evolution, Managing Complexity, I/O and the five pillars of technology, Storage Infrastructure, Evolution of Storage. **(Lectures 08)**

Unit II

Storage Systems Architecture: Modern Storage Systems, Storage Systems, Intelligent Disk Subsystems, Physical Disks, Back End, Cache, Front End, Host Environment. **(Lectures 08)**

Unit III

Introduction to Networked Storage: Storage Networking Overview, Direct Attached Storage, Storage Area Networks, Case study – Applying SAN concepts, Network Attached Storage, Case study – Applying NAS concepts, IP SAN, CAS, Hybrid Network Storage Based Solutions/ Emerging Technologies, Case study – Applying SAN, NAS, IP SAN concepts. **(Lectures 08)**

Unit IV

Introduction to Information Availability: Business Continuity Overview, Data Availability, Business Continuity – Local, Case study – Applying local information availability strategies, Business Continuity – Remote, Case study – Applying remote information availability strategies, Disaster Recovery. **(Lectures 08)**

Unit V

Managing and Monitoring: Monitoring in the Data Center, Case study – Monitoring exercise, Management in the Data Center, Case study – Managing exercise. **(Lectures 08)**

Text Book:

1. Marc Farley Osborne, *Building Storage Networks*, Tata Mc Graw Hill, 2001
2. Robert Spalding, *Storage Networks: The Complete Reference*, Tata Mcgraw Hill, 2003
3. NIIT *Introduction to Information Security Risk Management*, Prentice-Hall of India, 2000

*** Latest editions of all the suggested books are recommended.**

Semester VII
CRYPTOGRAPHY AND NETWORK SECURITY

Course Code: ECS708

L	T	P	C
3	2	0	4

Objective: To familiarize the students with techniques of cryptography.

Course Contents

Unit I

Introduction to Security: Attacks, Services & Mechanisms, Security Attacks, Security Services. Conventional Encryption: Classical Techniques, Conventional Encryption Model and Steganography, Classical Encryption Techniques. **(Lectures 08)**

Unit II

DES Standard, DES Strength, Block Cipher Design Principles, Block Cipher Modes Of Operation, Triples DES, Placement & Encryption Function, Key Distribution, Random Number Generation, Placement Of Encryption Function. **(Lectures 08)**

Unit III

Public-Key Cryptography: Principles Of Public-Key Cryptosystems, RSA Algorithm, Key Management, Fermat's & Euler's Theorem, Primarily, The Chinese Remainder Theorem. **(Lectures 08)**

Unit IV

Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security Of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS), Proof Of Digital Signature Algorithm. **(Lectures 08)**

Unit V

Electronic Mail Security, Pretty Good Privacy (PGP), S/Mime, Security: Architecture, Authentication Header, Encapsulating Security Payloads, Combining Security Associations, Key Management, Web Security: Secure Socket Layer & Transport Layer Security, Secure Electronic Transaction (Set), System Security: Intruders, Viruses, Firewall Design Principles, Trusted Systems. **(Lectures 08)**

Text Book

1. Stallings William, *Cryptography and Network Security: Principles and Practice*, Prentice Hall, New Jersey.
2. Kahate Atul, *Cryptography and Network Security*, TMH

Reference Book

1. Johannes A. Buchmann, *Introduction to Cryptography*, Springer, Verlag.

*** Latest editions of all the suggested books are recommended.**

Semester VII
INDUSTRIAL TRAINING PRESENTATION
(BASED ON INDUSTRIAL TRAINING DONE AFTER THE VI SEMESTER EXAMINATION IN SUMMER)

Course Code: ECS791

L	T	P	C
0	0	0	4

Guidelines

Students will have to undergo industrial training of six weeks in any industry or reputed organization after the VI semester examination in summer. The evaluation of this training shall be included in the VII semester evaluation.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the VI semester and shall be the nodal officer for coordination of the training.

Students will prepare an exhaustive technical report of the training during the VII semester which will be duly signed by the officer under whom training was undertaken in the industry/ organization. The covering format shall be signed by the concerned office in-charge of the training in the industry. The officer-in-charge of the trainee would also give his rating of the student in the standard University format in a sealed envelope to the Director of the college.

The student at the end of the VII semester will present his report about the training before a committee constituted by the Director of the College which would comprise of at least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Director. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately in a sealed envelope to the Director.

The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned.

Not more than three students would form a group for such industrial training/ project submission.

The marking shall be as follows.

Internal: 50 marks
By the Faculty Guide - 25 marks
By Committee appointed by the Director – 25 marks

External: 50 marks
By Officer-in-charge trainee in industry – 25 marks
By External examiner appointed by the University – 25 marks

Semester VII
DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP771

L	T	P	C
0	0	0	1

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).

Semester VIII

WEB-TECHNOLOGY (DESIGN & ARCHITECTURE USING .NET)

Course Code: ECS801

L	T	P	C
3	2	0	4

Objective: To understand the basics of internet Programming and working of MS.NET Framework, Focus on rich inbuilt set of classes in .NET framework, how to develop secure and scalable internet applications and their deployment.

Course Contents

Unit I

Introduction to Web Pages, Introduction to HTML, Designing static HTML Pages using various tags Text Box, Button, Radio Button, Check Box, Text Area, Img, Links, Anchors, Table, Lists, Dropdown List, etc. Form Submission using Get and Post Methods. Introduction to JavaScript, adding JavaScript to static HTML pages. Publishing a website. **(Lectures 08)**

Unit II

Architecture of the .Net Framework Development Platform - Compiling Source Code into Managed Modules, Parts of a Managed Module – PE Header, CLR Header, Metadata, Intermediate Language(IL), Combining Managed Modules into Assemblies Loading the CLR, Executing the Assembly Code, The .Net Framework Class Library, Common Type System, Common Language Specification. Building, Packaging, Deploying, and Administering Applications and Types. **(Lectures 08)**

Unit III

Introduction to Visual Studio .Net, Installing the .Net Framework (2.0, 3.0 & 3.5) Installing the Visual Studio.Net IDE.

Introduction to ASP.Net – ASP.Net and Web Forms, ASP.Net Applications, Application Configurations. ASP.Net Server Controls, Using standard controls. Using Rich Controls, Using Validation Controls. **(Lectures 08)**

Unit IV

Designing ASP.Net Websites – Using Standard Controls on Master Pages. Designing Websites with Themes, creating Custom Controls. Introduction to ADO.Net, Connected vs Disconnected Data Access. Data Bound Controls, Data Source Controls. **(Lectures 08)**

Unit V

Site Navigation – Navigation Control, Site Maps. Security Mechanism – Login Controls. Session Management. Localization and Globalization of your site. Introduction to AJAX. Designing a Sample e-mail web application – using Master Page, Standard Controls, JavaScript, AJAX, Cookies and Sessions, Uploading files and DataBound Controls such as GridView and Repeaters. **(Lectures 08)**

Text Books

1. ASP.Net, *C# Developers Guide*, Addison Wesley.
2. ASP.Net *Programming Bible*t.
3. Laura Lemay, *Sams Teach Yourself: Web Publishing with HTML and CSS in One Hour a Day*, Rafe Colburn.

Reference Books

1. Greg Hack, Jason Werry *C#.Net Developers Guide*, Saurabh Nandu. (SyngRess).
2. Robinson Simon , *C#,* Jay Glynn, Wrox Press Professional.

*** Latest editions of all the suggested books are recommended.**

Semester VIII
MOBILE COMPUTING

Course Code: ECS802

L	T	P	C
3	2	0	4

Objective: To make the students understand the wireless communication and mobile computing.

Course Contents

Unit I

Introduction to Personal Communication Services (PCS): PCS architecture, Mobility management, Networks signaling. **(Lectures 08)**

Unit II

Global system for Mobile Communication (GSM) system overview: GSM Architecture, Mobility Management, Network signaling, General Packet Radio Services (GPRS): GPRS architecture, GPRS Network nodes. **(Lectures 08)**

Unit III

Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP. Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, Wireless Markup Languages (WML) **(Lectures 08)**

Unit IV

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G. **(Lectures 08)**

Unit V

Wireless Local Loop (WLL): Introduction to WLL architecture, WLL technologies. Global Mobile Satellite Systems: Case studies of Iridium and Global star systems. Bluetooth technology and Wi-Max.

(Lectures 08)

Text Books

1. Yi –Bing Lin & Imrich Chlamatac, *Wireless and mobile Networks Architecture,* John Wiley & Sons, 2001.
2. Pandya Raj, *Mobile & Personnel communication Systems and Services*, Prentice Hall India, 2001.
3. Schiller Jochen, *Mobile communications,* Pearson Education Pvt. Ltd., 2002.

References Books:

1. Hensmann, Merk, & Stober, *Principles of Mobile Computing,* Springer International Edition, 2003.
2. Talukdar & Yaragal*, Mobile Computing,* TMH, 2005.
3. Smith & Collins, *3G Wireless Networks*, TMH, 2007.
4. Theodore S. Rappaport, *Wireless Communication- Principles and Practices,* Pearson Education Pvt. Ltd, 2003.
5. Singhal & Bridgman etal.*, The Wireless Application Protocol,* Pearson Education, 2004.

*** Latest editions of all the suggested books are recommended.**

Semester VIII
MULTIMEDIA AND ANIMATION

Course Code: ECS803

L	T	P	C
3	2	0	4

Objective: To impart the core knowledge of Multimedia Systems and Animation. It includes all basic concepts which are helpful for students to have the better understanding of Multimedia knowledge.

Course Contents

Unit I

Evolution of Multimedia and its objects, Scope of multimedia in business & work, Production and planning of Multimedia applications. Multimedia hardware, Memory & Storage Devices, Communication Devices, Multimedia Software, Presentation and object generation tools, video, sound, Image capturing, Authoring Tools, Card & Page Based Authoring Tools. **(Lectures 08)**

Unit II

Production and Planning of Multimedia building blocks, Text, sound (MIDI), Digital Audio, and Audio File Formats, MIDI under Windows environment, Audio & Video Capture. **(Lectures 08)**

Unit III

Macromedia products, Basic drawing techniques, Advance animation techniques, Creating multi layer, Combining interactivity and multiple scenes, Creating transparency effects using text in Flash, Flash animation. **(Lectures 08)**

Unit IV

Digital Audio Concepts, Sampling variables, Loss Less compression of sound, Lossy compression & Silence compression. **(Lectures 08)**

Unit V

Multimedia monitor bitmaps, Vector drawing, Lossy graphic compression, Image file formatic animations Image standards, J P E G compression, Video representation, colors, video compression, MPEG standards, MHEG standard Multimedia Application Planning Costing Proposal Preparation and Financing case study of a typical industry. **(Lectures 08)**

Text Books

1. Andreas Halzinger, *Multimedia Basics*, Firewall Media, New Delhi.
2. Tay Vaughan, *Multimedia Making It work*, Tata McGraw Hill.
3. Buford, *Multimedia Systems*, Addison Wesley.

References Books

1. Agarwal and Tiwari, *Multimedia Systems*, Excel.
2. Rosch, *Multimedia Bible*, Sams Publishing
3. Sleinreitz, *Multimedia Systems*, Addison Wesley
4. Ken Milburn, *Flash 4 web special Effects, Animation & Design Handbook,* John Croteau, Dreamtech Press.
5. John Villamil–Casanova & Louis Molina *Multimedia-Production, planning & delivery,*

*** Latest editions of all the suggested books are recommended.**

Semester-VIII
INDUSTRIAL SOCIOLOGY & PROFESSIONAL ETHICS

Course code: EHM 801	L	T	P	C
	2	2	0	3

(INDUSTRIAL SOCIOLOGY)

Course Contents:

Unit I

Sociology in the industrial Perspective: Concept of Sociology, Sociology as a Science, Sociology of work & industry, Perspectives for sociological analysis of work, Class- Conflict in Industry, Social impact of industrialization, Corporate skills in the fast growing multinational set up. **(10 Hours)**

Unit II

Work experience in Industry: The concept of alienation, Work satisfaction, Technology & work experience, Social background of workers, Work orientations, Stress & anxiety of the worker, Work & Leisure, Unemployment, Conflicts in the work place. **(10 Hours)**

Reference Books:

1. Miller & Form, *Industrial Sociology*, London Harper & Row.
2. Sheth N.R., *Social Frame Work of Indian Factory,* O.U.P. Bombay.
3. Gisbert P., *Fundamentals of Industrial Sociology,* O.U.P. New Delhi.
4. Watson Tony J., *Sociology: Work & Industry*, New York. Routledge.

(PROFESSIONAL ETHICS)

Course Contents:

Unit III

General and Applied Ethics- Ethics and the professions – Standard of right and wrong, problems of Ethical Certainty, Significance of professional Ethics for Engineers, New Technology and Ethics, Applied Ethics - Cases in professional Engineering Practice, Principles of business ethics, Individual in the organization. **(10 Hours)**

Unit IV

Ethical Leadership: Decision making, corporate culture and reputation management, corporate social responsibility and social reporting. **(10 Hours)**

Reference Books:

1. Fleddermann Charles, *Engineering Ethics*, Upper Saddle River- N.J. Prentice Hall.
2. Parsons Richard D., *The Ethics of Professional Practice*- Allyn & Bacon, London.
3. Schinzinger, Roland & Mike W. Martin, *Introduction to Engineering Ethics*- Boston, McGraw Hill.
4. Govindarajan - *Engineering Ethics*- Prentice Hall (India) New Delhi.
5. Bhatia S.K. - *Business Ethics & Management Values*- Deep & Deep Publication. N.Delhi.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

Semester VIII
WEB TECHNOLOGY (LAB)

Course Code: ECS851

L	T	P	C
0	0	4	2

List of Experiments

The students are advised to get exposed to web technologies like HTML, XML and their variants as well as Java Programming

1. Write HTML/Java scripts to display your CV in Web Browser.
2. Creation and annotation of static web pages using any HTML editor.
3. Write a program to use XML and JavaScript for creation of your homepage.
4. Write a program in XML for creation of DTD which specifies a particular set of rules.
5. Create a Stylesheet in CSS/XSL and display the document in Web Browser.
6. Write a Java Servelet for HTTP Proxy Server.
7. Use JSP pages for sharing session and application data of HTTP Server.
8. Write a program to use JDBC connectivity program for maintaining database by sending queries.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

*** Latest editions of all the suggested books are recommended.**

Semester VIII
EMBEDDED SYSTEMS

Course Code: EEC807

L	T	P	C
3	2	0	4

Objective: To impart the knowledge of introduction to embedded system, interrupt basics, survey of software architecture, inter-task communication, embedded software development tools, debugging techniques.

Course Contents

Unit I **(Lectures 08)**

Embedded system Introduction: Introduction to Embedded System, History, Design challenges, optimizing design metrics, time to market, applications of embedded systems and recent trends in embedded systems, embedded design concepts and definitions, memory management, hardware and software design and testing, communication protocols like SPI, SCI, I2C, CAN etc

Unit II **(Lectures 08)**

System Architecture: Introduction to ARM core architecture, ARM extension family, instruction set, thumb Instruction set, Pipeline, memory management, Bus architecture, study of on-chip peripherals like I/O ports, timers, counters, interrupts, on-chip ADC, DAC, RTC modules, WDT, PLL, PWM, USB etc.

Unit III **(Lectures 08)**

Interfacing and Programming: Basic embedded C programs for on-chip peripherals studied in system architecture. Need of interfacing, interfacing techniques, interfacing of different displays including Graphic LCD (320X240), interfacing of input devices including touch screen etc, interfacing of output devices like thermal printer etc., embedded communication using CAN and Ethernet, RF modules, GSM modem for AT command study etc.

Unit IV **(Lectures 08)**

Real Time Operating System Concept: Architecture of kernel, task scheduler, ISR, Semaphores, mailbox, message queues, pipes, events, timers, memory management, RTOS services in contrast with traditional OS. Introduction to Ucos II RTOS, study of kernel structure of Ucos II, synchronization in Ucos II, Inter-task communication in Ucos II, memory management in Ucos II, porting of RTOS.

Unit V **(Lectures 08)**

Embedded Linux: Introduction to the Linux kernel, Configuring and booting the kernel, the root file system, Root file directories, /bin, /lib etc., Linux file systems, Types of file system: Disk, RAM, Flash, Network. Some debug techniques- Syslog and strace, GDB, TCP/IP Networking- Network configuration, Device control from user space- Accessing hardware directly, Multi processing on Linux and Inter Process Communication- Linux process model and IPCs, Multithreading using p Threads - Threads verses Processes and pThreads, Linux and Real-Time Standard kernel problems and patches.

Text Books:

1. H.Kopetz, "*Real-Time Systems*", Kluwer, 1997.
2. R.Gupta, "*Co-synthesis of Hardware and Software for Embedded Systems*", Kluwer 1995.

References Books:

1. Rajkamal - *Embedded Systems*, TMH.
2. David Simon - *Embedded systems software primer*, Pearson
3. Steve Furber - *ARM System-on-Chip Architecture*, Pearson
4. Jean J Labrose – *Micro C/OS-II*, Indian Low Price Edition
5. DR.K.V.K.K. Prasad - *Embedded/Real Time System*, Dreamtech
6. Iyer, Gupta - *Embedded Real Systems Programming*, TMH
7. Steve Heath - *Embedded System Design*, Neuwans

*** Latest editions of all the suggested books are recommended.**

Semester VIII
DATA WAREHOUSING AND DATA MINING

Course Code: ECS804

L	T	P	C
3	2	0	4

Objective: Effective decision making is essential for the success of any organization. The historical data of the organization is used for decision making and strategic planning. Data Warehouse is used to manage the old data and mining is used for finding the appropriate information for decision making.

Course Contents

Unit I

Data Warehousing: Introduction to Data Warehousing: Evolution of Data Warehousing, Data Warehousing concepts, Benefits of Data Warehousing, Comparison of OLTP and Data Warehousing, Problems of Data Warehousing. **(Lectures 08)**

Unit II

Principles of dimensional modeling: Objectives, From Requirements to data design, the STAR schema, STAR Schema Keys, Advantages of the STAR Schema

Dimensional Modeling: Updates to the Dimension tables, miscellaneous dimensions, the snowflake schema, aggregate fact tables, families of STARS **(Lectures 08)**

Unit III

Data Warehousing Architecture: Operational Data and Data store, Load Manager, Warehouse Manager, Query Manager, Detailed Data, Lightly and Highly summarized Data, Archive/Backup Data, Meta-Data, architecture model, 2-tier, 3-tier and 4-tier data warehouse. **(Lectures 08)**

Unit IV

OLAP definitions and rules, OLAP characteristics, major features and functions, general features, dimensional analysis, hyper cubes, Drill-down and roll-up, slice-and-dice or rotation, OLAP models **(Lectures 08)**

Unit V

Data Mining Basics: What is Data Mining, Data Mining Defined, The knowledge discovery process, OLAP versus data mining, data mining and the data warehouse, Major Data Mining Techniques, Cluster detection, decision trees, memory-based reasoning, link analysis, neural networks, genetic algorithms, moving into data mining, Data Mining Applications, Benefits of data mining. **(Lectures 08)**

Text Books

1. Paul Raj Poonia, *Fundamentals of Data Warehousing*, John Wiley & Sons, 2004.
2. Inmon W. H., *Building the Operational Data Store*, John Wiley, 1999.

References Books

1. Anahony Sam, *Data Warehousing in the Real World: A Practical Guide for Building Decision Support Systems*, John Wiley, 2004
2. Kamber and Han, D*ata Mining Concepts and Techniques*, Hartcourt India P. Ltd., 2001

*** Latest editions of all the suggested books are recommended.**

Semester VIII
EMBEDDED SYSTEM (LAB)

Course Code: EEC855

L	T	P	C
0	0	4	2

LAB EXERCISE

- Integrated Development Environment Overview (Project creation, down load and debug)
- Study of JTAG Debugger/on-board debugger-emulator.
- ARM Instructions execution (Barrel Shifter, LDR / STR, SMT / LDM)

List of Practical:

GROUP - A

1) Writing basic C-programs for I/O operations
2) C-Program to explore timers/counter
3) C-programs for interrupts
4) Program to demonstrate UART operation

GROUP - B

5) Program to demonstrate I2C Protocol.
6) Program to demonstrate CAN Protocol.

GROUP - C

7) Program to interface LCD
8) Program to interface Keyboard and display key pressed on LCD
9) Program to interface stepper motor

GROUP - D

10) Program to demonstrate RF communication
11) Program to implement AT commands and interface of GSM modem
12) Implementation of USB protocol and transferring data to PC.
13) Implementation of algorithm /program for the microcontroller for low power modes.
14) COS II / Embedded Linux RTOS Examples

GROUP - E

15) Interfacing 4 x 4 matrix keyboards and 16 x 2 characters LCD displays to microcontroller / microprocessor and writing a program using RTOS for displaying a pressed key.
16) Writing a scheduler/working with using RTOS for 4 tasks with priority. The tasks may be keyboard, LCD, LED etc. and porting it on microcontroller/ microprocessor.

GROUP - F

17) Implement a semaphore for any given task switching using RTOS on microcontroller board.
18) Create two tasks, which will print some characters on the serial port, Start the scheduler and observe the behavior.

GROUP – G

19) RTOS based interrupt handling using Embedded Real Time Linux.
20) Program for exploration of (Process creation, Thread creation) using Embedded Real Time Linux.

GROUP – H

21) Program for exploring Message Queues using Embedded Real Time Linux.
22) Ethernet Based Socket Programming using Embedded Real Time Linux.

Note:

1) At least ONE practicals should be performed from EACH GROUP.
   Two practical should be performed using the JTAG debugger / on-board Debugger- emulator

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VIII
DATA WAREHOUSING AND DATA MINING (LAB)

Course Code: ECS852

L	T	P	C
0	0	4	2

List of Experiments:

1. Implement Inferring rudimentary rules
2. Implement Statistical modeling
3. Implement Divide-and-conquer: constructing decision trees
4. Implement Covering algorithms: constructing rules
5. Implement Mining association rules
6. Implement linear models

Evaluation of Practical Examination:

Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

Semester VIII
SIMULATION AND MODELING

Course Code: ECS805

L	T	P	C
3	2	0	4

Objective: This subject aims at analysis of problems before implementing it through simulation techniques and to predict the performance of system by providing historical data with the use of computers.

Course Contents

Unit I

System definition and components, stochastic activities, continuous and discrete Systems, System modeling, types of models, static and dynamic physical models, Static and dynamic mathematical models, Full corporate model, types of system study. **(Lectures 08)**

Unit II

System simulation, Why to simulate and when to simulate, Basic nature of simulation, technique of simulation, comparison of simulation and analytical methods, types of system simulation, real time simulation, hybrid simulation, simulation of pure-pursuit problem single-server queuing system and an inventory problem, Monte Carlo simulation, Distributed Lag models, Cobweb model.

(Lectures 08)

Unit III

Simulation of continuous systems, analog vs. digital simulation, simulation of water reservoir system, simulation of a servo system, simulation of an autopilot Discrete system Simulation, Fixed time-step vs. event-to-event model, generation of random numbers, Test for randomness, Generalization of non-uniformly distributed random numbers, Monte-Carlo computation vs. stochastic simulation. **(Lectures 08)**

Unit IV

System dynamics, exponential growth models, exponential decay models, modified exponential growth models, logistic curves, generalization of growth models, System Dynamics diagrams, Feedback in Socio-Economic systems, world model. **(Lectures 08)**

Unit V

Simulation of PERT networks, Critical path computation, uncertainties in Activity duration, Resource allocation and consideration, Simulation software, Simulation languages, continuous and discrete simulation languages, Expression based languages, object-oriented simulation, general-purpose vs. application-oriented simulation packages, CSMP-III, MODSIM-III. **(Lectures 08)**

Text Books:

1. Geoftrey Gordon, *System Simulation*, PHI
2. Narsingh Deo, *System Simulation with Digital Computer*, PHI
3. W. David Kelton, *Simulation Modeling and Analysis*, TMH

Reference Book:

1. Banks, *Discrete Event System Simulation*, Carson, PHI

*** Latest editions of all the suggested books are recommended.**

Semester VIII
NATURAL LANGUAGE PROCESSING

Course Code: ECS806

L	T	P	C
3	2	0	4

Objective: The aim is to expose the students to the basic principles of language processing and typical applications of natural language processing systems

Unit I

INTRODUCTION: Natural Language Generation: Architecture for generation – Surface realization – Discourse planning – Other issues, Knowledge in speech and language processing – Ambiguity – Models and Algorithms – Language, Thought and Understanding. Morphology and Finite-State Transducers: Survey of English morphology – Finite-State Morphological parsing. **(Lecture 08)**

Unit II

SYNTAX: Word classes and part-of-speech tagging: English word classes – Tagsets for English – Part-of-speech tagging – Rule-based part-of-speech tagging – Stochastic part-of-speech tagging – Transformation-based tagging – Other issues. Context-Free Grammars for English: Constituency – Context-Free rules and trees – Sentence-level constructions – The noun phrase – Coordination – Agreement – The verb phase and sub categorization – Auxiliaries – Spoken language syntax – Grammars equivalence and normal form – Finite-State and Context-Free grammars – Grammars and human processing. **(Lecture 08)**

Unit III

ADVANCED FEATURES AND SYNTAX: Features and Unification: Feature structures – Unification of feature structures – Features structures in the grammar – Implementing unification – Parsing with unification constraints – Types and Inheritance. Lexicalized and Probabilistic Parsing: **(Lecture 08)**

Unit IV

SEMANTIC: Representing Meaning: Computational desiderata for representations – Meaning structure of language – First order predicate calculus – Some linguistically relevant concepts – Related representational approaches – Alternative approaches to meaning. Semantic Analysis: Syntax-Driven semantic analysis – Attachments for a fragment of English – Integrating semantic analysis into the early parser – Idioms and compositionality – Robust semantic analysis. **(Lecture 08)**

Unit V

APPLICATIONS: Word Sense Disambiguation and Information Retrieval: Selectional restriction-based disambiguation – Robust word sense disambiguation – Information retrieval – other information retrieval tasks. Machine Translation: Language similarities and differences – The transfer metaphor – The interlingua idea: Using meaning – Direct translation – Using statistical techniques – Usability and system development. **(Lecture 08)**

Text Books:

1. Daniel Jurafsky & James H.Martin, " Speech and Language Processing", Pearson Education (Singapore) Pte. Ltd., 2002.

Reference Books:

1. James Allen, "Natural Language Understanding", Pearson Education, 2003.

*** Latest editions of all the suggested books are recommended.**

Semester VIII
PROJECT WORK

Course Code: ECS899

L	T	P	C
0	0	6	6

Students should devote themselves to make a project which preferably should be a working model of their thoughts based on their subject of choice.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the VI semester.

The project shall be finalized by the students before the start of the VII semester and shall be completed and submitted at least one month before the last teaching day of the VIII semester, date of which shall be notified in the academic calendar.

The assessment of performance of students should be made at least twice in each semester i.e. VII and VIII and each internal assessment shall be for 25 marks. The student shall present the final project live as also using overheads project or power point presentation on LCD to the internal committee as also the external examiner.

The evaluation committee shall consist of faculty members constituted by the college which would comprise of at-least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Director. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately in a sealed envelope to the Director.

Not more than three students would form a group for such industrial training/ project submission.

The marking shall be as follows.

Internal: 50 marks
By the Faculty Guide - 25 marks
By Committee appointed by the Director – 25 marks

External: 50 marks
By External examiner appointed by the University – 50 marks

Semester VIII
DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP871

L	T	P	C
0	0	0	1

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).