

Study & Evaluation Scheme

Bachelor of Technology (Computer Science & Engineering)

[Applicable w.e.f Academic Session 2017-18 till revised]



**COLLEGE OF COMPUTING SCIENCES &
INFORMATION TECHNOLOGY**

TEERTHANKER MAHAVEER UNIVERSITY

Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in



TEERTHANKER MAHAVEERUNIVERSITY

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

Delhi Road, Bagarpur, Moradabad(U.P)

Study & Evaluation Scheme

Bachelor of Technology (CSE)

SUMMARY

Programme	: B.Tech.(CSE)
Duration	: Four year full time (Eight Semesters)
Medium	: English
Minimum Required Attendance	: 75%
Credit	:
Maximum Credit	: <input type="text" value="234"/>
Minimum credit required for the degree	: <input type="text" value="218"/>

	Internal	External	Total
Assessment Theory	40	60	100

Internal Evaluation(Theory Papers)	Class Test I	Class Test II	Class Test III	Assignment(s)	attendance	Total
	Best two out of the three					
	10	10	10	10	10	40

Project Phase-1	Internal	External	Total
	50	50	100

Evaluation of Practical/Industrial Training/Project Phase-2	:	Internal	External	Total
		50	50	100

Duration of Examination	:	External	Internal
		3hrs.	1 ½hrs

To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester examination and teachers continuous evaluation. (i.e. both internal and external). A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have secured at least 45% marks in aggregate to clear the semester.

Question Paper Structure

- 1. The question paper shall consist of 6 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 2 marks each).*
- 2. Out of the remaining five questions, The long answer pattern will have internal choice with unit wise questions with internal choice in each unit. In units having numerical, weightage and information should be available both in the syllabus and the paper pattern. The weightage of Question No. 2 to 6 shall be 10 marks each.*

Internal Evaluation (50 marks)

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
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External Evaluation (50 marks)

The external evaluation would also be done by the External Examiner based on the experiment performed during the examination.

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	TOTAL EXTERNAL (50 MARKS)
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Study & Evaluation Scheme
Programme: B. Tech. (Computer Science & Engineering)

Semester I

<i>S. No</i>	<i>Category (Core & Non-core)</i>	<i>Course Code</i>	<i>Subject</i>	<i>Periods</i>			<i>Credit</i>	<i>Evaluation Scheme</i>		
				<i>L</i>	<i>T</i>	<i>P</i>		<i>Internal</i>	<i>External</i>	<i>Total</i>
1	Non-Core	EAS116	Engineering Mathematics-I	3	1	-	4	40	60	100
2	Core	EAS112/212	Engineering Physics-I	3	1	-	4	40	60	100
	Core	EAS113/213	Engineering Chemistry							
3	Core	EEE117/217	Basic Electrical Engineering	3	1	-	4	40	60	100
	Core	EEC111/211	Basic Electronics Engineering							
4	Core	EAS115/ BAS214/ BAS328/ BAS428	Environmental Studies	1	2	-	2	40	60	100
5	Non-core	EHM199/ BHM199	English communication and soft skills – I	1	1	2	2	50	50	100
6	Core	EAS162/262	Engineering Physics (Lab)	-	-	2	1	50	50	100
	Core	EAS163/263	Engineering Chemistry (Lab)							
7	Core	EEE161/261	Basic Electrical Engineering (Lab)	-	-	2	1	50	50	100
	Core	EEC161/261	Basic Electronics Engineering (Lab)							
8	Core	EME161/261	Engineering Drawing (Lab)	-	-	4	2	50	50	100
	Core	EME162/262	Workshop Practice (Lab)							
9		EGP111	Discipline & General Proficiency	-	-	-		100	-	100
			Total	11	6	10	20	360	440	800

Semester II

S. N o	Category (Core & Non-core)	Course Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	Non-Core	EAS211	Engineering Mathematics-II	3	1	-	4	40	60	100
2	Core	EAS212/112	Engineering Physics-I	3	1	-	4	40	60	100
	Core	EAS213/113	Engineering Chemistry							
3	Core	EEE217/117	Basic Electrical Engineering	3	1	-	4	40	60	100
	Core	EEC211/111	Basic Electronics Engineering							
4	Core	ECS201	Computer Basics & C Programming	3	-	-	3	40	60	100
5	Non-core	EHM249	English communication and soft skills – II	1	1	2	2	40	60	100
6	Core	EAS262/162	Engineering Physics (Lab)	-	-	2	1	50	50	100
	Core	EAS263/163	Engineering Chemistry (Lab)							
7	Core	EEE261/161	Basic Electrical Engineering (Lab)	-	-	2	1	50	50	100
	Core	EEC261/161	Basic Electronics Engineering (Lab)							
8	Core	ECS251	Computer Basics & C Programming (Lab)	-	-	2	1	50	50	100
9	Core	EME261/161	Engineering Drawing (Lab)		-	4	2	50	50	100
	Core	EME262/162	Workshop Practice (Lab)							
10		EGP211	Discipline & General Proficiency	-	-	-		100	-	100
			Total	13	4	12	22	400	500	900

Semester III

S. No.	Category (Core & Non-core)	Course Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	Non-core	ECS301	Discrete Structure	3	1	0	4	40	60	100
2	Core	ECS305	Data Structure using C	3	1	0	4	40	60	100
3	Core	ECS306	Data Base Management System	3	1	0	4	40	60	100
4	Non-core	EEC302	Digital Electronics & Computer Organization	3	1	0	4	40	60	100
5	Non-core	EAS 301	Mathematics-III	3	1	0	4	40	60	100
6	Non-core	EHM 302	Organizational Behavior	3	0	0	3	40	60	100
7	Core	ECS355	Data Structure using C (Lab)	0	0	4	2	50	50	100
8	Core	ECS356	Data Base Management System (Lab)	0	0	3	1.5	50	50	100
9	Non-core	EEC 351	Digital Logic Circuit Lab	0	0	3	1.5	50	50	100
10	Non-core	EHM349	English Communication and Soft Skills-III	1	1	2	2	40	60	100
11	Non-core	EGP311	Discipline & General Proficiency	1	0	0	1	100	--	100
Total				20	06	12	31	530	570	1100

Additional Courses for Lateral Entry Students with B.Sc background, to be taken in III and IV semester and all should pass with minimum of 40% marks: credits will not be added.

1	Non-core	EME161/261	Engineering Drawing Lab	-	-	4	50	50	100
	Non-core	EME162/262	Workshop Practice (Lab)	-	-	4	50	50	100

Semester IV

S. No.	Category (Core & Non-core)	Course Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	Core	ECS401	Theory of Computation	3	1	0	4	40	60	100
2	Core	ECS 403	Object Oriented Programming System	3	1	0	4	40	60	100
3	Non-core	ECS404	Software Engineering	3	1	0	4	40	60	100
4	Non-core	ECS405	Computer Based Numerical & Statistical Techniques	3	1	0	4	40	60	100
5	Core	ECS406	Operating System	3	1	0	4	40	60	100
6	Non-core	EAS403	Human Values & professional Ethics	3	1	0	4	40	60	100
7	Core	ECS452	C++ Programming (Lab)	0	0	4	2	50	50	100
8	Non-core	ECS453	Computer Based Numerical & Statistical Techniques (Lab)	0	0	3	1.5	50	50	100
9	Core	ECS454	UNIX & Shell Programming (Lab)	0	0	3	1.5	50	50	100
10	Non-core	EHM499	English Communication and Soft Skills-IV	0	0	4	2	50	50	100
11	Non-core	EGP411	Discipline & General Proficiency	1	0	0	1	100	--	100
Total				19	6	14	32	540	560	1100

Semester V

S.N O.	Category (Core & Non-core)	Course Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	Core	ECS501	Compiler Design and Construction	3	1	0	4	40	60	100
2	Core	ECS 502	Computer Architecture	3	1	0	4	40	60	100
3	Core	ECS503	Analysis and Design of Algorithm	3	1	0	4	40	60	100
4	Core	ECS508	Java Programming	3	1	0	4	40	60	100
5	Non-core	EHM503	Engineering and Managerial Economics	3	1	0	4	40	60	100
6	Core	ECS552	Analysis and Design of Algorithm (Lab)	0	0	4	2	50	50	100
7	Core	ECS554	Java Programming (Lab)	0	0	4	2	50	50	100
8	Non-core	EHM 599	English Communication and Soft Skills – V	1	1	2	2	50	50	100
9	Core	ECS591	Industrial Training	0	0	0	2	50	50	100
Elective I – Select any one course										
10	Non-core	ECS506	ERP System	3	1	0	4	40	60	100
		ECS507	Mobile Communication							
		ECS509	Multimedia & Animation							
11	Non-core	EGP511	Discipline & General Proficiency	1	0	0	1	100	--	100
Total				20	7	10	33	540	560	1100

Semester VI

<i>S. No</i>	<i>Category (Core & Non-core)</i>	<i>Course Code</i>	<i>Subject</i>	<i>Periods</i>			<i>Credit</i>	<i>Evaluation Scheme</i>		
				<i>L</i>	<i>T</i>	<i>P</i>		<i>Internal</i>	<i>External</i>	<i>Total</i>
1	Core	ECS601	Artificial Intelligence	3	1	0	4	40	60	100
2	Non-core	ECS603	Computer Graphics	3	1	0	4	40	60	100
3	Core	ECS608	Computer Network	3	1	0	4	40	60	100
4	Non-core	EHM 649	English Communication & Soft Skills – VI	1	1	2	2	40	60	100
5	Non-core	ECS610	Cyber Law & Information Security	3	1	0	4	40	60	100
6	Non-core	ECS 651	Artificial Intelligence (Lab)	0	0	4	2	50	50	100
7	Non-core	ECS653	Computer Graphics (Lab)	0	0	4	2	50	50	100
8	Core	ECS654	Computer Network (Lab)	0	0	4	2	50	50	100
Elective II – Select any one course										
9	Non-core	ECS606	Real Time Operating System	3	1	0	4	50	50	100
		ECS607	Soft Computing							
	Non-core	EEC606	Microprocessor & Application							
		ECS609	E-commerce							
		ECS 611	Big Data Analytics							
10	Non-core	EGP611	Discipline & General Proficiency	1	0	0	1	100	--	100
			Total	17	6	14	29	500	500	1000

Semester VII

S. No .		Course Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	Non-core	ECS701	Web Technology (Design and Architecture using .NET)	3	1	0	4	40	60	100
2	Core	ECS703	Cryptography andNetwork Security	3	1	0	4	40	60	100
3	Core	ECS704	Software Project Management	3	1	0	4	40	60	100
4	Core	ECS751	Web Technology(Design and Architecture using .NET) (Lab)	0	0	4	2	50	50	100
5	Non-core	ECS752	Cryptography and Network Security (Lab)	0	0	4	2	50	50	100
Elective III – Select any one course										
6		ECS 711	Pattern Recognition	3	0	0	3	40	60	100
		ECS 712	Neural Network							
		EHM 703	Industrial Psychology							
	Non-core	ECS706	Natural Language Processing							
Elective IV – Select any one course										
7	Non Core	ECS713	Data Compression	3	1	0	4	40	60	100
	Non Core	ECS708	Simulation and Modeling							
	Non Core	ECS709	Cloud Computing							
	Non Core	ECS 714	Python							
8	Core	ECS791	Industrial Training & Presentation	0	0	0	4	50	50	100
9	Core	ECS799	Project Work Phase-1	0	0	8	4	50	50	100
10		EGP711	Discipline & General Proficiency	1	0	0	1	100	--	100
			Total	16	4	16	32	500	500	1000

Semester VIII

S. N o.	Category (Core & Non-core)	Course Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	Core	ECS801	Data Warehousing and Data	3	1	-	4	40	60	100
2	Non-core	ECS805	Distributed System	3	1	-	4	40	60	100
3	Core	ECS806	Android Programming	3	1	-	4	40	60	100
4	Non-core	ECS807	Concepts of IoT (Internet of Things)	3	-	-	3	40	60	100
Elective V – Select any one course										
5	Non-Core	ECS803	Digital Image Processing	3	1	0	4	40	60	100
		ECS804	Management Information System							
		ECS808	R-Programming							
Elective V - Lab – Same as one selected from column above										
9	Non-Core	ECS 852	Digital Image Processing (Lab)	0	0	4	2	50	50	100
		ECS 853	Management Information System (Lab)							
10	Non-Core	ECS 851	Data Warehousing and Data Mining (Lab)	0	0	4	2	50	50	100
	Non-Core	ECS854	Android Programming (Lab)	0	0	4	2	50	50	100
	Core	ECS 899	Project Work Phase-2	0	0	16	8	50	50	100
		EGP811	Discipline & General Proficiency	1	0	0	1	100	--	100
			Total	16	5	28	35	500	500	1000

Semester I

Engineering Mathematics-I

Course Code: EAS116

L T P C
3 1 0 4

Objective:

- To familiarize the basics of matrices, differential calculus, multiple integrals and vector calculus.
- To solve all problems related to matrices, calculus and vectors.

Course Outcomes:

On successful completion of this course, students will be able to:

- Calculate eigenvalues and eigenvectors, apply Caley-Hamilton theorem, and diagonalize of symmetric matrices and demonstrate the nature of quadratic forms.
- Demonstrate understanding of
- the derivatives of functions of several variables, viz., partial and total differentiation, and differentiation of implicit functions and optimize the functions of several variables.
- Evaluate double integration and triple integration using Cartesian, polar co-ordinates and the concept of Jacobian of transformation from one coordinate system to another coordinate system.
- Identify the improperness in integrals and evaluate the integrals using appropriate mathematical tools and how to apply beta and gamma integrals keeping improperness in mind.
- Perform gradient, divergence and curl operations in vector and scalar fields, apply Green's theorem, Gauss Theorem, and Stokes theorem as the generalization of fundamental theorem of Integral calculus.

Unit A (Unit A is for building a foundation and shall not be a part of examination)

Some general theorem on deviation-Derivative of the sum or difference of two function, Derivative of product of two functions, Derivative of quotient, Derivative of Trigonometry function, Derivative of inverse Trigonometry function, Logarithms differential, Integration of $1/x$, e^x , Integration by simple substitution. Integrals of the type $f'(x)$, $[f(x)]^n$, $\frac{f'(x)}{f(x)}$,

Integration of $1/x$, e^x , $\tan x$, $\cot x$, $\sec x$, $\operatorname{cosec} x$, Integration by parts, Integration using partial fractions.

Course Contents-

Unit I

(Lectures 08)

Determinants- Rules of computation; Linear Equations and Cramer's rule.

Matrices: Elementary row and column transformation; Rank of matrix; Linear dependence; Consistency of linear system of equations; Characteristic equation; Cayley-Hamilton Theorem (without proof); Eigen values and Eigen vectors; Complex and Unitary matrices.

Unit II

(Lectures 08)

Differential Equation--First order first degree Differential equation: variable separable, Homogeneous method, Linear differential equation method, Exact Differential equation.

Unit III

(Lectures 08)

Differential Calculus: Leibnitz theorem; Partial differentiation; Euler's theorem; Change of variables; Expansion of function of several variables. Jacobians, Error function.

Unit IV

(Lectures 08)

Multiple Integrals: Double integral, Triple integral, Beta and Gamma functions; Dirichlet theorem for three variables, Liouville's Extension of Dirichlet theorem.

Unit V

(Lectures 08)

Vector Differentiation:

Vector function, Differentiation of vectors, Formulae of Differentiation, Scalar and Vector point function, Geometrical Meaning of Gradient, Normal and Directional Derivative, Divergence of a vector function, Curl of a vector

Vector Integration:

Green's theorem, Stokes' theorem; Gauss' divergence theorem.

Text Books-

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

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

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

Semester I Engineering Physics-I

Course Code: EAS112/212

L T P C

3 1 0 4

Objective: To understand the fundamentals of physics like interference of light, diffraction, Polarization, elements of material science, special theory of relativity etc.

Course Outcome:

Students undergoing this course will have a fundamental understanding of basic physics concepts and its applications in a day to day life & also able to explain the basic understandings of the special theory of relativity, Polarization, elements of material science.

Unit A (Unit A is for building a foundation and shall not be a part of examination)

Optics- Properties of light, Lens, Mirror, Focal length, Intensity, Power, Eye-piece, Work, Energy and its types, Waves, longitudinal and transverse waves, Time period, Frequency

Course Contents-

Unit-I

(08 Lectures)

Interference of Light: Introduction, Principle of Superposition, Interference due to division of wavefront: Young's double slit experiment, Theory of Fresnel's Bi-Prism, Interference due to division of amplitude: parallel thin films, Wedge shaped film, Michelson's interferometer, Newton's ring.

Unit-II

(08 Lectures)

Diffraction: Introduction, Types of Diffraction and difference between them, Condition for diffraction, difference between interference and diffraction. **Single slit diffraction:** Quantitative description of maxima and minima with intensity variation, linear and angular width of central maxima. **Resolving Power:** Rayleigh's criterion of resolution, resolving power of diffraction grating and telescope.

Unit-III

(08 Lectures)

Polarization: Introduction, production of plane polarized light by different methods, Brewster's and Malus Law. Quantitative description of double refraction, Nicol prism, Quarter & half wave plate, specific rotation, Laurent's half shade polarimeter.

Unit-IV

(08 Lectures)

Elements of Material Science: Introduction, Bonding in solids, Covalent bonding and Metallic bonding, Classification of Solids as Insulators, Semi-Conductor and Conductors, Intrinsic and Extrinsic Semiconductors, Conductivity in Semiconductors, Determination of Energy gap of Semiconductor. **Hall Effect:** Theory, Hall Coefficients and application to determine the sign of charge carrier, Concentration of charge carrier, mobility of charge carriers.

Unit-V

(08 Lectures)

Special Theory of Relativity: Introduction, Inertial and non-inertial frames of Reference, Postulates of special theory of relativity, Galilean and Lorentz Transformations, Length contraction and Time Dilation, Relativistic addition of velocities, Variation of mass with velocity, Mass-Energy equivalence.

Text Books:

1. Elements of Properties of Matter, D. S. Mathur, S. Chand & Co.
2. Engineering Physics, Bhattacharya & Tandon, Oxford University Press.
3. Optics, Ajay Ghatak, Tata Mc Graw-Hill.
4. H. K. Malik & A.K. Singh, Engineering Physics, McGraw-Hill, latest edition.

Reference Books:

1. F. A. Jenkins and H. E. White, Fundamentals of Optics, McGraw-Hill.
2. Concept of Modern Physics, Beiser, Tata McGraw-Hill.
3. R. Resnick, Introduction to Special Relativity, John Wiley, Singapore.

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

Semester I Engineering Chemistry

Course Code: EAS113/213

L T P C
3 1 0 4

Objective:

The basic objective of Engineering Chemistry is to educate the students about the chemical aspects of engineering and to provide leadership in advanced studies of engineering, in industry, academia and government.

Course Outcomes:

Student after successful completion of course must possess skills to think critically and analyze chemical problems. Students are also expected to learn solving chemistry problems with an engineering purview. Laboratory work is intended for students to learn conducting experiments, and analyze experimental data.

Course Contents:

UNIT I

(Lecture 08)

Water and Its Industrial Applications: Sources, Impurities, Hardness and its units, Industrial water, characteristics, softening of water by various methods (External and Internal treatment), Boiler trouble causes effects and remedies, Characteristic of municipal water and its treatment, Numerical problem based on water softening method like lime soda, calgon etc.

UNIT II

(Lecture 08)

Fuels and Combustion: Fossil fuel and classification, calorific value, determination of calorific value by Bomb and Junker's calorimeter, proximate and ultimate analysis of coal and their significance, calorific value computation based on ultimate analysis data, Combustion and its related numerical problems carbonization manufacturing of coke, and recovery of byproduct, knocking relationship between knocking and structure and hydrocarbon, improvement and knocking characteristic IC Engine fuels, Diesel Engine fuels, Cetane Number.

UNIT III

(Lecture 08)

Lubricants: Introduction, mechanism of lubrication, classification of lubricant, properties and testing of lubricating Oil Numerical problem based on testing methods. **Cement and Refractories:** Manufacture, IS code, Setting and hardening of cement, Portland cement Plaster of Paris, **Refractories.** Introduction, classification and properties of refractories.

UNIT IV

(Lecture 08)

Polymers: Introduction, types and classification of polymerization, reaction mechanism, Natural and synthetic rubber, Vulcanization of rubber, preparation, properties and uses of the following Polythene, PVC, PMMA, Teflon, Polyacrylonitrile, PVA, Nylon 6, Terylene, Phenol Formaldehyde, Urea Formaldehyde Resin, Glyptal, Silicones Resin, Polyurethanes, Butyl Rubber, Neoprene, Buna N, Buna S.

UNIT V

(Lecture 08)

A. Instrumental Techniques in chemical analysis: Introduction, Principle, Instrumentation and application of IR, NMR, UV, Visible, Gas Chromatography, Lambert and Beer's Law.

B. Water Analysis Techniques: Alkalinity, Hardness (Complexometric), Chlorides, Free Chlorine, DO, BOD, and COD, Numerical Problem Based on above techniques.

Text Books:

1. Agarwal R. K., Engineering Chemistry, Krishna Prakashan.
2. Lee I.D., Inorganic Chemistry.
3. Chawla Shashi, Engineering Chemistry, Dhanpat Rai Publication.

Reference Books:

1. Morrison & Boyd, Organic Chemistry, Prentice Hall
2. Barrow Gordon M., Physical Chemistry, McGraw-Hill.
3. Manahan Stanley E., Environmental Chemistry, CRC Press.

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

Semester I Basic Electrical Engineering

Course Code: EEE117/217

L T P C
3 1 0 4

Objective- To understand the fundamental concept of Electrical Engineering like D.C. Network, A.C. Network, Measuring Instruments, Energy Conversion Devices etc.

Course Outcome:

- Students are expected to learn the physical recognition of different electrical components like Resistances, Inductances, Capacitances and their ratings.
- Students are expected to have learnt the verifications of basic laws of electric circuits like Ohm's law and Kirchhoffs' laws.
- Students are expected to connect electric circuits, and able to use electric instruments to perform experiments.
- Cite the operating principles and identify various ac, dc machines and transformers.

Course Contents-

Unit I

(Lectures 10)

D.C. Network Theory: Passive, active, bilateral, unilateral, linear, nonlinear element, Circuit theory concepts-Mesh and node analysis; Voltage and current division, source transformation, Network Theorems- Superposition theorem, Thevenin's theorem, Norton's theorem, and Maximum Power Transfer theorem, Star-delta & delta-star conversion.

Unit II

(Lectures 10)

Steady State Analysis of A.C. Circuits: Sinusoidal and phasor representation of voltage and Current; Single phase A.C. circuit behavior of resistance, inductance and capacitance and their Combination in series & parallel; Power factor; Series and parallel resonance; Band width and Quality factor.

Unit III

(Lectures 06)

Basics of Measuring Instruments: Introduction to voltmeter, ammeter, Wattmeter & Energy meter.

Unit IV

(Lectures 06)

Single phase Transformer: Principle of operation; Types of construction; Phasor diagram; Equivalent circuit; Efficiency and losses.

Unit V

(Lectures 08)

Three Phase A.C. Circuits: Line and phase voltage/current relations; three phase power, power measurement using two wattmeter method. Introduction to earthing and electrical safety.

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.
3. Nagrath I.J., Basic Electrical Engineering, Tata McGraw Hill.

Reference Books-

1. Fitzgerald A.E & Higginbotham., D.E., Basic Electrical Engineering, McGraw Hill.
2. 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
Basic Electronics Engineering

Course Code: EEC111/211

L T P C
3 1 0 4

Objective- To understand the basic concept of Electronics Engineering like p-n Junction, Bipolar Junction Transistor, Field Effect Transistor, Operational Amplifier and switching theory.

Course Outcomes:

On successful completion of this course students will be able to:

- Enumerate the basics of electric circuit elements, related terminologies and fundamental laws governing the operation and analysis of those circuits with DC sources and laws, and also concepts related to magnetic circuits.
- Illustrate common solid-state devices & access their characteristic and explain the basic of logic gates.

Course Contents

UNIT I

(Lectures 08)

p-n Junction: Energy band diagram in materials, Intrinsic & Extrinsic Semiconductor, Introduction to PN-Junction, Depletion layer, V-I characteristics, p-n junction as rectifiers (half wave and full wave), calculation of ripple factor of rectifiers, clipping and clamping circuits, Zener diode and its application as shunt regulator.

UNIT II

(Lectures 08)

Bipolar Junction Transistor (BJT): Basic construction, transistor action; CB, CE and CC configurations, input/output characteristics, Relation between α , β & γ , Biasing of transistors: Fixed bias, emitter bias, potential divider bias.

UNIT III

(Lectures 08)

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

UNIT IV

(Lectures 08)

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

UNIT V

(Lectures 08)

Switching Theory: Number system, conversion of bases (decimal, binary, octal and hexadecimal numbers), Addition & Subtraction, BCD numbers, Boolean algebra, De Morgan's Theorems, Logic gates and truth table- AND, OR & NOT, Seven segment display & K map.

Text Books-

1. Robert Boylestad & Louis Nashelsky, Electronic Circuit and Devices, Pearson India.
2. Millman & Halkias, Integrated Electronics, McGraw Hill.

3. Millman & Halkias, Electronics Devices and Circuits, McGraw Hill.
4. Morris Mano M., Digital Design, Prentice Hall.

Reference Books-

1. Sedra and Smith, Microelectronic Circuits, Oxford University Press.
2. Gayakwad, R A, Operational Amplifiers and Linear Integrated circuits, Prentice Hall of India Pvt. Ltd.
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

Environmental Studies

Course Code: EAS115/BAS214/BAS328/BAS428L T P C
1 2 0 2

Objective: To create awareness among students about environment protection.

Course Outcomes:

Based on this course, the Engineering graduate will understand / evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development.

CourseContent:

Unit I (Lectures 08)

Definition and Scope of environmental studies, multidisciplinary nature of environmental studies, Concept of sustainability & sustainable development.

Ecology andEnvironment: Concept of an Ecosystem-its structure and functions, Energy Flow in an Ecosystem, Food Chain, Food Web, Ecological Pyramid & Ecological succession, Study of following ecosystems: Forest Ecosystem, Grass land Ecosystem & Aquatic Ecosystem & Desert Ecosystem.

Unit II (Lectures 08)

Natural Resources: Renewable & Non-Renewable resources; Land resources and land use change; Land degradation, Soil erosion & desertification. **Deforestation:** Causes & impacts due to mining, Dam building on forest biodiversity & tribal population. **Energy Resources:** Renewable & Non-Renewable resources, Energy scenario & use of alternate energy sources, Case studies.

Biodiversity: Hot Spots of Biodiversity in India and World, Conservation, Importance and Factors Responsible for Loss of Biodiversity, Biogeographical Classification of India

Unit III (Lectures 08)

Environmental Pollutions: Types, Causes, Effects & control; Air, Water, soil & noise pollution, Nuclear hazards & human health risks, Solid waste Management; Control measures of urban & industrial wastes, pollution case studies

Unit IV (Lectures 08)

Environmental policies & practices: Climate change & Global Warming (Greenhouse Effect), Ozone Layer -Its Depletion and Control Measures, Photochemical Smog, Acid Rain Environmental laws: Environment protection Act; air prevention & control of pollution act, Water Prevention & Control of Pollution Act, Wild Life Protection Act, Forest Conservation Acts, International Acts; Montreal & Kyoto Protocols & Convention on biological diversity, Nature reserves, tribal population & Rights & human wild life conflicts in Indian context

Unit V (Lectures 08)

Human Communities & Environment:

Human population growth; impacts on environment, human health & welfare, Resettlement & rehabilitation of projects affected person: A case study, Disaster Management; Earthquake, Floods & Droughts, Cyclones & Landslides, Environmental Movements; Chipko, Silent Valley, Vishnoi's of Rajasthan, Environmental Ethics; Role of Indian & other regions & culture in environmental

Field Work:

1. Visit to an area to document environmental assets; river/forest/flora-fauna etc.
2. Visit to a local polluted site: urban/ rural/industrial/agricultural.
3. Study of common plants, insects, birds & basic principles of identification.
4. Study of simple ecosystem; pond, river etc.

Text Books:

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

Reference Books:

1. “Biodiversity and Conservation”, Bryant, P. J., Hypertext Book
2. “Textbook of Environment Studies”, Tewari, Khulbe & Tewari, I.K. Publication

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

Semester I

English Communication and Soft Skills – I

Course Code: EHM199/BHM199

L T P C

1 1 2 2

Objectives:

1. To remove the phobia of conversing in English.
2. To make the learners enable to express themselves among peers & teachers.
3. To enable learners, improve their vocabulary.
4. To introduce them with basic communicative skills in real life situations

Course Outcomes: At the end of the semester, the learner will be able to

1. Remove fear of speaking in English among peers & teachers.
2. Develop the ability to speak in English (even if grammatically not perfect).
3. Use vocabulary taught for speaking and writing simple sentence for day to day conversation.
4. Use taught vocabulary for writing applications on common issues.

Course Contents:

Unit – I Fear of Failure, Reasons of Fear of Failure & How to overcome it (12 hours)

- Self-Introduction
- Identifying strengths and weakness
- Fear of Failure: Signs of Fear of Failure, Reasons of Fear of Failure, Strategies to overcome Fear of Failure
- Positive Attitude
- Motivation
- Building Self Confidence

Unit – II Confidence, Presentability, Etiquettes & Manners (10 hours)

- Body Language: Facial Expression, Eye Contact, Gesture, Posture, Tips to have appropriate body language
- Grooming & Dressing Sense
- Etiquette & Manners: Social Etiquettes, Telephonic Etiquettes, Dining Etiquettes, Etiquettes to handle cultural differences, Etiquettes of Effective Conversation.
- Problem Sounds (s-sh,j-z,v-b)

Unit – III Conversation Practice, commonly made mistake & Initiating a conversation (10 hours)

- Vocabulary of commonly used words (50 Words)
- Conversation Practice: At College, At Bank, At Ticket Counter (Railway Station & Movie Theatre)

- How to initiate a conversation
- Commonly made mistakes in conversation
- Basic of Communication: 7Cs of Communication

Unit – IV Application writing

(08 hours)

- Format & Style of Application Writing
- Practice of Application writing on common issues.

Reference Books:

- Mitra, Barun. K. “*Personality Development and Soft skills*” New Delhi: Oxford University Press.
- Kumar, Sanjay. & Pushp Lata. “*Communication Skills*” New Delhi: Oxford University Press.
- Carnegie Dale. “*How to win Friends and Influence People*” New York: Simon & Schuster.
- Harris, Thomas. A. “*I am ok, You are ok*” New York: Harper and Row.
- Coleman, Daniel. “*Emotional Intelligence*” Bantam Book.

Methodology:

1. Language Lab software.
2. The content will be conveyed through Real life situations, Pair Conversation, Group Talk and Class Discussion.
3. Conversational Practice will be effectively carried out by Face to Face & Via Media (Telephone, Audio-Video Clips)
4. Modern Teaching tools (PPT Presentation, Tongue-Twisters & Motivational videos with sub-titles) will be utilized.

Note:

- 2 words per class will be taught with meaning, usage & correct pronunciation to ensure progressive learning.
- Class (above 30 students) will be divided in to two groups for effective teaching.
- For effective conversation practice, groups will be changed weekly.

Evaluation Scheme

Internal Evaluation		External Evaluation		Total Marks
50 Marks		50 Marks		100
40 Marks (Progressive Evaluation) After each unit-completion: Assignments / oral Presentation	10 Marks (Attendance)	25 Marks Midway external assessment (Viva)*	25 Marks (External Viva)**	

Note: Midway external assessment of 25 marks will be submitted and considered with external evaluation with a total of 50 marks.

***Parameters of Midway external assessment (Viva)**

Content	Dressing sense & Grooming	Confidence	Pronunciation	Question responsiveness	TOTAL
05 Marks	05 Marks	05 Marks	05 Marks	05 Marks	25 Marks

Note: To take corrective actions, midway assessment will be conducted by 2-member committee of Director's nominee (not by the faculty teaching English courses) and average of the two would be the 25 marks obtained by the students after two units are completed.

****Parameters of External Viva**

Content	Dressing sense & Grooming	Confidence	Pronunciation	Question responsiveness	TOTAL
05 Marks	05 Marks	05 Marks	05 Marks	05 Marks	25 Marks

Note: External Viva will be conducted by 3-member committee comprising

- a) Faculty teaching the class*
- b) English faculty from other college of the University (As approved by VC).*
- c) T&P officer of other colleges of the University (As approved by VC).*

Each member will evaluate on a scale of 25 marks and the average of three would be the 25 marks obtained by the students.

Semester I

Engineering Physics (Lab)

Course Code: EAS162/262

L T P C
0 0 2 1

LIST OF EXPERIMENTS:

Note: Select any ten experiments from the following list.

1. To determine the wavelength of monochromatic light by Newton's ring.
2. To determine the wavelength of monochromatic light by Michelson-Morley experiment.
3. To determine the wavelength of monochromatic light by Fresnel's Bi-prism.
4. To determine the Planck's constant using LEDs of different colours.
5. To determine the specific rotation of cane sugar solution using Polarimeter.
6. To verify Stefan's Law by electrical method.
7. To study the Hall Effect and determine Hall coefficient and mobility of a given semiconductor material using Hall-effect set up.
8. To determine the Frequency of an Electrically Maintained Tuning Fork by Melde's experiment.
9. To compare Illuminating Powers by a Photometer.
10. To determine the frequency of A.C. mains by means of a Sonometer.
11. To determine refractive index of a prism material by spectrometer.
12. To determine the Flashing & Quenching of Neon bulb.
13. Determination of Cauchy's constant by using spectrometer.
14. To study the PN junction characteristics.
15. To determine the resolving power and dispersive power by a prism.
16. To determine the value of Boltzmann Constant by studying Forward Characteristics of a Diode.
17. Study the characteristics of LDR.
18. To study the characteristics of a photo-cell.

Books:

1. B.Sc.Practical Physics, Gupta and Kumar, Pragati Prakashan.
2. B.Sc. Practical Physics, C.L. Arora, S. Chand & Company Pvt. Ltd.

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

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)
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Semester I
Engineering Chemistry (Lab)

Course Code: EAS163/263

L T P C
0 0 2 1

LIST OF EXPERIMENTS

Note: Select any ten experiments from the following list.

1. Determination of Total Hardness of a given water sample.
2. Determination of mixed alkalinity (a) Hydroxyl & Carbonate (b) Carbonate & Bicarbonate
3. To determine the pH of the given solution using pH meter and pH-metric titration.
4. Determination of dissolved oxygen content of given water sample.
5. To find chemical oxygen demand of waste water sample by potassium dichromate
6. Determination of free chlorine in a given water sample.
7. To determine the chloride content in the given water sample by Mohr's method.
8. To prepare the Bakelite resin polymer.
9. To determine the concentration of unknown sample of iron spectrophotometrically.
10. To determine the viscosity of a given sample of a lubricating oil using Redwood Viscometer.
11. To determine the flash & fire point of a given lubricating oil.
12. Determination of calorific value of a solid or liquid fuel.
13. Determination of calorific value of a gaseous fuel.
14. Determination of % of O₂, CO₂, % CO in flue gas sample using Orsat apparatus.
15. Proximate analysis of coal sample.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Semester I
Basic Electrical Engineering (Lab)

Course Code: EEE161/261

L T P C
0 0 2 1

List of Experiments-

Note: Select any ten experiments from the following list.

1. To verify the Kirchhoff's current and voltage laws.
2. To study multimeter.
3. To verify the Superposition theorem.
4. To verify the Thevenin's theorem.
5. To verify the Norton's theorem.
6. To verify the maximum power transfer theorem.
7. To verify current division and voltage division rule.
8. To measure energy by a single-phase energy meter.
9. To measure the power factor in an RLC by varying the capacitance
10. To determine resonance frequency, quality factor, bandwidth in series resonance.
11. To measure the power in a 3-phase system by two-wattmeter method
12. To measure speed for speed control of D.C. Shunt Motor.
13. To determine the efficiency of single-phase transformer by load test.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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.

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Semester I
Basic Electronics Engineering (Lab)

Course Code: EEC161/261

L T P C
0 0 2 1

List of Experiments:

Note: Minimum eight experiments should be performed-

1. To study the V-I characteristics of p-n junction diode.
2. To study the diode as clipper and clamper.
3. To study the half-wave rectifier using silicon diode.
4. To study the full-wave rectifier using silicon diode.
5. To study the Zener diode as a shunt regulator.
6. To study transistor in Common Base configuration & plot its input/output characteristics.
7. To study the operational amplifier in inverting & non-inverting modes using IC 741.
8. To study the operational amplifier as differentiator & integrator.
9. To study various logic gates & verify their truth tables.
10. To study half adder/full adder & verify their truth tables.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Semester I Engineering Drawing (Lab)

Course Code: EME161/261

L T P C
0 0 4 2

LIST OF EXPERIMENTS- [All to be performed]

1. To write all Numbers (0 to 9) and alphabetical Letters (A to Z) as per the standard dimensions.
2. To draw the types of lines and conventions of different materials.
3. To draw and study dimensioning and Tolerance.
4. To construction geometrical figures of Pentagon and Hexagon
5. To draw the projection of points and lines
6. To draw the Orthographic Projection of given object in First Angle
7. To draw the Orthographic Projection of given object in Third Angle
8. To draw the sectional view of a given object
9. To draw the development of the lateral surface of given object
10. To draw the isometric projection of the given orthographic projection.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the drawing sheet by the students and a Viva taken by the faculty concerned. The marks shall be given on the drawing sheet & regard maintained by the faculty.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

Drawing Sheet (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)
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Note: The drawing sheet could be manual or in Auto CAD.

Semester I
Workshop Practice (Lab)

Course Code: EME162/262

L T P C
0 0 4 2

List of Experiments:

(Perform any ten experiments selecting at least one from each shop.)

Carpentry Shop:

1. To prepare half-lap corner joint.
2. To prepare mortise & tenon joint.
3. To prepare a cylindrical pattern on woodworking lathe.

Fitting Bench Working Shop:

1. To prepare a V-joint fitting
2. To prepare a U-joint fitting
3. To prepare a internal thread in a plate with the help of tapping process

Black Smithy Shop:

1. To prepare a square rod from given circular rod
2. To prepare a square U- shape from given circular rod

Welding Shop:

1. To prepare a butt and Lap welded joints using arc welding machine.
2. To prepare a Lap welded joint Gas welding equipment.
3. To prepare a Lap welded joint using spot welding machine.

Sheet-metal Shop:

1. To make round duct of GI sheet using 'soldering' process.
2. To prepare a tray of GI by fabrication

Machine Shop:

1. To study the working of basic machine tools like Lathe m/c, Shaper m/c, Drilling m/c and Grinding m/c.
2. To perform the following operations on Centre Lathe:
Turning, Step turning, Taper turning, Facing, Grooving and Knurling
3. To perform the operations of drilling of making the holes on the given metallic work-piece (M.S.) by use of drilling machine.

Foundry Shop:

1. To prepare core as per given size.
2. To prepare a mould for given casting.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Semester I

DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP111

L T P C

0 0 0 0

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

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

The above is 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).

Head of Department would be display GP marks on notice board in prescribed format after IInd & IIIrd CT in semester:

S N o	Enroll No.	Student Name	Dress code	Participation in Conferences /Workshops / Seminars	Participation in guest lectures, invited talks and special technical sessions	Participation in community Services	Participation in Culture & extra curriculum activities, Department Club Activities	Participation in sports/ co- curricular activities	General Behavior	Any Extra Achievement
			(5)	(15)	(20)	(10)	(20)	(20)	(5)	(5)
Responsible for marks			Mentor	Head	Head	Mentor	Cultural Events Coordinator & Department Club Coordinator	Sports Coordinator	Mentor	Director or Principal

Semester II

Engineering Mathematics- II

Course Code: EAS211

L T P C
3 1 0 4

Objective:

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

Course Outcome: On successful completion of this course, students will be able to:

- Take Laplace transformation of different types of functions, derivatives and integrals, and how it converts complex systems into simple algebraic equations to find out solutions.
- Demonstrate the understanding of solving ordinary differential equations using operator methods, method of undetermined coefficients, method of variation of parameters and Laplace transformation techniques.

Course Contents-

Unit I

(Lectures 08)

Differential Equations: Linear Differential Equation, Linear Differential Equation with constant coefficient: Complementary functions and particular integrals, Linear Differential Equation with variable coefficient: Removal method, changing independent variables, Method of variation of parameters, Homogeneous Linear Differential Equation, Simultaneous linear differential equations.

Unit II

(Lectures 08)

Series Solutions: PowerSeries solutions of ODE, Ordinary Point, Singular Points, Frobenius Method.

Special Functions: Legendre equation and Polynomial, Legendre Function, Rodrigue's formula, Laplace definite integral for first and second kind, Bessel equation and Polynomial, Bessel Function, Orthogonal properties and Recurrence Relation for Legendre and Bessel function.

Unit III

(Lectures 08)

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.

Unit IV

(Lectures 08)

Fourier Series: Periodic functions, Trigonometric series; Fourier series; Dirichlet's conditions, Determination of fourier coefficient by Euler's formulae; Fourier series for discontinuous functions, Even and odd functions, Half range sine and cosine series.

Unit V

(Lectures 08)

Laplace Transform: Laplace transform; Existence theorem; Laplace transform of derivatives and integrals; Inverse Laplace transform; Unit step function; Diratch delta function; Laplace transform of periodic functions; Convolution theorem.

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-II, S. Chand.

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-II, Laxmi Publications.

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

Semester II Engineering Physics-I

Course Code: EAS212/112

L T P C

3 1 0 4

Objective: To understand the fundamentals of physics like interference of light, diffraction, Polarization, elements of material science, special theory of relativity etc.

Course Outcome:

Students undergoing this course will have a fundamental understanding of basic physics concepts and its applications in a day to day life & also able to explain the basic understandings of the special theory of relativity, Polarization, elements of material science.

Unit A (Unit A is for building a foundation and shall not be a part of examination)

Optics- Properties of light, Lance, Mirror, Focal length, Intensity, Power, Eye-piece, Work, Energy and its types, Waves, longitudinal and transverse waves, Time period, Frequency

Course Contents-

Unit-I

(08 Lectures)

Interference of Light: Introduction, Principle of Superposition, Interference due to division of wavefront: Young's double slit experiment, Theory of Fresnel's Bi-Prism, Interference due to division of amplitude: parallel thin films, Wedge shaped film, Michelson's interferometer, Newton's ring.

Unit-II

(08 Lectures)

Diffraction: Introduction, Types of Diffraction and difference between them, Condition for diffraction, difference between interference and diffraction. **Single slit diffraction:** Quantitative description of maxima and minima with intensity variation, linear and angular width of central maxima. **Resolving Power:** Rayleigh's criterion of resolution, resolving power of diffraction grating and telescope.

Unit-III

(08 Lectures)

Polarization: Introduction, production of plane polarized light by different methods, Brewster's and Malus Law. Quantitative description of double refraction, Nicol prism, Quarter & half wave plate, specific rotation, Laurent's half shade polarimeter.

Unit-IV

(08 Lectures)

Elements of Material Science: Introduction, Bonding in solids, Covalent bonding and Metallic bonding, Classification of Solids as Insulators, Semi-Conductor and Conductors, Intrinsic and Extrinsic Semiconductors, Conductivity in Semiconductors, Determination of Energy gap of Semiconductor. **Hall Effect:** Theory, Hall Coefficients and application to determine the sign of charge carrier, Concentration of charge carrier, mobility of charge carriers.

Unit-V

(08 Lectures)

Special Theory of Relativity: Introduction, Inertial and non-inertial frames of Reference, Postulates of special theory of relativity, Galilean and Lorentz Transformations, Length contraction and Time Dilation, Relativistic addition of velocities, Variation of mass with velocity, Mass-Energy equivalence.

Text Books:

1. Elements of Properties of Matter, D. S. Mathur, S. Chand & Co.
2. Engineering Physics, Bhattacharya & Tandon, Oxford University Press.
3. Optics, Ajay Ghatak, Tata Mc Graw-Hill.
4. H. K. Malik & A.K. Singh, Engineering Physics, McGraw-Hill, latest edition.

Reference Books:

1. F. A. Jenkins and H. E. White, Fundamentals of Optics, McGraw-Hill.
2. Concept of Modern Physics, Beiser, Tata McGraw-Hill.
3. R. Resnick, Introduction to Special Relativity, John Wiley, Singapore.

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

Semester II Engineering Chemistry

Course Code: EAS213/113

L T P C
3 1 0 4

Objective:

The basic objective of Engineering Chemistry is to educate the students about the chemical aspects of engineering and to provide leadership in advanced studies of engineering, in industry, academia and government.

Course Outcomes:

Student after successful completion of course must possess skills to think critically and analyze chemical problems. Students are also expected to learn solving chemistry problems with an engineering purview. Laboratory work is intended for students to learn conducting experiments, and analyze experimental data.

Course Contents:

UNIT I

(Lecture 08)

Water and Its Industrial Applications: Sources, Impurities, Hardness and its units, Industrial water, characteristics, softening of water by various methods (External and Internal treatment), Boiler trouble causes effects and remedies, Characteristic of municipal water and its treatment, Numerical problem based on water softening method like lime soda, calgon etc.

UNIT II

(Lecture 08)

Fuels and Combustion: Fossil fuel and classification, calorific value, determination of calorific value by Bomb and Jumker's calorimeter, proximate and ultimate analysis of coal and their significance, calorific value computation based on ultimate analysis data, Combustion and its related numerical problems carbonization manufacturing of coke, and recovery of byproduct, knocking relationship between knocking and structure and hydrocarbon, improvement ant knocking characteristic IC Engine fuels, Diesel Engine fuels, Cetane Number.

UNIT III

(Lecture 08)

Lubricants: Introduction, mechanism of lubrication, classification of lubricant, properties and testing of lubricating Oil Numerical problem based on testing methods. **Cement and Refractories:** Manufacture, IS code, Setting and hardening of cement, Portland cement Plaster of Paris, **Refractories.** Introduction, classification and properties of refractories.

UNIT IV

(Lecture 08)

Polymers: Introduction, types and classification of polymerization, reaction mechanism, Natural and synthetic rubber, Vulcanization of rubber, preparation, properties and uses of the following Polythene, PVC, PMMA, Teflon, Polyacrylonitrile, PVA, Nylon 6, Terylene, Phenol Formaldehyde, Urea Formaldehyde Resin, Glyptal, Silicones Resin, Polyurethanes, Butyl Rubber, Neoprene, Buna N, Buna S.

UNIT V

(Lecture 08)

A. Instrumental Techniques in chemical analysis: Introduction, Principle, Instrumentation and application of IR, NMR, UV, Visible, Gas Chromatography, Lambert and Beer's Law.

B. Water Analysis Techniques: Alkalinity, Hardness (Complexometric), Chlorides, Free Chlorine, DO, BOD, and COD, Numerical Problem Based on above techniques.

Text Books:

1. Agarwal R. K., Engineering Chemistry, Krishna Prakashan.
2. Lee I.D., Inorganic Chemistry.
3. Chawla Shashi, Engineering Chemistry, Dhanpat Rai Publication.

Reference Books:

1. Morrison & Boyd, Organic Chemistry, Prentice Hall
2. Barrow Gordon M., Physical Chemistry, McGraw-Hill.
3. Manahan Stanley E., Environmental Chemistry, CRC Press.

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

Semester II

Basic Electrical Engineering

Course Code: EEE217/117

L T P C
3 1 0 4

Objective- To understand the fundamental concept of Electrical Engineering like D.C. Network, A.C. Network, Measuring Instruments, Energy Conversion Devices etc.

Course Outcome:

- Students are expected to learn the physical recognition of different electrical components like Resistances, Inductances, Capacitances and their ratings.
- Students are expected to have learnt the verifications of basic laws of electric circuits like Ohm's law and Kirchhoffs' laws.
- Students are expected to connect electric circuits, and able to use electric instruments to perform experiments.
- Cite the operating principles and identify various ac, dc machines and transformers.

Course Contents-

Unit I

(Lectures 10)

D.C. Network Theory: Passive, active, bilateral, unilateral, linear, nonlinear element, Circuit theory concepts-Mesh and node analysis; Voltage and current division, source transformation, Network Theorems- Superposition theorem, Thevenin's theorem, Norton's theorem, and Maximum Power Transfer theorem, Star-delta & delta-star conversion.

Unit II

(Lectures 10)

Steady State Analysis of A.C. Circuits: Sinusoidal and phasor representation of voltage and current; Single phase A.C. circuit behavior of resistance, inductance and capacitance and their Combination in series & parallel; Power factor; Series and parallel resonance; Band width and Quality factor.

Unit III

(Lectures 06)

Basics of Measuring Instruments: Introduction to voltmeter, ammeter, Wattmeter & Energy meter.

Unit IV

(Lectures 06)

Single phase Transformer: Principle of operation; Types of construction; Phasor diagram; Equivalent circuit; Efficiency and losses.

Unit V

(Lectures 08)

Three Phase A.C. Circuits: Line and phase voltage/current relations; three phase power, power measurement using two wattmeter method. Introduction to earthing and electrical safety.

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.
3. Nagrath I.J., Basic Electrical Engineering, Tata McGraw Hill.

Reference Books-

1. Fitzgerald A.E & Higginbotham., D.E., Basic Electrical Engineering, McGraw Hill.
2. 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 II

Basic Electronics Engineering

Course Code: EEC211/111

L T P C
3 1 0 4

Objective- To understand the basic concept of Electronics Engineering like p-n Junction, Bipolar Junction Transistor, Field Effect Transistor, Operational Amplifier and switching theory.

Course Outcomes:

On successful completion of this course students will be able to:

- Enumerate the basics of electric circuit elements, related terminologies and fundamental laws governing the operation and analysis of those circuits with DC sources and laws, and also concepts related to magnetic circuits.
- Illustrate common solid-state devices & access their characteristic and explain the basic of logic gates.

Course Contents:

UNIT I

(Lectures 08)

p-n Junction: Energy band diagram in materials, Intrinsic & Extrinsic Semiconductor, Introduction to PN-Junction, Depletion layer, V-I characteristics, p-n junction as rectifiers (half wave and full wave), calculation of ripple factor of rectifiers, clipping and clamping circuits, Zener diode and its application as shunt regulator.

UNIT II

(Lectures 08)

Bipolar Junction Transistor (BJT): Basic construction, transistor action; CB, CE and CC configurations, input/output characteristics, Relation between α , β & γ , Biasing of transistors: Fixed bias, emitter bias, potential divider bias.

UNIT III

(Lectures 08)

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

UNIT IV

(Lectures 08)

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

UNIT V

(Lectures 08)

Switching Theory: Number system, conversion of bases (decimal, binary, octal and hexadecimal numbers), Addition & Subtraction, BCD numbers, Boolean algebra, De Morgan's Theorems, Logic gates and truth table- AND, OR & NOT, Seven segment display & K map.

Text Books-

1. Robert Boylestad & Louis Nashelsky, Electronic Circuit and Devices, Pearson India.
2. Millman & Halkias, Integrated Electronics, McGraw Hill.
3. Millman & Halkias, Electronics Devices and Circuits, McGraw Hill.
4. Morris Mano M., Digital Design, Prentice Hall.

Reference Books-

1. Sedra and Smith, Microelectronic Circuits, Oxford University Press.
2. Gayakwad, R A, Operational Amplifiers and Linear Integrated circuits, Prentice Hall of India Pvt. Ltd.
3. Chattopadhyay D and P C Rakshit, Electronics Fundamentals and Applications, New Age International.

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

Semester II

Computer Basics & C Programming

Course Code: ECS201

L T P C

3 0 0 3

Objective: To learn the basics of computers & C programming language.

Course Contents:

Unit I

(Lectures 08)

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.

Unit II

(Lectures 08)

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: Numeric and relation operators; logical operator; bit operator; operator precedence and associativity.

Unit III

(Lectures 08)

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, While Loop, loop inside a loop structure, Switch Statement. Break and default with switch.

Unit IV

(Lectures 08)

Concepts in Operating Systems: Elementary Concepts in Operating Systems; Textual Vs GUI Interface.

Arrays: Notation and representation; Manipulation of array elements; Multidimensional arrays.

Unit V

(Lectures 08)

Functions & Strings: Definition; Declaration; Call by Value; Call by Reference; Returns values and their types; Function calls.

Structure & Dynamic Memory Allocation: Structures and union, run time memory allocation functions, Introduction of preprocessor directives.

Text Books-

1. Sinha P. K., Computer Fundamentals, BPB Publications.
2. Yadav, DS, Foundations of IT, New Age.
3. Curtin, Information Technology: Breaking News, Tata McGraw Hill.

Reference Books-

1. Peter Nortans, Introduction to Computers, Tata McGraw Hill.

2. Yashavant Kanetkar, Let us C , BPB Publications.
 3. Leon & Leon, Fundamental of Information Technology, Vikas Publishing.
 4. Kanter, Managing Information System, Prentice-Hall.
- *Latest editions of all the suggested books are recommended.**

Semester II

English Communication and Soft Skills-II

Course Code: EHM249

L T P C

1 1 2 2

Objectives:

1. To enhance the vocabulary of learners to address competitive exams like GATE/PGT/TGT
2. To develop ability of sentence construction.
3. To enhance learner's writing ability.
4. To make the learner effective in presenting himself/herself.

Course Outcomes: At the end of the semester, the learner will be able to

1. Learn additional 100 words apart from 50 words learnt in preceding semester (3words/lecture)
2. Write letters effectively.
3. Acquire competence in constructing short sentences dealing day to day activities with grammatical accuracy.
4. Express themselves before class / in a group and attain proficiency in deliverance.
5. Acquire adequate knowledge of grammar to address competitive exams like GATE/PGT/TGT

Course Contents:

Unit – I Vocabulary & Grammar (14 hours)

- Homophones, Homonyms, Synonyms, Antonyms and one-word substitution.
- Parts of Speech, Modals, Tenses and Simple sentence construction.

Unit – II Listening Skills (05 hours)

- Difference between listening & hearing, Types of Listening, Process
- Importance and Barriers to listening

Unit – III Writing Skills (08 hours)

- Letters and Email writing
- Story Narration

Unit – IV Strategies & Structure of Presentation and Problem Sounds (13 hours)

- Managing Time, Audience & Locale, Structure and Organization of Content and 5 W's
- Problem Sounds: S- Sh, J-Z and V-B*

Reference Books:

- Nesfield J.C. “*English Grammar Composition & Usage*” Macmillan Publishers

- Sood Madan “*The Business letters*” Goodwill Publishing House, New Delhi
- Kumar Sanjay & Pushplata “*Communication Skills*” Oxford University Press, New Delhi.

Methodologies:

1. Words and exercises, usage in sentences.
2. Sentence construction on daily activities and conversations.
3. Format and layout to be taught with the help of samples and preparing letters on different subjects.
4. JAM sessions and Picture presentation.
5. Tongue twisters, Newspaper reading and short movies.

Note:

- 3 words per class will be taught with meaning, usage & correct pronunciation to ensure progressive learning.
- Class (above 30 students) will be divided in to two groups for effective teaching.
- For effective conversation practice, groups will be changed weekly.
- Repeated practice of sound.

Evaluation Scheme

Internal Evaluation		External Evaluation		Total Marks
40 Marks		60 Marks		100
30 Marks (Progressive Evaluation) After each unit-completion: Assignments / oral Presentation	10 Marks (Attendance)	20 Marks Midway external assessment (Oral Presentation) *	40 Marks (Written Examination)	

*** Parameters of Midway external assessment Oral Presentation**

Content	Pronunciation	Delivery of Content	Question responsiveness	TOTAL
05 Marks	05 Marks	05 Marks	05 Marks	20 Marks

Note:

Midway Assessment: *To take corrective actions, midway assessment will be conducted by 2-member committee of Director's nominee (not by the faculty teaching English courses) and average of the two would be the 20 marks obtained by the students after two units are completed. The marks in sealed envelope will be send to Examination Department.*

Written Examination: *There would be four questions with internal choice one from each unit of 10 marks*

Semester II

Engineering Physics (Lab)

Course Code: EAS262/162

L T P C
0 0 2 1

LIST OF EXPERIMENTS:

Note: Select any ten experiments from the following list.

1. To determine the wavelength of monochromatic light by Newton's ring.
2. To determine the wavelength of monochromatic light by Michelson-Morley experiment.
3. To determine the wavelength of monochromatic light by Fresnel's Bi-prism.
4. To determine the Planck's constant using LEDs of different colours.
5. To determine the specific rotation of cane sugar solution using Polarimeter.
6. To verify Stefan's Law by electrical method.
7. To study the Hall Effect and determine Hall coefficient and mobility of a given semiconductor material using Hall-effect set up.
8. To determine the Frequency of an Electrically Maintained Tuning Fork by Melde's experiment.
9. To compare Illuminating Powers by a Photometer.
10. To determine the frequency of A.C. mains by means of a Sonometer.
11. To determine refractive index of a prism material by spectrometer.
12. To determine the Flashing & Quenching of Neon bulb.
13. Determination of Cauchy's constant by using spectrometer.
14. To study the PN junction characteristics.
15. To determine the resolving power and dispersive power by a prism.
16. To determine the value of Boltzmann Constant by studying Forward Characteristics of a Diode.
17. Study the characteristics of LDR.
18. To study the characteristics of a photo-cell.

Books:

1. B.Sc. Practical Physics, Gupta and Kumar, Pragati Prakashan.
2. B.Sc. Practical Physics, C.L. Arora, S.Chand & Company Pvt. Ltd.

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

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (10 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)
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Semester II

Engineering Chemistry (Lab)

Course Code: EAS263/163

L T P C
0 0 2 1

LIST OF EXPERIMENTS

Note: Select any ten experiments from the following list.

1. Determination of Total Hardness of a given water sample.
2. Determination of mixed alkalinity (a) Hydroxyl & Carbonate (b) Carbonate & Bicarbonate
3. To determine the pH of the given solution using pH meter and pH-metric titration.
4. Determination of dissolved oxygen content of given water sample.
5. To find chemical oxygen demand of waste water sample by potassium dichromate
6. Determination of free chlorine in a given water sample.
7. To determine the chloride content in the given water sample by Mohr's method.
8. To prepare the Bakelite resin polymer.
9. To determine the concentration of unknown sample of iron spectrophotometrically.
10. To determine the viscosity of a given sample of a lubricating oil using Redwood Viscometer.
11. To determine the flash & fire point of a given lubricating oil.
12. Determination of calorific value of a solid or liquid fuel.
13. Determination of calorific value of a gaseous fuel.
14. Determination of % of O₂, CO₂ % CO in flue gas sample using Orsat apparatus.
15. Proximate analysis of coal sample.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Semester II

Basic Electrical Engineering (Lab)

Course Code: EEE261/161

L T P C
0 0 2 1

List of Experiments-

Note: Select any ten experiments from the following list.

1. To verify the Kirchhoff's current and voltage laws.
2. To study multimeter.
3. To verify the Superposition theorem.
4. To verify the Thevenin's theorem.
5. To verify the Norton's theorem.
6. To verify the maximum power transfer theorem.
7. To verify current division and voltage division rule.
8. To measure energy by a single-phase energy meter.
9. To measure the power factor in an RLC by varying the capacitance
10. To determine resonance frequency, quality factor, bandwidth in series resonance.
11. To measure the power in a 3-phase system by two-wattmeter method
12. To measure speed for speed control of D.C. Shunt Motor.
13. To determine the efficiency of single-phase transformer by load test.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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.

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Semester II

Basic Electronics Engineering (Lab)

Course Code: EEC261/161

L T P C
0 0 2 1

LIST OF EXPERIMENTS

Note: Minimum eight experiments should be performed-

1. To study the V-I characteristics of p-n junction diode.
2. To study the diode as clipper and clamper.
3. To study the half-wave rectifier using silicon diode.
4. To study the full-wave rectifier using silicon diode.
5. To study the Zener diode as a shunt regulator.
6. To study transistor in Common Base configuration & plot its input/output characteristics.
7. To study the operational amplifier in inverting & non-inverting modes using IC 741.
8. To study the operational amplifier as differentiator & integrator.
9. To study various logic gates & verify their truth tables.
10. To study half adder/full adder & verify their truth tables.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Semester II
Computer Basics & C Programming Lab

Course Code: ECS251

L T P C
0 0 2 1

LIST OF EXPERIMENTS-

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

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Semester II Engineering Drawing (Lab)

Course Code: EME261/161

L T P C
0 0 4 2

LIST OF EXPERIMENTS- [All to be performed]

1. To write all Numbers (0 to 9) and alphabetical Letters (A to Z) as per the standard dimensions.
2. To draw the types of lines and conventions of different materials.
3. To draw and study dimensioning and Tolerance.
4. To construction geometrical figures of Pentagon and Hexagon
5. To draw the projection of points and lines
6. To draw the Orthographic Projection of given object in First Angle
7. To draw the Orthographic Projection of given object in Third Angle
8. To draw the sectional view of a given object
9. To draw the development of the lateral surface of given object
10. To draw the isometric projection of the given orthographic projection.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-point scale which would include the drawing sheet by the students and a Viva taken by the faculty concerned. The marks shall be given on the drawing sheet & regard maintained by the faculty.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

Drawing Sheet (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Note: The drawing sheet could be manual or in Auto CAD.

Semester II

Workshop Practice (Lab)

Course Code: EME262/162

L T P C
0 0 4 2

List of Experiments:

(Perform any ten experiments selecting at least one from each shop.)

Carpentry Shop:

1. To prepare half-lap corner joint.
2. To prepare mortise & tenon joint.
3. To prepare a cylindrical pattern on woodworking lathe.

Fitting Bench Working Shop:

1. To prepare a V-joint fitting
2. To prepare a U-joint fitting
3. To prepare a internal thread in a plate with the help of tapping process

Black Smithy Shop:

1. To prepare a square rod from given circular rod
2. To prepare a square U- shape from given circular rod

Welding Shop:

1. To prepare a butt and Lap welded joints using arc welding machine.
2. To prepare a Lap welded joint Gas welding equipment.
3. To prepare a Lap welded joint using spot welding machine.

Sheet-metal Shop:

1. To make round duct of GI sheet using 'soldering' process.
2. To prepare a tray of GI by fabrication

Machine Shop:

1. To study the working of basic machine tools like Lathe m/c, Shaper m/c, Drilling m/c and Grinding m/c.
2. To perform the following operations on Centre Lathe:
Turning, Step turning, Taper turning, Facing, Grooving and Knurling
3. To perform the operations of drilling of making the holes on the given metallic work-piece (M.S.) by use of drilling machine.

Foundry Shop:

1. To prepare core as per given size.
2. To prepare a mould for given casting.

Evaluation Scheme of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 4-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 (35 MARKS)				ON THE DAY OF EXAM (15 MARKS)		TOTAL INTERNAL (50 MARKS)
EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 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.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)
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Semester II

DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP211

L T P C

0 0 0 0

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

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

The above is 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).

Head of Department would be display GP marks on notice board in prescribed format after IInd & IIIrd CT in semester:

S N o	Enroll No.	Student Name	Dress code	Participation in Conferences /Workshops / Seminars	Participation in guest lectures, invited talks and special technical sessions	Participation in community Services	Participation in Culture & extra curriculum activities, Department Club Activities	Participation in sports/ co- curricular activities	General Behavior	Any Extra Achievement
			(5)	(15)	(20)	(10)	(20)	(20)	(5)	(5)
Responsible for marks			Mentor	Head	Head	Mentor	Cultural Events Coordinator & Department Club Coordinator	Sports Coordinator	Mentor	Director or Principal

B.Tech (CSE) Semester III

DISCRETE STRUCTURE

Course Code: ECS301

L	T	P	C
3	1	0	4

Objective:

Discrete mathematics has become popular in recent past 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; Algebra, Conditional; Truth tables; Logical Equivalence and implications; Converse; Inverse; Contra-positive; Bi-conditional statements; Negation of Compound statements; Tautologies and Contradiction; Normal Forms; Arguments; Fallacies; Quantifiers, Mathematical Induction.

(Lecture 08)

Unit II

Boolean algebra: Algebra, Expressions, Functions, canonical forms (SOP, POS) **Circuits:** Logic Gates, Logic Circuits, Simplification of functions using K-Map.

(Lecture 08)

Unit III

Set Theory: Concepts, Operations, Identities, Venn diagram, Cartesian product. **Relation:** Definition, Types, Pictorial representation, Composition. **Function:** Definition, Classification, Types, Composition.

(Lecture 08)

Unit IV

Combinatorics: Principles, Permutation and Combination; Recurrence Relations Generating functions, Binomial Theorem.

(Lecture 08)

Unit V

Graphs: Terminology, Types, Properties, Applications, Isolated vertex, Pendent Vertex.

Trees: Terminology, Types, Properties, Applications, Traversal (Pre-order, Post-order, in-order).

(Lecture 08)

Course Outcome:

At the end of the course the students would:

1. Be capable of understanding the concept and applications of propositional and predicate calculus.
2. Have knowledge of the concepts needed to test the logic of a program.
3. Perform operations on discrete structures such as sets, relations and functions.
4. Be familiar with concepts like Permutations and Combinations, Recurrence Relations Generating functions, Binomial Theorem.
5. Be capable to understand how Graphs and Trees are used as tools and Mathematical Models in the study of networks.

Text Books

1. Rawool, V. and Raul, B., *Discrete Mathematics*, Tech Max.
2. Kumar, S.S., *Discrete Mathematics*, S. Chand.
3. Deo, N., *Graph Theory with Applications to Engineering and Comp. Sci.*, Prentice Hall of India.

Reference books

1. Lipchitz, S. & Lipson S., *Discrete Mathematics*, Outline series Tata McGraw Hill.
2. Liu, C.L., *Elements of Discrete Mathematics*, McGraw Hil.
3. Dean, N., *Essence of Discrete Mathematics*, Prentice Hall.
4. Rosen, Kenneth H., *Discrete Mathematics and Its Applications*, McGraw Hill.
5. Johnsonbaugh, R., *Discrete Mathematics*, Macmillan.

*Latest editions of all the suggested books are recommended,

B.Tech (CSE) Semester III
DATA STRUCTURE USING C

Course Code: ECS305

L	T	P	C
3	1	0	4

Objective:

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.

Unit I

Data Structure: Terminology, Operations, Elementary Data Organization, Algorithm Complexity and Time-Space trade-off.

Arrays: Definition, Representation and Analysis, Single and Multidimensional, address calculation, applications, Character String; String operation; Ordered List, Sparse Matrices.

Stacks: Array Representation and Implementation, Linked Representation, Operations; Push & Pop; Applications; Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression

(Lecture 08)

Unit II

Queues: Array Representation and Implementation, Linked Representation, Operations: Create, Add, Delete, Full and Empty, Types; Circular queue, Dequeue, Priority Queue;

Linked List: Representation and Implementation, Two-way Header List, Traversing and Searching, Overflow and Underflow, Operations; Insertion and deletion; doubly linked list, Garbage Collection and Compaction.

(Lecture 08)

Unit III

Trees: Terminology, Binary Trees; Array and Linked Representation, Types: Complete, Extended, Threaded; Algebraic Expressions: Operations, Huffman algorithm.

Searching and Hashing: Sequential, Binary, Comparison and Analysis, Hash Table and Functions.

(Lecture 08)

Unit IV

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

Binary Search Trees: Concepts, Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees.

(Lecture 08)

Unit V

Graphs: Terminology & Representations, Graphs vs. Multi-graphs, Directed, Representations, 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: Indices: Primary, Secondary; Index Files; B+ Tree index Files, B Tree index files; Indexing and Hashing Comparisons.

(Lecture 08)

Course Outcome:

After completing this course the students should be able to:

1. Identify fundamental data structures and algorithms and summarize their typical uses, strengths, and weaknesses.
2. Analyze the complexity of algorithms.
3. Students develop knowledge of basic data structures for storage and retrieval of ordered or unordered data.
4. Data structures include: arrays, linked lists, binary trees, heaps, and hash tables.

5. Solve problems computationally through the application of fundamental data structures and algorithms
6. Students develop knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, searching, and sorting of each data structure.
7. Students learn to analyze and compare algorithms for efficiency using Big-O notation.
8. Students implement projects requiring the implementation of the above data structures.

Text Books

1. Lipschutz, S., *Data Structure*, Tata McGraw Hill.
2. Tenenbaum, A.M., *Data Structures using C & C++*, Prentice Hall of India.
3. Kanitkar, Y., *Data Structure using C++*, BPB.

Reference Books

1. Sahani, S. and Horowitz, E., *Fundamentals of Data Structures*, Galgotia
2. Kruse, R., *Data Structures and Program Design in C*, Pearson Education.
3. Cormen, T. H., *Introduction to Algorithms*, Prentice Hall of India.
4. Loudon, K., *Mastering Algorithms With C*, Shroff Publisher & Distributors.

*Latest editions of all the suggested books are recommended,

B.Tech (CSE) Semester III
DATABASE MANAGEMENT SYSTEM

Course Code: ECS306

L	T	P	C
3	1	0	4

Objective:

To gain the knowledge of Data Modeling using the Entity Relationship Model, SQL, Normalization, Transaction Processing Concepts, and Concurrency Control Techniques.

Course

Content Unit I

Database: History, database system vs. file system; Concepts; Architecture; Data models; Schema; Instances; Data independence and Database Languages: Interfaces, DDL(Data Definition Language), DML(Data Manipulation Language); ER Model: Notations,Diagram, reduction of Diagrams to tables, Extended ER Mapping Constraints.Keys: Concepts, Types, Comparison, Operations.**Abstraction:** Generalization, Aggregation.

(Lecture 08)

Unit II

Relational data Model and Language: Concepts; Integrity: Entity, Referential; Constraints: Keys, Domain; Relational Algebra; Relational Calculus; Tuple and Domain Calculus.

Introduction to SQL: Characteristics, Advantage, Data Types and Literals, Commands, Operators and their Procedure, Tables, Views and Indexes, Queries and sub queries, Aggregate functions, Operations: Insert, Update, Delete, Join, Union, Intersection, Minus, Cursors.

(Lecture 08)

Unit III

Data Base Design: Functional Dependencies; Lossless Join Decompositions; Alternative approaches to Database Design.**Normalization:** Normal Forms using FD, MVD, and JDs.

(Lecture 08)

Unit IV

Transaction Processing Concepts: Transaction system, Serializability, Testing, Schedules: Conflict& View Serializable Schedule; Recoverability: Recovery from Transaction Failures; Log Based Recovery, Checkpoints, Deadlock Handling.

(Lecture 08)

Unit V

Concurrency Control Techniques: Locking Techniques, Time-Stamping Protocols, Validation based Protocol, Multiple Granularity, Multi Version Schemes, Recovery with Concurrent Transaction.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Master the basic concepts and appreciate the applications of database systems.
2. Master the basics of SQL and construct queries using SQL.
3. Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.
4. Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
5. Master sound design principles for logical design of databases, including the E-R method and normalization approach.
6. Be familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B-tree, and hashing.
7. Master the basics of query evaluation techniques and query optimization.
8. Be familiar with the basic issues of transaction processing and concurrency control.
9. (optional) Master working successfully on a team by design and development of a database application system as part of a team.

Text Books

1. Date, C. J., *An Introduction to Database System*, Addison-Wesley.
2. Korth, H.F.,Silbertz, A., *Database Concepts*, McGraw Hill.
3. Elmasri, R., Navathe, S., *Fundamentals of Database Systems*, Addison-Wesley.

Reference Books

1. Desai, B.C., *An introduction to Database Systems*,Galgotia.
2. Majumdar, A. K. and Bhattacharya, P., *Database Management System*, Tata McGraw Hill.
3. Ramakrishnan, R., Gehrke, J., *Database Management System*, McGraw Hill

*Latest editions of all the suggested books are recommended,

B.Tech (CSE) Semester III
DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION
Course Code: EEC302

L	T	P	C
3	1	0	4

Objective:

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

Unit I

Number System: 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.

(Lecture 08)

Unit II

Boolean algebra: Definition, Properties, Law's. **Digital Logic Circuits:** Logic Gates: AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR Gates; 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; ROM Working & Circuit.

(Lecture 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.

(Lecture 08)

Unit IV

Computer Registers and I/O: 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.

(Lecture 08)

Unit V

Computer Organization: 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.

(Lecture 08)

Course Outcome:

1. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
2. To understand and examine the structure of various number systems and its application in digital design.
3. The ability to understand, analyze and design various combinational and sequential circuits.
4. The ability to identify and prevent various hazards and timing problems in a digital design.
5. To develop skill to build, and troubleshoot digital circuits.
6. Understand the operation of electronic logic elements

7. Understand the organization of a computer system in terms of its main components
8. Understand the detailed operation of a simple microprocessor
9. Understand different processor architectures
10. Understand input/output mechanisms
11. Understand the various parts of a system memory hierarchy
12. Have practical experience of prototyping digital circuits
13. Be able to interface digital circuits to microprocessor systems

Text Book

1. Mano, M., *Computer System Architecture*, Prentice Hall of India.
2. Mano, M., *Digital Logic*, Prentice Hall of India.
3. Stallings, W., *Computer Organization*, Prentice Hall of India.

Reference Books

1. Tannenbaum, O., *Structured Computer Organization*, Prentice Hall of India.
2. Hayes, P.J., *Computer Organization*, McGraw Hill.

*Latest editions of all the suggested books are recommended.

**B.Tech (CSE) Semester III
MATHEMATICS-III**

Course Code: EAS301

**L T P C
3 1 0 4**

Unit I

Integral Transforms: Fourier integral, Fourier complex transform, Fourier sine and cosine transforms and applications to simple heat transfer equations. Z – Transform and its application to solve difference equations.

(Lecture 08)

Unit II

Functions of a Complex Variable: Analytic functions; C-R equations and harmonic functions; Line integral in the complex plane; Cauchy's integral theorem, Cauchy's integral formula for derivatives of analytic functions; Liouville's theorem.

(Lecture 08)

Unit III

Functions of a Complex Variable II: Representation of a function by power series; Taylor's and Laurent's series; Singularities, zeroes and poles; Residue theorem, evaluation of real integrals; conformal mapping and bilinear transformations.

(Lecture 08)

Unit IV

Statistical Techniques: Moments, Moment generating functions, Skewness, Kurtosis, Curve Fitting and Solution of Equations: Method of least squares and curve fitting of straight line and parabola, Solution of cubic and bi-quadratic equations, Correlation and Regression, Binomial distribution, Poisson distribution, Normal distribution.

(Lecture 08)

Unit V

Numerical Technique: Bisection method, Regula – Falsi method, Newton - Raphson method. **Interpolation:** Finite difference, Newton's forward and backward interpolation, Lagrange's and Newton's divided difference formula for unequal intervals; Numerical Differentiation, Numerical Integration; Trapezoidal, Simpson's 1/3 and 3/8 rule.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Fourier Integral and Fourier Transformation.
2. Analyticity of function of complex variables
3. Residues, complex integration as Cauchy's theorem on integration
4. Statistical techniques as correlation and regression
5. Numerical differentiation and integration as Trapezoidal, Simpson's 1/3 and 3/8 rule

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 Mathematics Vol-II*, S. Chand.

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-III*, Laxmi Publications.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester III ORGANIZATIONAL BEHAVIOR

Course Code: EHM302

L	T	P	C
3	0	0	3

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 Behavior, Management Challenge, Organizational Goal. Global challenges and Impact of culture.

(Lecture 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.

(Lecture 08)

Unit III

Motivation: Concepts and Their Application, Principles, Theories, Motivating a Diverse Workforce.

Leadership: Concept, Function, Style and Theories of Leadership-Trait, Behavioral and Situational Theories. Analysis of Interpersonal Relationship, Group Dynamics: Definition, Stages of Group Development, Formal and Informal Groups, Group Decision Making.

(Lecture 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.

(Lecture 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.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Concept and importance of organizational behavior, challenges for management
2. Perception and Thinking process of individual, personality traits and its importance to organization
3. Theories of motivation and leadership and its importance, applicability into business
4. Flow and formation of powers and politics in organizational groups
5. Culture and Conflicts- Group difference and its outcomes, Stress Management

Text Books:

1. W Newstrom John, *Organizational Behavior: Human Behavior at Work*, Tata McGraw Hill
2. Fred, Luthans, *Organizational Behaviour*, Tata McGraw Hill

3. Shane L Mc. Steven, Glinow Mary Ann Von & Sharma Radha R., “*Organizational Behavior*”
Tata McGraw Hill

Reference Books

1. Robbins Stephen P., *Organizational Behavior* Pearson Education
2. Hersey Paul, “*Management of Organizational Behavior: Leading Human Resources*”
Blanchard, Kenneth H and Johnson Dewey E., Pearson Education

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester III
DATA STRUCTURE USING C (LAB)

Course Code: ECS355

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

1. To write programs implementing Sorting programs: Bubble sort, Merge sort, Insertion sort, Selection sort, and Quick sort.
2. To write programs implementing Searching programs: Linear Search, Binary Search.
3. To write programs Array implementation of Stack, Queue, Circular Queue, Linked List.
4. To write programs implementing Stack, Queue, Circular Queue, Linked List using dynamic memory allocation.
5. To write program implementing Binary tree.
6. To write programs implementing Tree Traversals (pre-order, in-order, post-order).
7. To write programs implementing graph traversal (BFS, DFS).
8. To write programs implementing minimum cost spanning tree, shortest path.

Course Outcome:

After completion of the course the students shall be able to understand:

1. Implementation of sorting techniques.
2. Implementation of searching techniques.
3. All the operations on Stack, Queue, Linked List.
4. Data representation and operations using tree and graph.
5. Concept of recursion and its types with examples

B.Tech (CSE) Semester III
DATA BASE MANAGEMENT SYSTEM (LAB)

Course Code: ECS356

L	T	P	C
0	0	3	1.5

LIST OF EXPERIMENTS

1. To write a program to Create Table, SQL for Insertion, Deletion, Update and Retrieval using aggregating functions.
2. To write a program in PL/SQL, Understanding the concept of Cursors.
3. To write a program for implementing Join, Union & intersection etc.
4. To write a program for Creating Views, Writing Assertions Triggers.
5. To write a program for Creating Forms, Reports etc.
6. To write codes for generating read and update operator in a transaction using different situations.
7. To write a program to Implement 2PL concerning central algorithm.
8. To develop 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.

Course Outcome:

After completion of the course the students shall be able to understand:

1. Creation of Table structure along with the integrity rules.
2. All DML, DDL commands.
3. Implementation of various joins operations.
4. Basic programming knowledge of PL/SQL Code.

B.Tech (CSE) Semester III
DIGITAL LOGIC CIRCUIT (LAB)

Course Code: EEC351

L	T	P	C
0	0	3	1.5

LIST OF EXPERIMENTS

- 1) To study of following combinational circuits: Multiplexer, Demultiplexer and Encoder. Verify truth tables of various logic functions.
- 2) To 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 bi-stable multi-vibrator 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 astable 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.

Course Outcome:

After completion of the course the students shall be able to understand:

1. Creation of different combinational circuits with its truth table.
2. Design of various registers and transistor.
3. Implementation of CMOS integrated circuit and conversion.
4. BCD to binary conversion

Semester-III

English Communication and Soft Skills-III

Course Code: EHM349/449/BHM349

L T P C

1 1 2 2

Objectives:

1. To enable the learners to upgrade their knowledge of grammar and vocabulary to address competitive exams like GATE/PGT/TGT.
2. To enable the learner to improve their listening.
3. To enable the learners to improvise their voice modulation in reading and speaking.
4. To enable the learners to enhance their writing and comprehensive skills in English
5. To enable the learners to proactively participate in activities in situational context.

Course Outcomes: At the end of the semester, the learners will be able to

1. Refine their usage of English grammar in day to day context.
2. Acquire adequate knowledge of grammar to address competitive exams like GATE/PGT/TGT.
3. Use advance English language by using variety of words i.e. idioms and phrase in variety of sentences in functional context.
4. Improve their listening to understand the basic content.
5. Improvise their voice modulation while reading and speaking something.
6. Enhance writing and comprehensive skills in English.
7. Present simple power point presentation (PPT).
8. Proactively participate in activities in situational context (like impromptu).

Course Contents:

Unit – I Grammar & Vocabulary

(14 hours)

- Correction of Common Errors (with recap of English Grammar with its usage in practical context.)
- Synthesis of sentences: Simple, complex and compound Sentences
- Transformation of sentences
- Commonly used Idiom & Phrases (Progressive learning whole semester)

Unit – II Essence of Effective listening & speaking

(12 hours)

- Listening short conversation/ recording (TED talks / Speeches by eminent personalities)
Critical Review of these abovementioned
- Voice Modulation: Five P's - Pace, Power, Pronunciation, Pause, and Pitch.
- Impromptu
- Power Point Presentation (PPT) Skills: Nuances of presenting PPTs

Unit – III Reading and Comprehension Skills**(08 hours)**

- Strategies of Reading comprehension: Four S's
- How to solve a Comprehension (Short unseen passage: 150-200 words)
- Reading Newspaper (Progressive learning whole semester)

Unit – IV Writing Skills**(06 hours)**

- Essentials of a paragraph
- Paragraph writing (100-120 words)

Reference Books:

1. Allen, W. "*Living English Structure*" Pearson Education, New Delhi.
2. Joseph, Dr C.J. & Myall E.G. "*A Comprehensive Grammar of Current English*" Inter University Press, Delhi
3. Wren & Martin "*High School English Grammar and Composition*" S.Chand & Co.Ltd., New Delhi.
4. Norman Lewis "*Word Power Made Easy*" Goyal Publications & Distributers, New Delhi.
5. Chaudhary, Sarla "Basic Concept of Professional Communication" Dhanpat Rai Publication, New Delhi.
6. Kumar Sanjay & Pushplata "*Communication Skills*" Oxford University Press, New Delhi.
7. Agrawal, Malti "*Professional Communication*" Krishana Prakashan Media (P) Ltd. Meerut.

Note:

- For effective communication practice, groups will be changed weekly
- Class (above 30 students) will be divided in to two groups for effective teaching.

Evaluation Scheme

Internal Evaluation		External Evaluation		Total Marks
40 Marks		60 Marks		100
30 Marks (Progressive Evaluation) After each unit-completion: Assignments / oral Presentation	10 Marks (Attendance)	20 Marks Midway external assessment (Oral Presentation) *	40 Marks (Written Examination)	

*** Parameters of Midway external assessment Oral Presentation**

Content	Pronunciation	Delivery of Content	Question responsiveness	TOTAL
05 Marks	05 Marks	05 Marks	05 Marks	20 Marks

Note:

***Midway Assessment:** To take corrective actions, midway assessment will be conducted by 2-member committee of Director's nominee (not by the faculty teaching English courses) and average of the two would be the 20 marks obtained by the students after two units are completed. The marks in sealed envelope will be sent to Examination Department.*

***Written Examination:** There would be four questions with internal choice one from each unit of 10 marks.*

Semester III
DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP311

L T P C

1 0 0 1

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

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

The above is 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).

Head of Department would be display GP marks on notice board in prescribed format after IIInd & IIIrd CT in semester:

S N o	Enroll No.	Student Name	Dress code	Participation in Conferences /Workshops / Seminars	Participation in guest lectures, invited talks and special technical sessions	Participation in community Services	Participation in Culture & extra curriculum activities, Department Club Activities	Participation in sports/ co- curricular activities	General Behavior	Any Extra Achievement
			(5)	(15)	(20)	(10)	(20)	(20)	(5)	(5)
Responsible for marks			Mentor	Head	Head	Mentor	Cultural Events Coordinator & Department Club Coordinator	Sports Coordinator	Mentor	Director or Principal

B.Tech (CSE) Semester IV

THEORY OF COMPUTATION

Course Code: ECS401

L	T	P	C
3	1	0	4

Objective:

To gain knowledge of Computer Automation and Computation.

Course Contents

Unit-I

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, Definitions, Finite automaton model, acceptance of strings and languages, Deterministic finite automaton and non deterministic finite automaton, Transition diagrams and language recognizers, Chomsky hierarchy of languages. **(Lecture 08)**

Unit-II

Finite Automata: NFA with ϵ transitions-Significance, Acceptance of languages. Conversions and Equivalence, Equivalence between NFA with and without null transitions, NFA to DFA conversion, Minimization of FSM, Equivalence between two FSM's, Finite Automata with output-Moore and Mealy machines. **(Lecture 08)**

Unit-III

Regular Languages: Regular sets, Regular expressions, Identify rules, Constructing finite Automata for a given regular expressions, Conversion of finite automata to regular expressions, Pumping lemma of regular sets.

Grammar Formalism: Regular grammars-right linear and left linear grammars, Equivalence between regular linear grammar and FA, Context free grammar, Derivation trees, Sentential forms, Rightmost and leftmost derivation of strings. **(Lecture 08)**

Unit-IV

Context Free Grammars: Ambiguity in context free grammars. Minimization of context free grammars, Chomsky normal form, Greiback normal form, Pumping lemma for context free languages. **(Lecture 08)**

Unit-V

Push Down Automata: Push down automata, Definition, Model, Acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, Introduction to Turing Machine, TM Definition, TM Model, Design of TM. **(Lecture 08)**

Course Outcome:

After completion of the course the students shall be able to understand:

1. Basics of Computational theory.
2. Difference between different Machines along with their conversions and minimization of finite automata.
3. Grammar formulism and regular expression used in machines.
4. About different grammars and their conversion from one to another.
5. To study, explore and design the PDA and Turing Machines.

Text Books:

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

Reference Books:

1. Martin J. C., “Introduction to Languages and Theory of Computations”, TMH
2. Papadimitrou, C. and Lewis, C.L., “Elements of theory of Computations”, PHI
3. Cohen D. I. A., “Introduction to Computer theory”, John Wiley & Sons
4. Kumar Rajendra, “Theory of Automata (Languages and Computation)”, PPM

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester IV
OBJECT ORIENTED PROGRAMMING SYSTEM

Course Code: ECS403

L	T	P	C
3	1	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 include features such as information hiding, data abstraction, encapsulation, modularity, polymorphism, and inheritance.

Course Contents

Unit I

OOP: History, OOP vs. Procedure oriented programming, Abstraction, Encapsulation, Inheritance and Polymorphism. **Object & Classes:** Links and Associations, Generalization, Aggregation, Abstract classes, Metadata. **C++ Basics:** Structure of a 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

(Lecture 08)

Unit II

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. **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.

(Lecture 08)

Unit III

C++ Classes and Data Abstraction: Definition, Structure, Objects, Scope, this pointer, Friends to a class, Static class members, Constant member functions, Constructors and Destructors, Data abstraction. **Polymorphism:** Function overloading; Operator overloading; Generic programming: necessity of templates, Function templates and class templates. **Inheritance:** Class hierarchy, Types, Base and Derived classes, Access to the base class members, Destructors, Virtual base class.

(Lecture 08)

Unit IV

Virtual Functions and Polymorphism: Static and Dynamic bindings; Base and Derived class Virtual function: Definition, Call mechanism, pure virtual functions; Virtual destructors; Abstract classes; Implications of polymorphic use of classes.

(Lecture 08)

Unit V

C++ I/O: I/O using C functions; Stream classes hierarchy; Stream I/O; File streams and String streams; Overloading << and >> operators; Error handling during file operations; Formatted I/O.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Describes the functionality of design applications of C++.
2. Describes the basic structure of C++ program and the process of object oriented modeling.
3. Concept includes C++ Classes and Data Abstraction with full use of inheritance

4. Concept of polymorphism and the main functionality of virtual.
5. Concept of file management and its various operations

Text Books

1. Rambaugh, J, *Object Oriented Design and Modeling*, Prentice Hall of India.
2. Lafore.R, *Object Oriented Programming in C+*, Galgotia.
3. Balagurusamy, E., *Object Oriented Programming with C++*, Tata McGraw Hill.

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.

**B.Tech (CSE) Semester IV
SOFTWARE ENGINEERING**

Course Code: ECS404

L	T	P	C
3	1	0	4

Objective:

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.

Course Contents

Unit I

Introduction: Evolution and impact of Software Engineering, Software Development Life Cycle (SDLC) Models: Waterfall Model, Prototype Model, Spiral Model, agility and Agile Process model, Extreme programming, other process models of agile development and Tools, Layered Approach. **Software Requirements Analysis and Specifications** Feasibility Study, Functional and Non-Functional Requirements, Requirements Gathering, Requirement Analysis and Specifications using DFD, Data Dictionaries and ER Diagrams, Requirements documentation, Characteristics and Organization of Software Requirement Specifications (SRS)

(Lecture 08)

Unit II

Software-Design and Coding: Principles; Problem Partitioning; Abstraction; Top-Down and Bottom-Up design; Structured Approach; Functional vs. Object Oriented Approach; UML, Design Specifications and Verification; Cohesion; Coupling. Distributed Software Design, User Interface Design, Coding standards and Code Review Techniques

(Lecture 08)

Unit III

Software Testing :Software Testing Fundamentals, SDLC Testing : Unit Testing, Integration Testing, System Testing, Regression Testing, Smoke Testing, Security Test, Stress Test, Performance Test, Functional Testing or Black Box Testing: Boundary Value Analysis, Alpha Testing, Beta Testing, and Acceptance Testing, Structural Testing or White Box Testing: Basis Path Testing, DD-Paths, Cyclomatic Complexity, Data Flow Testing, Mutation.

(Lecture 08)

Unit IV

Test Management: Test Cycle, Test Estimation, Test Cases, Test Scenarios **Testing Tools:** Static, Dynamic, Characteristics of Modern Tools and Automation.

(Lecture 08)

Unit V

Software Maintenance: Updates-Upgrades-Patches-Versions, Error Reporting, Customer Support, Maintenance Process, **Software Reliability:** Importance, Hardware Reliability and Software Reliability, Failure and Faults, Reliability Models, Software Reuse, **CASE (Computer Aided Software Engineering):** Scope; Architecture; CASE Support in SDLC; Documentation; Reverse Software Engineering.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. How to manage a project including planning, scheduling and risk assessment/management.
2. How to author the software requirements document.
3. How to identify specific components of a software design that can be targeted for reuse.
4. Software development cost estimation.
5. How to author a software testing plan.

Text Books

1. Agarwal, K.K., *Software Engineering*, New Age International.
2. Pressman, R.S., *Software Engineering: A Practitioner's Approach*, McGraw Hill.
3. Jalote, P., *Software Engineering*, Narosa Publishing House.
4. Perry, W., *Effective Methods for Software Testing*, John Wiley & Sons.
5. Tamres, L., *Software Testing*, Pearson Education.
6. Robert, V. B., *Testing Object-Oriented Systems-Models, Patterns and Tools*, Addison-Wesley.

Reference Books

1. Sommerville, I., *Software Engineering*, Addison-Wesley.
2. Aggarwal, K.K. & Singh, Y., *Software Engineering*, New Age International Publishers.
3. Boris, B., *Software Testing Techniques*, Van Nostrand Reinhold.
4. Boris, B., *Black-Box Testing – Techniques for Functional Testing of Software and Systems*, John Wiley & Sons.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester IV
COMPUTER BASED NUMERICAL & STATISTICAL TECHNIQUES

Course Code: ECS405

L	T	P	C
3	1	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

Linear Equations: Direct Method; Gauss Jordan and Gauss Elimination Methods; Pivoting; Iterative methods; Jacobi and Gauss Seidel methods;

(Lecture 08)

Unit II

Non-Linear 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.

(Lecture 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.

(Lecture 08)

Unit IV

Representation and Analysis: Curve Fitting; Cubic Spline and Approximation: Method of Least Squares, Fitting of Straight Lines, Polynomials and Exponential Curves. **Frequency Chart:** Histogram, Frequency Curve, Pi-chart. **Regression analysis:** Linear and Non-linear, Multiple Regression.

(Lecture 08)

Unit V

Time Series and Forecasting: Moving Averages; Smoothing 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.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Solve large systems of simultaneous linear equations.
2. Find solutions of non-linear equations using bisection method, Newton's methods and False Position method and implement using a computer. Also solve integration with the help of Trapezoidal rule and Simpson's rules.
3. Solve Finite differences with the help of some operators like Shift operator and also find data after analysis of given data using various numerical methods like Newton's method, Lagrange's method etc and implement using a computer.

4. Employ appropriate regression models to determine statistical relationships.
5. Apply basic statistical inference techniques, including confidence intervals, hypothesis testing and analysis of variance, to science/engineering problems.

Text Books:

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

Reference Books:

1. Veerarajan, T. Ramachandran, T., *Theory and Problems in Numerical Method*, Tata McGraw Hill.
2. Niyogi, P., *Numerical Analysis and Algorithms*, Tata McGraw Hill.
3. Scheld, F., *Numerical Analysis*, Tata McGraw Hill.
4. Balaguruswamy, E., *Numerical methods*, Tata McGraw Hill.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester IV

OPERATING SYSTEM

Course Code-ECS406

L	T	P	C
3	1	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

Operating System: History, Types: Batch System, Time Sharing System, Real Time System, Multiprogramming, Distributed System; Functions; Services; System calls; System programs; Virtual machines.

(Lecture 08)

Unit II

Process Management: Concept, States, Control Block, Scheduling; CPU, Criteria, Algorithms, Preemptive & Non Preemptive.

(Lecture 08)

Unit III

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

Deadlocks: Characterization, Avoidance, Detection & Recovery.

(Lecture 08)

Unit IV

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

Virtual Memory: Concept, Demand Paging, Page Replacement Algorithms, Allocation of Frames, Thrashing.

(Lecture 08)

Unit V

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

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Describes the functionality of operating system.
2. Describes process, its management and synchronization.
3. Concept of deadlock, how it is detected and prevented
4. Concept of memory and its management and various processes to manage it.
5. Concept of file management and its various techniques

Text Books

1. Silberschatz, A. and Galvin, P., *Operating System Concept*, Addison-Wesley.
2. Nutt, G., *Operating Systems*, Addison-Wesley.

3. God bole, A., *Operating System*, Prentice Hall of India.

Reference Books

1. Flynn, M., *Understanding Operating System*, Thomson Press.
2. Tannenbaum, O., *Operating System Concept*, Addison-Wesley.
3. Joshi, R.C., and Tapaswi, S., *Operating Systems*, Wiley-Dreamtech.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester IV
HUMAN VALUES & PROFESSIONAL ETHICS

Course Code: EAS403

L	T	P	C
3	1	0	4

Objective: Science, Technology and Engineering as knowledge and as Social and Professional Activities.

Course Contents

Unit I

Effects of Technological Growth: Rapid Technological growth and depletion of resources, Reports of the Club of Rome. Limits of growth: sustainable development Energy Crisis: Renewable Energy Resources Environmental degradation and pollution. Eco-friendly Technologies. Environmental Regulations, Environmental (Lecture 08)

Unit II

Ethics Appropriate Technology Movement of Schumacher; later developments Technology and developing notions. Problems of Technology transfer, Technology assessment impact analysis. Human Operator in Engineering projects and industries. Problems of man, machine, interaction, Impact of assembly line and automation. Human centered Technology. (Lecture 08)

Unit III

Ethics of Profession: Engineering profession: Ethical issues in Engineering practice, Conflicts between business demands and professional ideals. Social and ethical responsibilities of technologists. codes of professional ethics. Whistle blowing and beyond, Case studies. (Lecture 10)

Unit IV

Profession and Human Values: Values Crisis in contemporary society Nature of values: Value Spectrum Of good life Psychological values: Integrated personality; mental health Societal values: The modern search for a good society, justice, democracy, secularism, rule of law, values in Indian Constitution. (Lecture 08)

Unit V

Aesthetic values: Perception and enjoyment of beauty, simplicity, clarity Moral and ethical values: Nature of moral judgments; canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility. (Lecture 08)

08)Course Outcome:

After completion of the course the students shall be able to understand:

1. Importance of Resources , Renewable Energy, Technology, Sustainable Development
2. Ethics in developing and using Technologies
3. Ethics for business and profession, organizational groups
4. Inculcation the importance of human values, moralities in profession and crisis management
5. Understanding the corporate responsibilities in regard of society

Text Books:

1. Stephen H Unger, Controlling Technology: Ethics and the Responsible Engineers, John Wiley & Sons, New York 1994 (2nd Ed) 2. Deborah Johnson, Ethical Issues in Engineering, Prentice Hall, Englewood Cliffs, New Jersey 1991. 3. A N Tripathi, Human values in the Engineering Profession, Monograph published by IIM, Calcutta 1996.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester IV
C++ PROGRAMMING (LAB)

Course Code: ECS452

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

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

Course Outcome:

After completion of the course the students shall be able to understand:

1. Basic understanding of object oriented programming features.
2. Concept of inheritance and polymorphism.
3. Concept of virtual function, base class and containership.
4. Concept of operator overloading.
5. Searching and sorting methods and implementation.

B.Tech (CSE) Semester IV
COMPUTER BASED NUMERICAL & STATISTICAL TECHNIQUES
(LAB)

Course Code: ECS453

L	T	P	C
0	0	3	1.5

LIST OF EXPERIMENTS

1. To write a program implementing floating point arithmetic operations i.e., addition, subtraction, multiplication and division.
2. To write a program to deduce errors involved in polynomial interpolation.
3. To write programs implementing Algebraic and transcendental 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 write a program implementing formulae by Bessel's, Newton, Sterling, and Lagrange's.
5. To write a program implementing method of least square curve fitting.
6. To write a program implementing numerical differentiation.
7. To write a program implementing numerical integration using Simpson's 1/3 and 3/8 rules, trapezoidal rule.
8. To write a program showing frequency chart, regression analysis, Linear square fit, and polynomial fit.

Course Outcome:

After completion of the course the students shall be able to understand:

1. Implementing floating point arithmetic operations and deduce errors involved in polynomial interpolation.
2. Implementing Algebraic and transcendental equation.
3. Implementing formulae by Bessel's, Newton, Sterling, and Lagrange's.
4. Implementing method of least square and showing frequency chart, regression analysis etc.
5. Implementing numerical integration and differentiations

B.Tech (CSE) Semester IV
UNIX & SHELL PROGRAMMING (LAB)

Course Code: ECS454

L	T	P	C
0	0	3	1.5

LIST OF EXPERIMENTS

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

Course Outcome:

After completion of the course the students shall be able to understand:

1. UNIX components and its environment.
2. The usage of basic UNIX commands.
3. Implement the backup, recovery and user authorization with use of commands.
4. Source code control system and how to use debugging tools.
5. Design the script based programs using shell & awk script.
6. Design programs using C programming Language related with inter process communication, socket etc.

Semester IV

English Communication and Soft Skills-IV

Course Code: EHM499

L T P C
0 0 4 2

Objective: To enable students enhance their four quadrant of communication- Listening, Speaking, Reading and Writing.

List of Practical: Hours)

(Total: 40

- | | |
|---|------------|
| 1.Practice on syllable, word stress and intonation. | (02 hours) |
| 2.Practice on vocabulary building: word games. | (02 hours) |
| 3.Practice of self introduction and introducing others. | (04 hours) |
| 4.Practice on sentence structures using technical terms. | (02 hours) |
| 5.Practice on comprehension: reading news paper and short stories. | (04 hours) |
| 6.JAM session (just a minute session) on various topics. | (02 hours) |
| 7.Welcome speech, introductory speech, vote of thanks & farewell speech | (04 hours) |
| 8.Debate on current issues. | (04 hours) |
| 9.Role play in diverse situations to build confidence. | (04 hours) |
| 10. Extempore speech on various topics. | (04 hours) |
| 11. Group discussion on current topics. | (04 hours) |
| 12. Mock interview | (04 hours) |

Reference Books:

1. Balasubramanian T., *A Textbook of English Phonetics for Indian Students*, Macmillan India Ltd., Madras. 1995.
2. Sethi J & Dhamija P.V., *A Course in Phonetics and Spoken English*, Prentice Hall of India, New Delhi. 1989.
3. Allen, W.S., *Living. English Speech*, London. Longman, 1965
4. Taylor Grant, *English Conversation Practice*, Tata McGraw Hill New Delhi.
5. Mohan Krishna and Banerji Meera, *Developing Communication Skills*, MacMillan India Ltd., Delhi
6. Jones, D., *English Pronouncing Dictionary*, University Bookstall, New Delhi. 2008.
7. Pandey L.U.B & Singh R. P., *A Manual of Practical Communication*, A.I.T. B.S. Publication India Ltd. Krishna Nagar, Delhi.
8. Pandey L.U.B & Singh R. P., *A Manual of Practical Communication*, A.I.T. B.S. Publication India Ltd. Krishna Nagar, Delhi.
9. Gupta Rajhans, *Communication: Practical Manual*, Pragati prakashan, Meerut, 2006.
10. Hornby A.S., *Oxford Advanced Learners Dictionary of Current English*, 7th Edition.

Learning Outcome:

1. Students will be able to pronounce English words properly.
2. They will be able to use words properly in sentences.
3. They will be able to overcome stage fright, nervousness and indecisiveness.
4. They will be able to speak in English on current issues.
5. They will be able to comprehend and interpret various facets of life and nature.

6. They will be able to make various kinds of speech.
7. They will be able to deliver dialogues in different situations.
8. They will be able to participate in group discussion.
9. They will be able to face interview.

Evaluation Scheme

Evaluation: 100 Marks

<i>Internal Evaluation</i>		<i>External Evaluation</i>		<i>Total</i>
50		50		100
<i>Progressive Evaluation: Lab Activities / Assignment / Oral Presentation</i>	<i>Attendance</i>	Midway External Assessment(Viva)*	External (Viva)**	
40	10	25	25	

Note: Midway external assessment of 25 marks will be submitted and considered with external evaluation with a total of 50 marks.

***Parameters of Midway External Assessment (Viva): 25 Marks**

<i>Content</i>	<i>Language</i>	<i>Oral Presentation</i>	<i>Body Language</i>	<i>Question Responsiveness</i>	<i>Total</i>
5	5	5	5	5	25

Note: To take corrective actions, midway assessment will be conducted by 2-member committee of Director's nominee (not by the faculty teaching English courses) and average of the two would be the 25 marks obtained by the students after 50% syllabus is completed.

****Parameters of External Viva**

<i>Content</i>	<i>Language</i>	<i>Oral Presentation</i>	<i>Body Language</i>	<i>Question Responsiveness</i>	<i>Total</i>
5	5	5	5	5	25

Note: External Viva will be conducted by 3-member committee comprising

- a) Faculty teaching the class
- b) English faculty from other college of the University (As approved by VC).
- c) T&P officer of other colleges of the University (As approved by VC).

Each member will evaluate on a scale of 25 marks and the average of three would be the 25 marks obtained by the students.

Semester IV
DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP411

L T PC
1 0 0 1

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

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

The above is 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).

Head of Department would be display GP marks on notice board in prescribed format after IInd & IIIrd CT in semester:

S N o	Enroll No.	Student Name	Dress code	Participation in Conferences /Workshops / Seminars	Participation in guest lectures, invited talks and special technical sessions	Participation in community Services	Participation in Culture & extra curriculum activities, Department Club Activities	Participation in sports/ co- curricular activities	General Behavior	Any Extra Achievement
			(5)	(15)	(20)	(10)	(20)	(20)	(5)	(5)
Responsible for marks			Mentor	Head	Head	Mentor	Cultural Events Coordinator & Department Club Coordinator	Sports Coordinator	Mentor	Director or Principal

B.Tech (CSE) Semester V
COMPILER DESIGN AND CONSTRUCTION

Course Code: ECS501

L	T	P	C
3	1	0	4

Objective:

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

Course Contents

Unit 1

Compiler Structure: Compilers and Translators, Phases, Pass Structure, Bootstrapping. **Programming Languages:** High level languages, Lexical and syntactic structure, Data elements, Data Structure, Operations, Assignments, Program unit, Data Environments, Parameter Transmission.

Lexical Analysis: Lexical Analyzer, Role, Design Approach, Implementation, LEX Capabilities. **Regular Expressions:** Transition Diagrams, Finite state Machines. **Syntactic Specifications of Programming Languages:** CFG, Derivation, Parse tree, Ambiguity, Capabilities.

(Lecture 08)

Unit II

Parsing Techniques: Bottom-Up, Shift-Reduce, Operator Precedence, Top-Down with backtracking, Recursive Descent, Predictive, LR (SLR, Canonical LR, LALR), Syntax Analyzer Generator, YACC.

(Lecture 08)

Unit III

Intermediate Code Generation: 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.

(Lecture 08)

Unit IV

Run Time Memory Management: Static and Dynamic storage allocation, Stack based memory allocation schemes, Symbol Table management. **Error:** Semantic, Detection and Recovery for Lexical Phase, Syntactic phase.

(Lecture 08)

Unit V

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

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Understand the structure of compiler
2. Understand the basic techniques used in compiler construction such as lexical analysis, top-down, bottom-up parsing, intermediate code generation
3. Ability to design parsing tables from grammars

4. -Understand the basic data structures used in compiler construction such as abstract syntax trees, symbol tables, three-address code
5. Develop syntax directed translation scheme

Text Books

1. Alfred, V.A., Ullman, J.D., *Principles of Compiler Design*, Narosa Publishing House.
2. Aho, A.V., Sethi, R. and Ullman, J.D, *Compiler: Principle, Techniques and Tools*, Addison-Wesley.

Reference Books

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

*Latest editions of all the suggested books are recommended.

COMPUTER ARCHITECTURE

Course Code: ECS502

L	T	P	C
3	1	0	4

Objective:

To gain the knowledge of the topics of computer architecture like parallel computing, processor designing principles and multiprocessor scheduling strategies etc.

Course Contents

Unit I

Parallel Computing: Concepts, Architecture, Classification Schemes, Applications, Parallelism in Uni-processor Systems, Parallel Computer structures.

Pipelining Processing: An overlapped Parallelism, Instructions and Arithmetic.

(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, ShuffleExchange and Omega Network, SIMD matrix multiplication.

Multiprocessor Architecture: Tightly and loosely coupled multiprocessors.

(Lectures 08)

Unit IV

Multiprocessor Scheduling: Strategies and Deterministic Scheduling Models, Data Flow computing and Data Flow Graph, 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)

Course Outcome:

After completion of the course the students shall be able to understand:

1. How computer hardware has evolved to meet the needs of multiprocessing systems.
2. Understand the major components of a computer including CPU, memory, I/O and storage.
3. Basic understanding of assembly programming.
4. Understand design principles in instruction set design.
5. Understand parallelism both in terms of a single processor and multiple processors.

Text Books

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

Reference Books

1. Tabak, D., *Advanced Microprocessor*, McGraw Hill.
2. Hall, D.V, *Microprocessor and Interfacing, Program and hardware*, Tata McGraw Hill.
3. kar, R.S., *Microprocessor architecture, programming and application with the 8085*,

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester V
ANALYSIS AND DESIGN OF ALGORITHM

Course Code: ECS503

L	T	P	C
3	1	0	4

Objective:

To gain the technical knowledge about designing of algorithms and their analysis.

Course Contents

Unit I

Algorithms: Design paradigms, Motivation, Concept of algorithmic efficiency, Run Time Analysis Asymptotic Notations, Divide and conquer, Structure of divide-and-conquer algorithms, Binary search, Quick sort, Analysis of divide and conquer.

(Lecture 08)

Unit II

Greedy Method: Paradigms; Exact optimization solution (minimum cost spanning tree), approximate solution (Knapsack problem), Single source shortest paths.

(Lecture 08)

Unit III

Dynamic Programming: Concepts, Dynamic programming vs. divide and conquer, Applications, Shortest path in graph, Matrix multiplication, Traveling salesman Problem (TSP), Longest Common sequence(LCS).

(Lecture 08)

Unit IV

Graph searching and Traversal: Methods (Depth First search (DFS) and Breadth First Search (BFS)),back tracking, 8-Queen problem, Knapsack problem.

(Lecture 08)

Unit V

Brach and Bound: LC searching Bounding, FIFO branch and bound, LC, Applications, 0/1Knapsack problem, Traveling Salesman Problem.

Computational Complexity: Complexity Measures, Polynomial vs. Non-polynomial Time complexity, NP-hard and NP-complete classes, Examples.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Correctness of algorithms using inductive proof.
2. Analyze best, worst and average -case running times of algorithms using asymptotic analysis.
3. Describe the divide-and-conquer paradigm and explain when an algorithmic design.
4. Recite algorithms that employ this paradigm.
5. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
6. Describe the dynamic-programming paradigm
7. Describe the greedy paradigm and explain when an algorithmic design situation calls for it.
8. Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems,
9. Explain what competitive analysis is and to which situations it applies. Perform competitive analysis.
10. Compare between different data structures. Pick an appropriate data structure for a design situation.

Text Books

1. Cormen, L., *Introduction to Algorithms*, Prentice Hall of India.
2. Sahani, S., *Fundamentals of Computer Algorithms*, Galgotia.

Reference Books

1. Bratley, B., *Fundamental of Algorithms*, Prentice Hall of India.
2. Goodrich, M.T., *Algorithms Design*, John Wiley.
3. Aho, A.V., *The Design and analysis of Algorithms*, Pearson Education.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester V

JAVA PROGRAMMING

Course Code: ECS508

L	T	P	C
3	1	0	4

Objective:

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: Operators, Data types, Variables, Arrays, Control Statements, Methods & Classes, Inheritance, Package and Interface, Exception Handling, Multithread programming, I/O, Java Applet, String handling, Networking, Event handling.

Abstract Window Toolkit (AWT): Controls, Layout managers, Menus, Images, Graphics.

(Lecture 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.

(Lecture 08)

Unit III

JDBC: Connectivity Model, JDBC/ODBC Bridge, java.sql package, Connectivity to remote database, navigating through multiple rows retrieved from a database.

(Lecture 08)

Unit IV

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

(Lecture 08)

Unit V

Java Servlets: Basics, API basic, Life cycle, Running, Debugging, Thread-safe, HTTP Redirects, Cookies, Java Server pages (JSP).

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. An understanding of the principles and practice of object oriented programming in the construction of robust maintainable programs which satisfy the requirements.
2. Discuss the principles of inheritance and polymorphism and demonstrate through problem analysis assignments how they relate to the design of methods, abstract classes and interfaces.
3. Competence in the use of Java Programming language in the development of small to medium sized application programs that demonstrate professionally acceptable coding and performance standards.
4. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.

5. Cover the basics of creating APIs as well as allow students to explore the Java Abstract Programming Interface (API) and Java Collection Framework through programming assignments.

Text Books

1. Margaret, L. Y., *The Complete Reference- Internet*, Tata McGraw Hill.
2. Schildt, H., *The Complete Reference -JAVA2*, McGraw Hill.

Reference Books

1. Balagurusamy, E., *Programming in JAVA*, Tata McGraw Hill.
2. Dustin, R. Callway *Inside Servlets*, Addison-Wesley.
3. Steven, H., *Java2 Black Book*, Dreamtech.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester V
Engineering and Managerial Economics

Course Code: EHM503

L	T	P	C
3	1	0	4

Objective:

To understand the Scope of Economics, Demand Forecasting and Market Study.

Course Contents

Unit-I

Introduction: Meaning, Nature and Scope of Economics, Meaning of Science, Engineering and Technology, Managerial Economics and its scope in engineering perspective.

(Lecture 08)

Unit-II

Demand: Basic Concepts Demand Analysis, Law of Demand, Determinates of Demand, Elasticity of Demand-Price, Income and cross Elasticity, Uses of concept of elasticity of demand in managerial Decision.

(Lecture 08)

Unit-III

Forecasting: Demand forecasting Meaning, significance and methods of demand forecasting, production function, Laws of returns to scale & Law of Diminishing returns scale.

Short and Long run Cost curves: fixed cost, variable cost, average cost, marginal cost, Opportunity cost.

(Lecture 08)

Unit-IV

Market Study: Market Structure Perfect Competition, Imperfect competition: Monopolistic, Oligopoly, Duopoly sorbent features of price determination and various market conditions.

(Lecture 08)

Unit-V

Inflation: National Income, Inflation and Business Cycles Concept of N.I. and Measurement, Meaning of Inflation, Type causes & prevention methods, Phases of business cycle.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Concept and meaning of Economics/Managerial Economics, its applicability in context of Engineering
2. Concepts and theories of demand & supply, its estimation and responsible factors for them
3. Demand forecasting in business, Law of production and returns
4. Concepts of market, different kind of it, price mechanism in different conditions
5. Economic Status of the country by the concepts of GDP, GNP, NI, Inflation and their effects on business

Text Books

1. Koutsoyiannis, A : *Modern Microeconomics*, ELBS.
2. Kakkar, D.N., *Managerial Economics for Engineering*, New Age International publication.

Reference Books

1. Dwivedi, D.N., *Managerial Economics*, Vikas Publishing.
2. Maheshwari, Y., *Managerial Economics*, Prentice Hall of India.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester V
ANALYSIS AND DESIGN OF ALGORITHM (LAB)

Course Code: ECS552

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

1. To write a program in C/C++ for insertion and deletion into binary search tree.
2. To write a program in C/C++ for creation of a Red Black tree and all the associated operations.
3. To write a program in C/C++ for implementing an AVL tree and all the associated operations.
4. To write a program in C/C++ for multiplication of two matrices using Strassen's matrix multiplication method.
5. To write a program in C/C++ to solve Knapsack problem.
6. To write a program in C/C++ to implement shortest path algorithms (Dijkstra's and Bellman's Algorithms).
7. To write a program in C/C++ for finding the minimum cost Spanning Tree in a connected graph.
8. To write a program in C/C++ for solving 8-Queen's problem.
9. To write a program in C/C++ for finding the number of connected components in a Graph.

Course Outcome:

After completion of the course the students shall be able to understand:

1. Implementation of BST and RB Tree.
2. Implementation of AVL tree and operations.
3. Implementation of Dynamic and greedy approach and its problems.
4. Implementation of graph and its applications.

B.Tech (CSE) Semester V
JAVA PROGRAMMING (LAB)

Course Code: ECS554

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

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

Course Outcome:

After completion of the course the students shall be able to:

1. Understand better the object-oriented approach in programming. Students should be able to analyze and design a computer program to solve real world problems based on object-oriented principles.
2. Write computer programs to solve real world problems in Java
3. Learn and appreciate the importance and merits of proper comments in source code and API documentations
4. Write simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles.
5. Learn advance features in Java development.

English Communication and Soft Skills – V

Course Code: EHM599

L T P C

1 1 2 2

Objectives:

1. To enable the learners to inculcate the skills of technical writing.
 2. To enable the learners to proactively participate in Job Oriented activities.
 3. To enable the learners to be aware of corporate Skills.
-

Course Outcomes: At the end of the semester, the learners will be able to

1. Formulate their CVs along with cover letter in Job oriented perspective.
2. Communicate technically in functional context.
3. Proactively participate in Job Oriented activities. (Like Interview, GD etc.)
4. Aware of the skills required in corporate world.

Course Contents:

Unit – I: Job Oriented Skills

(10 Hours)

- a) Cover Letter
- b) Preparing Resume and Curriculum-Vitae
- c) Writing Joining Report

Unit – II: Technical Communication

(12 Hours)

- d) Technical description of engineering objects
- e) Data Interpretation: Tables, Charts, & Graphs
- f) Preparing Agenda & Minutes of the Meeting
- g) Technical Proposal: Types, Significance, Structure & AIDA
- h) Report Writing: Types, Structure & Steps towards Report writing

Unit- III: Interview Skills

(10 Hours)

- Branding yourself
- Interview: Types of Interview, Tips for preparing for Interview and Mock Interview
- Group Discussion: Do's and Don'ts of Group Discussion
- Negotiation skills

Unit – IV: Corporate Skills

(8 Hours)

- a) Corporate Expectation
- b) Service mindset: Selling a product - Ad made shows
- c) Goal setting
- d) Team Building & Leadership
- e) Professional Ethics

Reference Books:

- Raman Meenakshi & Sharma Sangeeta, “*Technical Communication-Principles & Practice*” Oxford University Press, New Delhi.
- Mohan K. & Sharma R.C., “*Business Correspondence of Report Writing*”, TMH, New Delhi.
- Chaudhary, Sarla “*Basic Concept of Professional Communication*” Dhanpat Rai Publication, New Delhi.
- Kumar Sanjay & Pushplata “*Communication Skills*” Oxford University Press, New Delhi.
- Agrawal, Malti “*Professional Communication*” Krishana Prakashan Media (P) Ltd. Meerut.

Note:

- For effective communication practice, groups will be changed weekly
- Class (above 30 students) will be divided in to two groups for effective teaching.

Evaluation Scheme

Internal Evaluation		External Evaluation		Total Marks
50 Marks		50 Marks		100
40 Marks (Progressive Evaluation) After each unit-completion: Assignments / oral Presentation	10 Marks (Attendance)	25 Marks Midway external assessment (Viva)*	25 Marks (External Viva) **	

Note: Midway external assessment of 25 marks will be submitted and considered with external evaluation with a total of 50 marks.

***Parameters of Midway external assessment (Viva)**

Knowledge of frequently asked questions	Body Language	Communication skills	Confidence	Voice Modulation	TOTAL
05 Marks	05 Marks	05 Marks	05 Marks	05 Marks	25 Marks

Note: To take corrective actions, midway assessment will be conducted by 2-member committee of Director's nominee (not by the faculty teaching English courses) and average of the two would be the 25 marks obtained by the students after two units are completed.

****Parameters of External Viva**

Knowledge of frequently asked questions	Body Language	Communication skills	Confidence	Voice Modulation	TOTAL
05 Marks	05 Marks	05 Marks	05 Marks	05 Marks	25 Marks

Note: External Viva will be conducted by 3-member committee comprising

- Faculty teaching the class
- English faculty from other college of the University (As approved by VC).
- T&P officer of other colleges of the University (As approved by VC).

Each member will evaluate on a scale of 25 marks and the average of three would be the 25 marks obtained by the students.

B.Tech (CSE) Semester V INDUSTRIAL TRAINING

Course Code: ECS591

L	T	P	C
0	0	0	2

Students will attend Industrial training of six 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 Principal 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

Course Outcome:

1. Ability to demonstrate the use, interpretation and application of an appropriate international engineering standard in a specific situation.
2. Ability to analyze a given engineering problem, identify an appropriate problem solving methodology, implement the methodology and propose a meaningful solution.
3. Ability to apply prior acquired knowledge in problem solving.
4. Ability to work in a team.
5. Ability to effectively communicate solution to problems (oral, visual, written)
6. Ability to manage a project within a given time frame
7. Ability to adopt a factual approach to decision making

ERP System

Course Code: ECS506

L	T	P	C
3	1	0	4

Objective:

To understand the factors that lead to the development of ERP System as well as to understand the working principles of different modules of ERP System.

Course Contents

Unit I

ERP & related technologies: Overview (evolution, Definition , Advantages), Business process Re-Engineering; Systems: Management information, Decision support, Executive information, Supply chain management, Implementation life cycle, future description of ERP.

(Lecture 08)

Unit II

ERP - Modules “An Overview”: Functions and Processes of Resource Management, Basic Modules of ERP System-HRD, Personnel Management, Training and Development, Skill Inventory , Reason for the growth of ERP market.

(Lecture 08)

Unit III

ERP - Resource Management Perspective: Material Planning and Control, Inventory, Forecasting, Manufacturing, Production Planning, Production Scheduling, Production Control, Sales and Distribution, Finance, Resource Management In global scenario, dynamic data management in complex global scenario.

(Lecture 08)

Unit IV

ERP – Information System Perspective: Evolution of Application Software Technology Management, Technology Partners, Supply Chain Management, Customer Relationship Management, Information Communication Technology, E-Business, EDI

(Lecture 08)

Unit V

ERP-Key Managerial Issues: Concept Selling, IT Infrastructure, Implication of ERP Systems on Business Organization, Critical success factors in ERP System, ERP Culture Implementation Issues, Resistance to change, Public Service and Organizations (PSO) Project, ERP Selection issues, Return on Investment, Pre and Post Implementation Issues.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Design and implement an e-commerce application with a shopping cart.
2. Integrate the waterfall model in the development of e-commerce applications.
3. Integrate user-centered design guidelines in developing user-friendly websites.
4. Evaluate the bullwhip effect in a supply chain, analyze the causes, and recommend possible solutions.
5. Analyze different types of portal technologies and deployment methodologies commonly used in the industry.
6. Analyze the effectiveness of network computing and cloud computing policies in a multi-location organization.
7. Analyze real business cases regarding their e-business strategies and transformation processes and choices.

Text Books

1. Leon, A., *Enterprise Resource Planning*, Tata McGraw Hill.

Reference Books

1. Sadagopan, S. *Enterprise Resource Planning*, Tata McGraw Hill.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester V
MOBILE COMMUNICATION

Course Code: ECS507

L	T	P	C
3	1	0	4

Objective:

The objective of this course is to understand fundamental concepts of mobile computing. These include mobility and service management, data management, routing in mobile ad hoc and sensor networks, and security issues for mobile systems

Course Contents

Unit I

Introduction: Issues in mobile computing, Study of Electromagnetic Spectrum: Radio wave, Microwave, Infrared, Overview of wireless communication, Cellular concept, sharing of Wireless channels: FDMA, TDMA, CDMA.

(Lecture 08)

Unit II

Global System for Mobile Communication (GSM): Architecture, Mobility Management, and Network signaling; General Packet Radio Services (GPRS): GPRS architecture, GPRS Network nodes.

(Lecture 08)

Unit III

Mobile Data Communication: WLANs (Wireless LANs); IEEE 802.11 standard; Mobile IP; Wireless Application Protocol (WAP); Mobile Internet Standards; WAP Gateway and Protocols; Wireless Markup Languages (WML).

(Lecture 08)

Unit IV

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

(Lecture 08)

Unit V

Wireless Local Loop (WLL): Architecture, Technologies; Global Mobile Satellite Systems; Case studies of Iridium and Global star systems; Bluetooth technology and Wi-Max.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Explain brief introduction to Mobile technology and generations.
2. Understand the WLAN Communication.
3. Understand 3 Generation services
4. Understand Ad hoc network protocols
5. Understand wireless application protocols & its security

Text Books

1. Lin, Y. B. and Chlamatac, I, *Wireless and mobile Networks Architecture*, John Wiley & Sons.
2. Pandya, R., *Mobile & Personnel communication Systems and Services*, Prentice Hall India.
3. Jochen, S, *Mobile communications*, Pearson Education.

Reference Books:

1. Talukdar, A. K. and Yaragal, R., *Mobile Computing*, Tata McGraw Hill.
2. Theodore, S. R., *Wireless Communication- Principles and Practices*, Pearson Education.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester V
MULTIMEDIA AND ANIMATION

Course Code: ECS509

L	T	P	C
3	1	0	4

Objective:

To learn the core knowledge of multimedia systems and animation.

Course Contents

Unit I

Multimedia: History, Objects, Scope in Business and Work, Production and Planning of Multimedia applications, Hardware, Memory and Storage devices, Communication devices, Software, Tools: Presentation and Object generation, Video, Sound, Image capturing, Authoring, Card and Page based authoring.

(Lecture 08)

Unit II

Production and Planning: Multimedia building blocks, Text, Sound (MIDI), Digital Audio File Formats, MIDI under windows environment, Audio and Video capture.

(Lecture 08)

Unit III

Multimedia Techniques: Basic drawing, Advance animations, Macromedia products, Creating multilayer, Combining interactivity and multiple scenes, Creating transparency effects using text in Flash, Flash animation.

(Lecture 08)

Unit IV

Digital Audio: Concepts, Sampling variables, Compression of sound: Loss-Less, Lossy and silence compressions.

(Lecture 08)

Unit V

Representation and Compression: Multimedia monitor bitmaps, Vector drawing, Lossygraphiccompression, Colors, Image file formatted animations image standards: JPEG compression, Video representation, Video compression, MPEG standards, MHEG standards; Multimedia Applications, Planning and Costing proposal preparation, and Financing, Case study of a typical industry.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. The main focus emphasizes on content related to introduction of multimedia, it's applications, supporting hardware and hardware tools which provide basic information about multimedia
2. It provide the basic information about the phase performing planning and production of a multimedia application using it's objects like text, sound and their specifications like MIDI with proper capturing.
3. It emphasizes on multimedia drawing tools and techniques with the effect of animation using multi layer concepts supported by flash incorporating text, audio, video and graphics.
4. It concentrates on different compression approaches like lossy and lossless with the specifications of sampling variables associated with digital audio
5. It concentrates on image and video standards using JPEG, MPEG, MHEG along with color models and multimedia monitor bitmaps to properly represent a multimedia application.

Text Books

1. Andreas H., *Multimedia Basics*, Firewall Media.
2. Tay V., *Multimedia: Making It Work*, Tata McGraw Hill.
3. Buford J. M. K, *Multimedia Systems*, Addison-Wesley.

Reference Books

1. Agarwal R. and Tiwari B.B., *Multimedia Systems*, Excel Books.
2. Rosch W. L., *Multimedia Bible*, Sams Publishing.
3. Ken M., Croteau J., *Flash 4 Web Special Effects, Animation And Design Handbook*, Dreamtech.
4. Villamil-Casanova J., Molina L., *Multimedia-Production, Planning And Delivery*, Pearson Education.

*Latest editions of all the suggested books are recommended.

Semester V
DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP511

L T P C
1 0 0 1

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

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

The above is 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).

Head of Department would be display GP marks on notice board in prescribed format after IInd & IIIrd CT in semester:

S N o	Enroll No.	Student Name	Dress code	Participation in Conferences /Workshops / Seminars	Participation in guest lectures, invited talks and special technical sessions	Participation in community Services	Participation in Culture & extra curriculum activities, Department Club Activities	Participation in sports/ co- curricular activities	General Behavior	Any Extra Achievement
			(5)	(15)	(20)	(10)	(20)	(20)	(5)	(5)
Responsible for marks			Mentor	Head	Head	Mentor	Cultural Events Coordinator & Department Club Coordinator	Sports Coordinator	Mentor	Director or Principal

B.Tech (CSE) Semester VI

ARTIFICIAL INTELLIGENCE

Course Code: ECS601

L	T	P	C
3	1	0	4

Objective:

To learn the techniques of artificial intelligence to the computer.

Course Contents

Unit I

Artificial Intelligence: Issues, Techniques, Problems, Importance and areas of AI, Problem solving state space search; DFS, BFS Production: System, Problem characteristics; Heuristic Search Techniques, Generate and Test, Hill Climbing, Best First Search, Problem reduction, Constraint satisfaction, Crypt arithmetic and problems.

(Lecture 08)

Unit II

Knowledge representation: Mapping, Approaches, Issues, Representing simple facts in logic, Representing instance and relationships, Resolution and natural deduction, Representing knowledge using rules, Procedural vs. Declarative knowledge, Logic programming, Forward vs. Backward chaining, Matching & control knowledge.

(Lecture 08)

Unit III

AI programming language: Prolog: Objects, Relationships, Facts, Rules, Variables, 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; Monotonic Reasoning: Logics for Non-Monotonic reasoning; Implementation issues; Implementation: DFS & BFS.

(Lecture 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.

(Lecture 08)

Unit V

Expert System: Definition and Characteristics, Representing and using Domain Knowledge, Expert system shells Knowledge Engineering, Knowledge acquisition, Expert system life cycle & Expert system tools, MYCIN & DENDRAL.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Apply artificial intelligence techniques, including search heuristics, knowledge representation, planning and reasoning
2. describe the key components of the artificial intelligence (AI) field
3. explain search strategies
4. solve problems by applying a suitable search method
5. compare minimax search and alpha-beta pruning in game playing
6. analyze and apply knowledge representation
7. describe and list the key aspects of planning in artificial intelligence
8. analyze and apply probability theorem and Bayesian networks
9. describe the key aspects of intelligent agents
10. differentiate the key aspects of evolutionary computation, including genetic algorithms and

genetic programming

Text Books

1. Rich, E. and Knight, K., *Artificial Intelligence*, Tata McGraw Hill.

Reference Books

1. Cloksin, W.F., Mellish, C.S., *Programming In Prolog*, Narosa Publishing House.
2. Janakiraman, V.S., Sarukesi, K., *Foundation of Artificial Intelligence & Expert System*, Macmillan.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VI
COMPUTER GRAPHICS

Course Code: ECS603

L	T	P	C
3	1	0	4

Objective:

To understand the basics of Computer Graphics, Visual Data processing, various mathematical concepts used in displaying graphics.

Course Contents

Unit I

Computer Graphics: Areas, Overview of Graphic systems, Graphics primitives, Video-display devices, Raster-scan and Random-scan systems, Plasma displays, LCD, Plotters, Printers, Graphics monitors, Workstations and devices, Input techniques.

(Lecture 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.

(Lecture 08)

Unit III

2-D Geometrical Transforms: Translation, Scaling, Rotation, Reflection and Shear, 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.

(Lecture 08)

Unit IV

3-D Object Representation: Polygon surfaces, Quadric Surfaces, Spline representation, Hermit 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, General projection transforms and clipping.

(Lecture 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.

(Lecture 08)

Course Outcome:

After completion of the course the students shall:

1. Know and be able to select among models for lighting/shading: Color, ambient light; distant and light with sources; Phong reflection model; and shading (flat, smooth, Gourand, Phong).
2. Know and be able to use and select among current models for surfaces (e.g., geometric; polygonal; hierarchical; mesh; curves, splines, and NURBS; particle).
3. Know and be able to design and implement model and viewing transformations, the graphics pipeline and an interactive render loop with a 3D graphics API.
4. Be able to design and implement models of surfaces, lights, sounds, and textures (with texture transformations) using a 3D graphics API.
5. Be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.

Text Books

1. Hearn, D. and Pauline, B. M., *Computer Graphics C Version*, Pearson Education.
2. Foley, C., *Computer Graphics Principles & Practice*, Pearson Education.
3. Harrington, S., *Computer Graphics*, McGraw Hill.

Reference Books:

1. Zhigand, X., Roy, P., *Computer Graphics*, Tata McGraw Hill.
2. Rogers, D. F., *Procedural Elements for Computer Graphics*, McGraw Hill.
3. Neuman, W. M. and Sproul R. F., *Principles of Interactive Computer Graphics*, McGraw Hill.
4. Harrington, S., *Computer Graphics*, McGraw Hill.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VI

COMPUTER NETWORK

Course Code: ECS608

L	T	P	C
3	1	0	4

Objective:

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

Course Contents

Unit I

Network: Goals, Applications, Components; Direction of Data flow networks, Categories, Types of Connections, Topologies, Protocols and Standards, ISO / OSI model, Transmission Media, Types, ISDN, Routers.

(Lecture 08)

Unit II

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, Ethernet: IEEE-802.3, 802.4, 802.5, 802.11, FDDI, SONET, Bridges.

(Lecture 08)

Unit-III

Network Layer: Internet works, Packet Switching and Datagram Approach, IP addressing methods, Sub netting, Routing: Distance Vector, Link State.

(Lecture 08)

Unit IV

Transport Layer: Duties, Multiplexing, Demultiplexing, Sockets.

Protocols: User Datagram Protocol (UDP), Transmission Control Protocol (TCP), Congestion Control, Quality of Services (QOS), Integrated Services.

(Lecture 08)

Unit V

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

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Explain networking protocols and their hierarchical relationship hardware and software. Compare protocol models and select appropriate protocols for a particular design.
2. Manage multiple operating systems, systems software, network services and security. Evaluate and compare systems software and emerging technologies.
3. Develop solutions for networking and security problems, balancing business concerns, technical issues and security.
4. Explain concepts and theories of networking and apply them to various situations, classifying networks, analyzing performance and implementing new technologies.
5. Identify infrastructure components and the roles they serve, and design infrastructure including devices, topologies, protocols, systems software, management and security. Analyze performance of enterprise network systems.
6. Effectively communicate technical information verbally, in writing, and in presentations.
7. Use appropriate resources to stay abreast of the latest industry tools and techniques analyzing the impact on existing systems and applying to future situations.

Text Books

1. Forouzan, B.A., *Data Communication and Networking*, Tata McGraw Hill.
2. Achyut, S. G., *Data Communications & Networks*, Tata McGraw Hill.
3. Forouzan, B.A., *TCP/IP Protocol Suit*, Tata McGraw Hill.

Reference Books

1. Stallings, W., *Data and Computer Communication*, Macmillan Press.
2. Keshav, S., *An Engineering Approach on Computer Networking*, Addison-Wesley.
3. Larry, L.P. and Peter, S.D., *Computer Network*, Harcourt Asia.

*Latest editions of all the suggested books are recommended.

Semester VI

English Communication & Soft Skills – VI

Course Code: EHM649

L T P C
1 1 2 2

Objective: To enhance students' soft skills and personality by inculcating values in them for suitable employability.

Course Content:

Unit -1 Soft Skills and Personality Development (06 hours)

- a) Introduction to Soft Skills
- b) Classification of Soft Skills
- c) Manners and Etiquettes
- d) Traits of Leadership

Classroom Activity: (02 Hours)

Listening: Involving the students listen lectures on the above topics delivered by their teacher

Speaking: Enabling the students speak on the above topics

Writing: Making the students write on the given topics

Unit -2 Technical Vocabulary and Presentation (06 hours)

- a) Abbreviations and Technical terms of Computer Science
- b) Writing Paragraph on Eminent Personalities in the field of Computer Science and Information Technology: Charles Babbage, Dennis Ritchie, Larry Page, Tim Berners Lee, Larry Ellison, Bill Gates, Michael Dell, Philip Don Estridge, Charles Ranlett Flint, Martin Cooper, Steve Jobs and Mark Elliot Zuckerberg.
- c) Speech on Eminent Personalities in the field of Computer Science and Information Technology: Sundar Pichai, N. R. Narayana Murthy, Azim Premji, Nandan Nilekani, Sam Pitroda and Pranav Mistry.
- d) Presentation on the Profile of Leading Companies of Information Technology: Microsoft Corporation, Oracle Corporation, IBM (International Business Machines), SAP, Symantec Corporation, EMC and Hewlett Packard Enterprise
- e) Writing Scientific and Technical Paper

Classroom Activity: (06 Hours)

Listening: Involving the students listen lectures on the above topics delivered by their teacher

Speaking: Enabling the students speak on the above topics

Writing: Making the students write on the given topics

Unit -3 Values and Ethics (06 hours)

- a) Values and Ethics
- b) Different Attitudes to Work
- c) Ethics at Work Place
- d) Professional Ethos and Code of Professional Ethics

Classroom Activity: (04 Hours)

Listening: Involving the students listen lectures on the above topics delivered by their teacher

Speaking: Enabling the students speak on the above topics

Writing: Making the students write on the given topics

Unit -4 Job Interview Strategies

(02 hours)

- a) Body Language
- b) Debate on current issues and Leading Companies of Information Technology
- c) Group Discussion
- d) Preparing Relevant Probable Questions for Interview
- e) Mock Interview

Classroom Activity:

(08 Hours)

Listening: Involving the students listen lectures on theoretical part delivered by their teacher

Speaking: Enabling the students speak effectively during group discussion and mock interview

Writing: Making the students write important points during group discussion

Text Books:

1. Mitra Barun K., *Personality Development and Soft Skills*, O.U.P., New Delhi. 2012.
2. Onkar R.M., *Personality Development and Career Management: A Pragmatic Perspective*, S. Chand & Co. Ltd., New Delhi. 2011.
3. Mishra Sunita & Muraliksishra C., *Communication Skills for Engineers*, Pearson Education, New Delhi.

Reference Books:

1. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practices*, O.U.P. New Delhi. 2008.
2. Chhabra T N, *Business Communication*, Sun India Pub. New Delhi.
3. Sehgal M.K. & Khetrapal Vandana, *Business Communication*, Excel Books, New Delhi.
4. Newstrom John W., *Organizational Behaviour: Human Behaviour at work*- Tata McGraw Hill.
5. Luthans Fred, *Organizational Behaviour*-Tata McGraw Hill.
6. Sanjay Kumar & Pushp Lata, *Communication Skills*, Oxford University Press.
7. Govindarajan M., *Engineering Ethics*, Prentice Hall (India), New Delhi

Learning Outcome:

1. Students will be able to communicate effectively.
2. They will be able to develop their personality and soft skills.
3. They will be able to face interview confidently.
4. They will be able to participate actively in group discussion.
5. They will be able to inculcate values and ethics in their life.
6. They will be able to develop their competence for suitable job in a good organisation.

Evaluation Scheme

Evaluation: 100 Marks

<i>Internal Assessment</i>	<i>External Written Exam</i>	<i>Total</i>
40	60	100

Internal Assessment: 40 Marks

<i>Best Two out of Three CTs</i>	<i>Attendance</i>	<i>Assignment/Viva/Lab Work</i>	<i>Total</i>
20	10	10	40

B.Tech (CSE) Semester VI
CYBER LAW & INFORMATION SECURITY

Course code: ECS610

L	T	P	C
3	1	0	4

Objective: The objective of this subject is to make the individual aware of cybercrimes and acquire a critical understanding of cyber laws in order to prevent their information systems from cybercrimes and to give the learners in depth knowledge of Information security.

Course Contents

Unit-I

History of Information Systems and its Importance, basics, Changing Nature of Information Systems, Need of Distributed Information Systems, Role of Internet and Web Services, Information System Threats and attacks, Classification of Threats and Assessing Damages Security in Mobile and Wireless Computing: Security Challenges in Mobile Devices, Authentication Service Security, Security Implication for organizations, Laptops Security Functions of various networking components- routers, bridges, switches, hub, gateway.

(Lecture 08)

Unit-II

Basic Principles of Information Security, Confidentiality, Integrity Availability and other terms in Information Security, Information Classification and their Roles. Security Threats to Ecommerce, Virtual Organization, and Business Transactions on Web, E Governance and EDI,

Concepts in Electronics payment systems, E Cash, Credit/Debit Cards.

(Lecture 08)

Unit-III

Physical Security: Needs, Disaster and Controls, Basic Tenets of Physical Security and physical Entry Controls. Access Control- Biometrics, Factors in Biometrics Systems, Benefits, and Criteria for selection of Biometrics, Design Issues in Biometric Systems, Interoperability Issues, Economic and Social Aspects, Legal Challenges.

(Lecture 08)

Unit-IV

Model of Cryptographic Systems, Issues in Documents Security, System of Keys, Public Key Cryptography, Digital Signature, Requirement of Digital Signature System, Finger Prints, Firewalls, Design and Implementation Issues, Policies, Network Security: Basic Concepts, Dimensions, Perimeter for Network Protection, Network Attacks, Need of Intrusion Monitoring and Detection, Intrusion Detection. Virtual Private Networks: Need, Use of Tunneling with VPN, Authentication Mechanisms, Types of VPNs and their Usage, Security Concerns in VPN.

(Lecture 08)

Unit-V

Laws, Investigation and Ethics: Cyber Crime, Information Security and Law, Types & Overview of Cyber Crimes, Cyber Law Issues in E-Business Management, Overview of Indian

IT Act, Ethical Issues in Intellectual property rights, Copy Right, Patents, Data privacy and Protection, Domain Name, Software piracy, Plagiarism, Ethical hacking.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Identify infrastructure components and the roles they serve, and design infrastructure including devices, topologies, protocols, systems software, management and security. Analyze performance of enterprise network systems.

2. Effectively communicate technical information verbally, in writing, and in presentations.
3. Use appropriate resources to stay abreast of the latest industry tools and techniques analyzing the impact on existing systems and applying to future situations.
4. Explain the concepts of confidentiality, availability and integrity in Information Assurance, including physical, software, devices, policies and people. Analyze these factors in an existing system and design implementations

Text Books:

1. Godbole, “Information Systems Security”, Willey
2. Merkov, Breithaupt, “Information Security”, Pearson Education

Reference Books:

1. Yadav, “Foundations of Information Technology”, New Age, Delhi
2. Schou, Shoemaker, “Information Assurance for the Enterprise”, Tata McGraw Hill
3. Sood, “Cyber Laws Simplified”, McGraw Hill

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VI
ARTIFICIAL INTELLIGENCE (LAB)

Course Code: ECS651

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

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

Course Outcome:

After completion of the course the students shall be able to understand:

1. Prolog programming language with implementing different types of problems like tower of Hanoi, searching problems, hill climbing problem and compound object creation.

B.Tech (CSE) Semester VI
COMPUTER NETWORK (LAB)

Course Code: ECS654

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

1. To write a program in C illustrating use of TCP Sockets.
2. To write a program in C illustrating use of simple UDP.
3. To write a program in C illustrating use of Raw Sockets (like packet capturing and filtering) .
4. To write a program in C illustrating concept of Sliding Window Protocol.
5. To write a program in C for Address Resolution Protocol.
6. To write a program in C for implementing Routing Protocols.
7. To write a program in C illustrating for Open Shortest Path first Routing Protocol.

Course Outcome:

After completion of the course the students shall be able to:

1. Implementing networking protocols of various OSI layers in C / C++ / Java.
2. Implementing routing protocols in C / C++ / Java.
3. Study of various networking and inter – networking devices.
4. Study of some important computer networking tools in UNIX / Windows environment.
5. Studying client – server programming using TCP and UDP sockets
6. Study of important command line utilities involved in computer networks

B.Tech (CSE) Semester VI
COMPUTER GRAPHICS (LAB)

Course Code: ECS653

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

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

Course Outcome:

After completion of the course the students shall be able to:

1. Describe the general software architecture of programs that use computer graphics.
2. Discuss system architecture for computer graphics. ...
3. Use a current 3D graphics API

B.Tech (CSE) Semester VI

REAL TIME OPERATING SYSTEM

Course Code: ECS606

L	T	P	C
3	1	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

Real Time System: Concept; Priorities; Embedded Systems; Task; Classification & Requirements; Deadlines; Soft and Hard Real Time Systems.

(Lecture 08)

Unit II

Real Time Operating System: Evolution, Firm Real Time Systems, Task Management, InterProcess Communication, Case Studies: Maruti II, HART OS, VRTX.

(Lecture 08)

Unit III

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

(Lecture 08)

Unit IV

Tools: Programming Languages, Real Time Databases.

Applications: 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)

(Lecture 08)

Unit V

Fault: Concept, Classes, Fault Tolerant Real Time System, Clock; Need, Synchronization, Issues in Real Time Software Design.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Describe the function of real time system
2. Analyze and design a real-time system.
3. Apply formal methods for scheduling real-time systems
4. Describe the communication method
5. Characterize and describe reliability and fault tolerance issues and approach.

Text Books

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

Reference Books

1. Levi, S. T. and Agarwal K., *Real Time Systems*, McGraw Hill.
2. Joseph, M., *Real Time System: Specification, Validation & Analysis*, Prentice Hall of India.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VI SOFT COMPUTING

Course Code: ECS607

L	T	P	C
3	1	0	4

Objective:

To provide 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.

Artificial Neural Networks: Architecture, Learning: Rules, Paradigms, Supervised, Unsupervised and Reinforcement Learning; Training Algorithms: Perceptions, Training rules, Back Propagation Algorithm, Multilayer Perception Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks.

(Lecture 08)

Unit II

Fuzzy Logic: Fuzzy Logic, Classical and Fuzzy Sets, Membership Function; Fuzzy rule generation.

(Lecture 08)

Unit III

Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations.

(Lecture 08)

Unit IV

Fuzzy Arithmetic: Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice, Equations, Logic: Classical, Multi-valued, Propositions; Qualifiers, Linguistic Hedges.

(Lecture 08)

Unit V

Uncertainty based Information: Information & Uncertainty, Non specificity of fuzzy & crisp sets, Fuzziness of Fuzzy Sets.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Understand the need for Soft Computing;
2. Understand different uses of Soft Computing in various areas;
3. Understand the steps involved in the development of Soft Computing;
4. Acquire a working knowledge of some popular tools for Soft Computing;
5. Design, implement and verify computing systems by using appropriate Soft Computing techniques and tools

Text Books

1. Simon, H., *Neural Networks*, Prentice Hall of India.
2. Kosko, B., *Neural Networks for Signal Processing*, Prentice Hall of India.
3. Klir, G. and Youn, B., *Fuzzy Logic & Fuzzy sets*, Prentice Hall of India.

Reference Books:

1. Kazuo, T., *An Introduction to Fuzzy Logic for Practical Applications*, Springer.

*Latest editions of all the suggested books are recommended.

MICROPROCESSOR & APPLICATION

Course Code: EEC606

L	T	P	C
3	1	0	4

Objective:

To study the evolution of microprocessors & how to do assembly language programming with the help of interfacing.

Course Contents

Unit I

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. **(Lecture 08)**

Unit II

Assembly Language Programming: Addressing Modes and instruction set of 8086, Arithmetic and Logic instructions, Program Control Instructions (jumps, conditional jumps, and subroutine call), Loop and string instructions, Assembler Directives. **(Lecture 08)**

Unit III

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 Operations. **(Lecture 08)**

Unit IV

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. **(Lecture 08)**

Unit V

Peripheral Interfacing (Contd.): 8259 Programmable Interrupt controller, 8237 DMA controller Concept of Advanced 32 bit Microprocessors: Pentium Processor. **(Lecture 08)**

Course Outcome:

After completion of the course the students shall be able to:

1. Understanding the basic building blocks of a microcontroller device in general. TM
2. Knows the terminologies like embedded and external memory devices,
3. CISC and RISC processors etc. TM
4. Knows the architecture and silent features of 8051 microcontrollers.
5. n-depth understanding of specialist bodies of knowledge within the engineering discipline.
6. 2.1 Application of established engineering methods to complex engineering problem solving.
7. 2.2 Fluent application of engineering techniques, tools and resources.
8. 2.3 Application of systematic engineering synthesis and design processes.

Text Books:

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

Reference Books:

1. Liu and Gibson G.A., *Microcomputer Systems: The 8086/8088 Family*, Prentice Hall (India).
2. Brey, Barry B., *INTEL microprocessors*, Prentice Hall (India).
3. Ram B., *Advanced Microprocessor & Interfacing*, Tata McGraw Hill.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VI E-COMMERCE

Course Code: ECS609

L	T	P	C
3	1	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

E-Commerce: Definition, History, Advantages and Disadvantages, Types, E-business vs. E-commerce, E-Commerce: technology and prospects, incentives for engaging in electronic commerce, needs of e-commerce, E-commerce models.

(Lecture 08)

Unit II

Network Infrastructure for E-Commerce: Industry Framework, Internet and Intranet based E-commerce- Issues, problems and prospects, Network Infrastructure, Network Access Equipment; Broad band telecommunication (ISDN, ATM, FRAMERELAY).

(Lecture 08)

Unit III

Mobile Commerce:

Introduction: Mobile commerce, advantages and disadvantages, e-commerce vs m-commerce, Mobile computing: Framework, Applications; Wireless application protocol, WAP technology; Mobile Information devices.

(Lecture 08)

Unit IV

Electronic Payment Systems: Overview, SET protocol, payment gateway, certificate, Types; Digital tokens: Smart cards, Credits Cards, Magnetic strip cards, E-cheques based EPS; online bank Risk.

On-line Commerce Environments: Servers and commercial environments; Netscape product line; Netscape commerce server; Microsoft internet explorer and servers; open market.

(Lecture 08)

Unit V

EDI: Applications in business, Legal: E-commerce law, Forms of agreement, Government policies and Agenda, EDI vs. E-Commerce, Value added network, EDI versus Internet and EDI over Internet.

Electronic Commerce Providers: On-line Commerce options: Company profiles.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Understand what is meant by the term 'e-commerce' and the need of ecommerce.
2. Understand the role of information systems in organizations, the strategic management processes, and the implications for the management.
3. Learn about the importance of managing organizational change associated with information systems implementation.
4. Use the application software skills such as analyzing spreadsheets, creating database, and Web browsing, that they have learned in other courses to apply to real-world business problems.
5. Learn about the importance of managing organizational change associated with information systems implementation.

Text Books

1. Kalakota, R., *Frontiers of E-Commerce*, Addison-Wesley.
2. Leon, A., *Enterprise Resource Planning*, Tata McGraw Hill.

Reference Books

1. Sadagopan, S. *Enterprise Resource Planning*, Tata McGraw Hill.
2. Bajaj, K. and Nag, D., *E-Commerce: The cutting edge of Business*, Tata McGraw Hill.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VI

Big Data Analytics

Course code: ECS-611

L-3, T-1, P-0, C-4

Objective

This course provides practical foundation level training that enables immediate and effective participation in big data projects. The course provides grounding in basic and advanced methods to big data technology and tools, including MapReduce and Hadoop and its ecosystem.

Course Content

Unit I

INTRODUCTION TO BIG DATA: Introduction – distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

(Lectures 08)

Unit-II

INTRODUCTION HADOOP: Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

(Lectures 08)

Unit-III

HADOOP ARCHITECTURE: Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering –Monitoring & Maintenance.

(Lectures 08)

Unit-IV

HIVE AND HIVEQL, HBASE:Hive Architecture and Installation, Comparison with Traditional Database, HiveQL – Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase conceptsAdvanced Usage, Schema Design, Advance Indexing - PIG, Zookeeper - how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

(Lectures 08)

Unit-V

Big Data Analytics: Introduction to Big data Business Analytics - State of the practice in analytics role of data scientists - Key roles for successful analytic project - Main phases of life cycle - Developing core deliverables for stakeholders.

(Lectures 08)

Course Outcome

After the successful completion of the course the student will be able to understand:

1. Demonstrate knowledge of statistical data analysis techniques used in decision making.
2. Apply principles of Data Science to the analysis of large-scale problems.
3. Familiarity of technologies like Hadoop framework, Hive.

Text Books:

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk deroos et al. , “Understanding Big data ”, McGraw Hill, 2012.

Reference Books:

1. Tom White, “HADOOP: The definitive Guide” , O Reilly 2012.
2. Vignesh Prajapati, “Big Data Analytics with R and Haoop”, Packet Publishing 2013.
3. Tom Plunkett, Brian Macdonald et al, “Oracle Big Data Handbook”, Oracle Press, 2014
4. Jy Liebowitz, “Big Data and Business analytics”, CRC press, 2013.
5. Chris Eaton, Dirk Deroos, Tom Deutsch et al., “Understanding Big Data”, McGrawHill, 2012.

*Latest editions of all the suggested books are recommended.

Semester VI

DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP611

L T PC

1 0 0 1

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

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

The above is 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).

Head of Department would display GP marks on notice board in prescribed format after IInd & IIIrd CT in semester:

S N o		Enroll No.	Student Name	Dress code	Participation in Conferences /Workshops / Seminars	Participation in guest lectures, invited talks and special technical sessions	Participation in community Services	Participation in Culture & extra curriculum activities, Department Club Activities	Participation in sports/ co- curricular activities	General Behavior	Any Extra Achievement
				(5)	(15)	(20)	(10)	(20)	(20)	(5)	(5)
	Responsible for marks			Mentor	Head	Head	Mentor	Cultural Events Coordinator & Department Club Coordinator	Sports Coordinator	Mentor	Director or Principal

WEB-TECHNOLOGY (DESIGN & ARCHITECTURE USING .NET)

Course Code: ECS701

L	T	P	C
3	1	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

Basics of Web-Technology: Web Pages; HTML; Designing static HTML Pages using tags: Textbox, Button, Radio Button, Check Box, Text Area, Image, Links, Anchors, Table, Lists, Dropdown List; Form Submission using Get and Post Methods; JavaScript: Adding JavaScript to static HTML pages; Publishing a website.

(Lecture 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 Specifications, Building, Packaging, Deploying, and Administering Applications and Types.

(Lecture 08)

Unit III

Visual Studio .Net: Installing .Net Framework (2.0, 3.0 &4) and the Visual Studio .NET IDE. **ASP .Net:** Web Forms; Applications; Application Configurations; Server Controls: Using standard controls, Using Rich Controls, Using Validation Controls, Data Bound Controls, Data Source Controls.

(Lecture 08)

Unit IV

Designing ASP .Net Websites: Using Standard Controls on Master Pages; Designing Websites with Themes; Creating Custom Controls; ADO .Net, Connected vs. Disconnected Data Access;

(Lecture 08)

Unit V

Site Navigation: Navigation Control; Site Maps.**Security Mechanism:** Login Controls; Session Management; Localization and Globalization of yoursite; designing a Sample e-mail web application: Using Master Page, Standard Controls, JavaScript, AJAX; Cookies and Sessions; Uploading files and Data Bound Controls such as Grid View and Repeaters.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Ability to design a web model.
2. Aware to latest client web technology.
3. Understanding the behavior of server side script in web technology.
4. Learning to create validation in client side.
5. Learning to develop dynamic changes of contents of web side through technology.

Text Books

1. Hejsberg, A. and Wiltamuth, S., *C# Developers Guide*, Addison-Wesley.
2. Parihar, M., Ahmad, E., *ASP .Net Programming Bible*, Wiley.

3. Laura, L., Rafe, C., *Teach Yourself: Web Publishing with HTML and CSS in One Hour a Day*, Sams.

Reference Books

1. Greg, H., Jason, W., Saurabh, N., *C#-Net Developers Guide*, SyngRes.
2. Robinson, S., Jay, G., *C#*, Wrox Press Professional.

*Latest editions of all the suggested books are recommended.

CRYPTOGRAPHY AND NETWORK SECURITY

Course Code: ECS703

L	T	P	C
3	1	0	4

Objective:

- To gain knowledge about various cryptographic methods.

Course Contents

Unit I

Network Security: Attacks; Services & Mechanisms; Conventional Encryption: Classical Encryption Techniques, Model and Steganography. **(Lecture 08)**

Unit II

Encryption Schemes: DES: Standard, Strength; Block Cipher Design Principles; Block Cipher Modes of Operation: Triples DES; Placement & Encryption Function: Key Distribution, Random Number Generation, Placement of Encryption Function.

(Lecture 08)

Unit III

Public-Key Cryptography: Principles; RSA Algorithm; Key Management; Fermat's & Euler's Theorems; Primarily Miller Test; Chinese Remainder Theorem.

(Lecture 08)

Unit IV

Message Authentication & Hash Functions: Authentication: Requirements, Protocol, Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security Of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA).

Digital Signatures: Digital Signature Standard (DSS), Proof of Digital Signature Algorithm.

(Lecture 08)

Unit V

IP Security: Electronic Mail Security, Pretty Good Privacy (PGP), S/MIME, 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.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Basic understanding of network services & types of attacks.
2. Understand cryptography algorithms for encryption.
3. Understand principle of public cryptography.
4. Understand principle of authentications
5. Understand network security & virus attacks

Text Book

1. Stallings, W., *Cryptography and Network Security: Principles and Practice*, Prentice Hall.
2. Kahate, A., *Cryptography and Network Security*, Tata McGraw Hill.

Reference Book

1. Johannes, A. B., *Introduction to Cryptography*, Springer.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII
SOFTWARE PROJECT MANAGEMENT

Course Code: ECS704

L	T	P	C
3	1	0	4

Objective:

To learn the processes that exist primarily for supporting the management of software development, and are generally skewed toward addressing business concerns.

Unit I

Project Management: Introduction to Software Project Management, Need identification, Project Management Life Cycle, Project Initiation, Project Evaluation, Project Plan, Types of Project Plan, Milestones- Major and Minor

Software Metrics: What and Why, Role of Metrics and Measurement, Scope of Software Metrics, Types of Software Metrics: Project Metrics, Process Metrics, Product Metrics, and Function based Metrics

(Lecture 08)

Unit II

Life Cycle Phases: Project Life Cycle and Product Life Cycle, Engineering and Production Stages: Inception, Elaboration, Construction, Transition Phases.

Project Management Artifacts::The Artifact Sets: Management Artifacts, Engineering Artifacts, Programmatic Artifacts.

Project Planning: Objective, Milestone based planning, Resource Allocation, Critical Path, Project Elements, Size Estimation – Lines of Code (LOC), Work Breakdown Structures (WBS) and Function Point (FP), Effort Estimation, Cost Estimation

(Lecture 08)

Unit III

Project Scheduling: CPM, PERT, Gantt Chart, Cost-Time Relations, Re-works

Project Monitoring and Control: Dimensions of Project Monitoring and Control, Software Reviews, Type of Reviews – Inspections, Walkthroughs, Code Reviews

Improving Software Economics: Reducing Software Product Size; Improving Software Processes: Improving Team, Effectiveness, Improving Automation, Achieving Required Quality, Peer Inspections.

(Lecture 08)

Unit IV

Risk Management: Software Risks, Risk Identification, Risk Mitigation, Monitoring and Management

Change Management: Exploring Challenges, Risking Comfort Zone, Managing Change

Configuration Management: Baseline, Configurations Items(CIs), SCM Process, Version Control, Configuration Audit

(Lecture 08)

Unit V

Quality Management: Quality Concept, Quality Control, Quality Assurance, ISO 9000 certification for software industry; SEI capability maturity model (CMMI); ISO vs. SEI CMMI, Six-Sigma Overview, Software Reviews, Software Measurements and metrics for Quality

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Learn the processes that exist primarily for supporting the management of software development, and are generally skewed toward addressing business concerns
2. Know concepts to address specific management needs at the individual, team, division and/or organizational level
3. Have Practical applications of project management to formulate strategies allowing organizations to achieve strategic goals
4. A perspective of leadership effectiveness in organizations
5. Team-building skills required to support successful performance
6. Manage the selection and initiation of individual projects and of portfolios of projects in the enterprise.

7. Conduct project planning activities that accurately forecast project costs, timelines, and quality. Implement processes for successful resource, communication, and risk and change management.
8. Demonstrate a strong working knowledge of ethics and professional responsibility.
9. Demonstrate effective organizational leadership and change skills for managing projects, project teams, and stakeholders.

TEXT BOOKS:

1. Walker, R., *Software Project Management*, Pearson Education.

REFERENCE BOOKS:

1. Shere, K. D., *Software Engineering and Management*, Prentice Hall

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII
WEB TECHNOLOGY(DESIGN AND ARCHITECTURE USING .NET) (LAB)

Course Code: ECS751

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

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

Course Outcome:

After completion of the course the students shall be able to:

1. Understand and Implementweb pages through coding using HTML and DHTML.
2. Understand and Implement the BROWSER SIDE SCRIPTING .
3. Design and implement dynamic websites with good aesthetic sense of designing.
4. Good grounding of Web Application Terminologies, Internet Tools and other web services.
5. Understand the use of Connecting to Databases in jsp pages

B.Tech (CSE) Semester VII
CRYPTOGRAPHY AND NETWORK SECURITY (LAB)

Course Code: ECS752

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

1. To write a program in C to implement Caesar cipher.
2. To write a program in C to implement “Vigenere Cipher” technique.
3. To write a program in C to implement Extended Euclid Algorithm.
4. To write a program in C to implement Chinese remainder theorem.
5. To write a program in C to implement Diffie Hellman algorithm
6. To write a program in C to implement Play-fair Cipher.
7. To write a program in C to implement RSA algorithm.
8. To configure a mail agent to Digital Signature and send a mail and verify the correctness of this system.
9. To configure the Windows Firewall feature in Windows XP Service Pack 2.

Course Outcome:

After completion of the course the students shall be able to:

6. Understand and Implement basic Cryptography algorithm like Caesar Cipher.
7. Understand and Implement RSA algorithm.
8. Basic Understanding of Digital Signature.
9. Learn about implementation of various security algorithms.
10. Understand the use of public and private key

B.Tech (CSE) Semester VII PATTERN RECOGNITION

Course Code: ECS711

L	T	P	C
3	0	0	3

Unit-I

Introduction: Basics of pattern recognition, Design principles of pattern recognition system, Learning and adaptation, Pattern recognition approaches, Mathematical foundations – Linear algebra, Probability Theory, Expectation, mean and covariance, Normal distribution, multivariate normal densities, Chi squared test.

(Lecture 08)

Unit-II

Statistical Pattern Recognition: Bayesian Decision Theory, Classifiers, Normal density and discriminate functions.

(Lecture 08)

Unit – III

Parameter estimation methods: Maximum-Likelihood estimation, Bayesian Parameter estimation, Dimension reduction methods - Principal Component Analysis (PCA), Fisher Linear discriminate analysis, Expectation-maximization (EM), Hidden Markov Models (HMM), Gaussian mixture models.

(Lecture 08)

Unit - IV

Nonparametric Techniques: Density Estimation, Parzen Windows, K-Nearest Neighbor Estimation, Nearest Neighbor Rule, Fuzzy classification.

(Lecture 08)

Unit - V

Unsupervised Learning & Clustering: Criterion functions for clustering, Clustering Techniques: Iterative square - error partitional clustering – K means, agglomerative hierarchical clustering, Cluster validation.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Identify, interpret and analyze stakeholder needs.
2. Identify and apply relevant problem solving methodologies
3. Implement and test solutions
4. Communicate effectively in ways appropriate to the discipline, audience and purpose.
5. Work as an effective member or leader of diverse teams within a multi-level, multi-disciplinary and multi-cultural setting

Reference Books:

1. Richard O. Duda, Peter E. Hart and David G. Stork, "Pattern Classification",
 2. C. M. Bishop, "Pattern Recognition and Machine Learning", Springer, 2009.
 3. S. Theodoridis and K. Koutroumbas, "Pattern Recognition", 4th Edition, Academic Press, 2009.
- Data Mining & Data Warehouse

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII

NEURAL NETWORK

Course Code: ECS712

L	T	P	C
3	0	0	3

Unit-I:

Neuro computing and Neuroscience Historical notes, human Brain, neuron Mode, Knowledge representation, N.N Learning process: Supervised and unsupervised learning, Error correction learning, competitive learning, adaptation.

(Lecture 08)

Unit-II:

Basic Models of Artificial neurons, activation Functions, aggregation function, single neuron computation, multilayer perceptron, least mean square algorithm, gradient descent rule, nonlinearly separable problems in NN.

(Lecture 08)

Unit-III

Multilayered network architecture, back propagation algorithm, heuristics for making BP algorithm performs better, approximation properties of RBF networks and comparison with multilayer perceptron.

(Lecture 08)

Unit-IV

Recurrent network and temporal feed-forward network, implementation with BP, self organizing map and SOM algorithm, properties of feature map and computer simulation. Principal component and Independent component analysis.

(Lecture 08)

Unit-V

Analyticity of activation function, Complexity analysis of network models, Soft computing, Neuro-Fuzzy-genetic algorithm Integration.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Describe basic types of artificial neural networks.
2. Design and implement neuron based system.
3. Designing and working of back propagation algorithm.
4. Understand basic learning algorithms of artificial neural networks.
5. Understand the concept of soft computing and neuro- fuzzy-genetic algorithms and their uses.

Reference Books:

1. J.A. Anderson, An Introduction to Neural Networks, MIT
2. Hagen Demuth Beale, Neural Network Design, Cengage Learning
3. R.L. Harvey, Neural Network Principles, PHI
4. Kosko, Neural Network and Fuzzy Sets, PHI

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII

Industrial Psychology

Course Code: EHM703

L	T	P	C
3	0	0	3

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.

(Lecture 08)

Unit II

Work and Social change: Nature of modern societies, emergence of industrial capitalism, Technology & Social change, the information society after the industrial society, post-modernity, globalization & Convergence, Significance of the service sector today, work restructuring and corporate management.

(Lecture 08)

Unit III

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

(Lecture 08)

Unit IV

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.

(Lecture 08)

Unit V

Ethical Leadership: Decision making, corporate culture and reputation management, corporate social responsibility and social reporting.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to understand:

1. Concept of Sociology, social structure, social values and its impact on business
2. Work and Social change: modern societies, industrial capitalism, globalization, service sector
3. Work experience in Industry: Technology & work experience, Social background, Stress & anxiety of workers
4. Ethics and the professions, Significance of professional Ethics for Engineers, Applied Ethics
5. Significance of Ethical Leadership, corporate culture and reputation management, corporate social responsibility

Text Books:

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

4. Schinzinger, Roland & Mike W. Martin, *Introduction to Engineering Ethics*- Boston, McGraw Hill.

Reference Books:

1. Fleddermann Charles, *Engineering Ethics*, Upper Saddle River- N.J. Prentice Hall.
2. Miller & Form, *Industrial Sociology*, London Harper & Row.
3. Parsons Richard D., *The Ethics of Professional Practice*-Allyn& Bacon, London.
4. Govindarajan- *Engineering Ethics*- Prentice Hall (India) New Delhi.
Bhatia S.K. - *Business Ethics & Management Values*- Deep & Deep Publication. N. Delhi

*Latest editions of all the suggested books are recommended.

NATURAL LANGUAGE PROCESSING

Course Code: ECS706

L	T	P	C
3	0	0	3

Objective:

This introductory course gives an overview of many concepts, techniques, and algorithms in machine learning, beginning with topics such as classification and linear regression and ending up with more recent topics such as boosting, support vector machines, hidden Markov models, and Bayesian networks. The course will give the student the basic ideas and intuition behind modern machine learning methods as well as a bit more formal understanding of how, why, and when they work. The underlying theme in the course is statistical inference as it provides the foundation for most of the methods covered.

Course Contents

Unit I

Introduction: Machine learning problems, Types of learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised Learning: Vapnik-Chervonenkis (VC) Dimension, Probably Approximately Correct (PAC) Learning, Noise, Learning Multiple Classes, Regression, Model Selection and Generalization. **(Lecture 08)**

Unit II

Bayesian Decision Theory: Classification, Losses and Risks, Association Rules, **Dimensionality Reduction:** Subset Selection, Principal Components Analysis, Multidimensional Scaling, Linear Discriminant Analysis. **(Lecture 08)**

Unit III

Clustering: Mixture Densities, k-Means Clustering, Expectation-Maximization Algorithm, Supervised Learning after Clustering, Hierarchical Clustering, **Classification:** Decision Trees, Univariate Trees, Pruning, Rule Extraction from Trees, Learning Rules from Data. **(Lecture 08)**

Unit IV

Artificial Neural Networks: Introduction, neural network representation, perceptrons, multilayer networks and backpropagation algorithm. **(Lecture 08)**

Unit V

Local Models: Introduction, Competitive Learning, Radial Basis Functions, Incorporating Rule-Based Knowledge, Normalized Basis Functions, Competitive Basis Functions, Learning Vector Quantization, Hierarchical Mixture of Experts. **(Lecture 08)**

Course Outcome:

On completion of the course students will be expected to:

1. Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.

Text Books:

1. Ethem Alpaydin, "Introduction to Machine Learning" 2nd Edition, The MIT Press, 2010.
2. Tom M. Mitchell, "Machine Learning", First Edition by Tata McGraw-Hill Education, 2013.
3. Mevin P. Murphy, "Machine Learning: A Probabilistic Perspective" by The MIT

Press,2012.

Reference Books:

1. Christopher M. Bishop, "Pattern Recognition and Machine Learning" by Springer, 2007.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII
DATA COMPRESSION

Course Code: ECS713

L	T	P	C
3	1	0	4

Objective:

Data compression is often referred to as coding, where coding is a very general term encompassing any special representation of data which satisfies a given need. Information theory is defined to be the study of efficient coding and its consequences, in the form of speed of transmission and probability of error. Data compression may be viewed as a branch of information theory in which the primary objective is to minimize the amount of data to be transmitted. The purpose of this paper is analyzing a variety of data compression algorithms.

CourseContents:

Unit - I:

Introduction Compression Techniques: Loss less compression, Lossy Compression, Measures of performance, Modeling and coding, Mathematical Preliminaries for Lossless compression: A brief introduction to information theory, Models: Physical models, Probability models, Markov models, composite source model, Coding: uniquely decodable codes, Prefix codes.

(Lecture 08)

Unit – II:

Huffman coding The Huffman coding algorithm: Minimum variance Huffman codes, Adaptive Huffman coding: Update procedure, Encoding procedure, Decoding procedure. Golomb codes, Rice codes, Tunstall codes, Applications of Hoffman coding: Loss less image compression, Text compression, Audio Compression.

(Lecture 08)

Unit-III:

Arithmetic Coding a sequence, Generating a binary code, Comparison of Binary and Huffman coding, Applications: Bi-level image compression-The JBIG standard, JBIG2, Image compression. Dictionary Techniques: Introduction, Static Dictionary: Diagram Coding, Adaptive Dictionary. The LZ77 Approach, The LZ78 Approach, Applications: File Compression-UNIX compress, Image Compression: The Graphics Interchange Format (GIF), Compression over Modems: V.42 bits, Predictive Coding: Prediction with Partial match (ppm): The basic algorithm, The ESCAPE SYMBOL, length of context, The Exclusion Principle, The BurrowsWheeler Transform: Move-to-front coding, CALIC, JPEG-LS, Multi-resolution Approaches, Facsimile Encoding, Dynamic Markov Compression.

(Lecture 08)

Unit – IV:

Mathematical Preliminaries for Lossy Coding Distortion criteria, Models, Scalar Quantization: The Quantization problem, Uniform Quantizer, Adaptive Quantization, Non uniform Quantization.

(Lecture 08)

Unit-V:

Vector Quantization Advantages of Vector Quantization over Scalar Quantization, The Linde-BuzoGray Algorithm, Tree structured Vector Quantizer. Structured VectorQuantizer.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Broad knowledge of compression techniques as well as the mathematical foundations of data compression.
2. Factual knowledge about existing compression standards or commonly-used compression utilities.
3. Understanding of the ubiquity and importance of compression technologies in today's environment.
4. Elementary understanding of the need for modeling data.

Text Books:

1. Khalid Sayood, Introduction to Data Compression, Morgan Kaufmann Publishers

Reference Books:

1. Rafael C. Gonzalez and Richard E. Woods: Digital Image Processing, Addison-Wesley.
2. Gilbert Held: Data and Image Compression, John Wiley & Sons Ltd.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII SIMULATION AND MODELING

Course Code: ECS708

L	T	P	C
3	1	0	4

Objective:

To study the simulation techniques to predict the performance of system by providing historical data with the use of computers.

Course

Contents Unit I

Systems and Models: System definition and components; Stochastic activities; Continuous and Discrete systems; System modeling; Types of Models: Static and Dynamic physical, Static and Dynamic mathematical, Full corporate.

(Lecture 08)

Unit II

System Simulation: Why and when to simulate; Basic nature; Techniques; Comparison of simulation and analytical methods; Types of system simulation: Real time, Hybrid, Monte-Carlo; Pure-pursuit problem; Single-server queuing system and inventory problem; Distributed lag, Cobweb.

(Lecture 08)

Unit III

Applications of Simulation: 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; Monte-Carlo computation vs. Stochastic simulation.

Random Number: Generation; Test; Generalization of non-uniformly distribution numbers.

(Lecture 08)

Unit IV

Models: System dynamics: Exponential decay, Exponential growth, Modified Exponential growth, Generalization of Exponential growth; System dynamics diagrams: Logistic curves; Feedback in socio-economic systems; World model.

(Lecture 08)

Unit V

Simulation Languages: Continuous and discrete simulation languages; Expression based languages;

Packages: Object-oriented simulation; General-purpose vs. Application-oriented simulation; CSMP-III, MODSIM-III; Simulation of pert networks; Critical path computation; Uncertainties in activity duration; Resource allocation and consideration; Simulation software.

(Lecture 08)

Course Outcome:

1. Ability of Knowledge based problem formulation
2. Defining the system
3. Ability of model translation
4. Ability of verification, validation
5. Ability of experimental design
6. Ability of analysis

Text Books:

1. Geoffrey, G., *System Simulation*, Prentice Hall of India.
2. Narsingh, D., *System Simulation with Digital Computer*, Prentice Hall of India.
3. Kelton, W.D., *Simulation Modeling and Analysis*, Tata McGraw Hill.

Reference Book:

1. Banks, C., *Discrete Event System Simulation*, Prentice Hall of India.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII
CLOUD COMPUTING

Course Code: ECS709

L	T	P	C
3	1	0	4

Objective:

To understand the Cloud Environment.

CourseContents

Unit I

Cloud Computing: Existing usage of cloud computing; New paradigm in the cloud; Applications.

Cloud Computing Architectural Framework: Cloud: Benefits, Vocabulary, Business scenarios, Essential characteristics, Deployment models, Service models, Multi-tenancy, Approaches to create a barrier between the tenants.

(Lecture 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; Problem of metering Cloud broker.

(Lecture 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.

(Lecture 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.

(Lecture 08)

Unit V

Case Studies on Cloud Computing Applications: Amazon's cloud services (AWS); Windows Azure; Cloud software for private banking.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Understand various basic concepts related to cloud computing technologies
2. Understand the architecture and concept of different cloud models: IaaS, PaaS, SaaS
3. Understand the underlying principle of cloud virtualization.
4. Understand different cloud programming platforms .
5. Be familiar with application development and deployment using cloud platforms
6. Basic understanding of Cloud Reliability, Fault Tolerance and Response Time
7. Vendor Lock-in and Efforts at Standardization
8. Cloud Economics and Capacity Management
9. Case studies on cloud platforms such as Amazon's cloud services (AWS); Windows Azure; Cloud software for private banking.

Text Books:

1. David, E.Y. Sarna, *Implementing and Developing Cloud Computing Applications*, CRC Press.
2. Dimitris, N. Chorafas, *Cloud Computing Strategies*, CRC Press.

Reference Books:

1. Mather, T., *Cloud Security and Privacy: An Enterprise Perspective On Risks And Compliance*, O'Reilly.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII Python

Course code: ECS 714

L- 3, T-1, P-0, C-4

Objective: Python is a useful scripting language for developers and describes how to design and program Python applications. To learn how to use lists, tuples, and dictionaries in Python programs. It also define structure and components of a Python program. To learn how to write loops and decision statements in Python.

Course Content

Unit - I

Introduction History, Features, Setting up path, Working with Python, Basic Syntax ,Variable and Data Types , Operator Conditional Statements If ,If- else ,Nested if-else Looping For, While ,Nested loops Control Statements Break, Continue ,Pass **(Lecture 08)**

Unit - II

String Manipulation Accessing Strings ,Basic Operations ,String slices ,Function and Methods Lists Introduction ,Accessing list ,Operations ,Working with lists ,Function and Methods Tuple Introduction ,Accessing tuples ,Operations ,Working ,Functions and Methods**(Lecture 08)**

Unit - III

Dictionaries Introduction,Accessing values in dictionaries, Working with dictionaries, Properties ,Functions Functions Defining a function , Calling a function, Types of functions ,Function Arguments ,Anonymous functions ,Global and local variables

(Lecture 08)

Unit - IV

Modules Importing module ,Math module ,Random module ,Packages ,Composition Input-Output Printing on screen ,Reading data from keyboard ,Opening and closing file ,Reading and writing files ,Functions **(Lecture 08)**

Unit - V

Exception Handling Exception ,Exception Handling ,Except clause ,Try ? finally clause ,User Defined Exceptions

OOPs concept Class and object , Attributes ,Inheritance ,Overloading ,Overriding ,Data hiding **(Lecture 08)**

Course Outcome

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

1. To understand why Python is a useful scripting language for developers..
2. To learn how to use lists, tuples, and dictionaries in Python programs.
3. To learn how to use indexing and slicing to access data in Python programs.
4. To define the structure and components of a Python program.
5. To learn how to write loops and decision statements in Python.
6. To learn how to write functions and pass arguments in Python.
7. To learn how to build and package Python modules for reusability.
8. To learn how to read and write files in Python.
9. To learn how to design object-oriented programs with Python classes.

Text Books

1. Learning Python by Mark Lutz, David Ascher Shop O'Reilly - O'Reilly Media
2. Beginning Python Magnus Lie Hetland , [Goodreads](#)
3. Python Programming for the Absolute Beginner third edition Ross Dawson [Goodreads](#)

Reference Books

1. Learn Python the Hard Way, Zed A. Shaw , [Goodreads](#)
2. Python Essential Reference, David M. Beazley, Addison Wesley

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII

INDUSTRIAL TRAINING & PRESENTATION

Course Code: ECS791

L	T	P	C
0	0	0	4

Students will have to undergo industrial training of eight 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 Principal 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 student's 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.

Course Outcome:

1. After completion of this course students will gain industrial experience of developing software or web based applications to solve real time problems of customers.

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

B.Tech (CSE) Semester VII

PROJECT WORK PHASE- 1 **(Synopsis, Literature Survey & Presentation)**

Course Code: ECS799

L	T	P	C
0	0	8	4

A group of students, not more than three, will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified in the starting of the VII semester.

The group will carry out the literature search and collect required material for carrying out the project.

The group will prepare a report not exceeding 15 pages at the end of semester.

The assessment of performance of students should be made at least twice in each semester i.e. VII and VIII. In this semester the student shall present the progress of 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 Principal.

Course Outcome:

1. After completion of this course, students will be able to Understand how to prepare Synopsis , SRS Document.
2. Student should be able to describe the project functions and modules in detail.

The marking shall be as follows.

Internal: 50 Marks

By The Faculty Guide - 50 Marks

By Committee Appointed By the Director – 50 Marks

External: 50 Marks

By External Examiner Appointed By the University – 50 Marks

Semester VII
DISCIPLINE & GENERAL PROFICIENCY

Course Code: EGP711

L T PC

1 0 0 1

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

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

The above is 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).

Head of Department would be display GP marks on notice board in prescribed format after IInd & IIIrd CT in semester:

S N o	Enroll No.	Student Name	Dress code	Participation in Conferences /Workshops / Seminars	Participation in guest lectures, invited talks and special technical sessions	Participation in community Services	Participation in Culture & extra curriculum activities, Department Club Activities	Participation in sports/ co- curricular activities	General Behavior	Any Extra Achievement
			(5)	(15)	(20)	(10)	(20)	(20)	(5)	(5)
Responsible for marks			Mentor	Head	Head	Mentor	Cultural Events Coordinator & Department Club Coordinator	Sports Coordinator	Mentor	Director or Principal

DATA WAREHOUSING AND DATA MINING

Course Code: ECS801

L	T	P	C
3	1	0	4

Objective:

Data warehouse is used to manage the old data and mining is used for finding the appropriate information for decision making. The course provides knowledge of Data warehousing and Data mining.

Course Contents

Unit I

Data Warehousing: Understanding data warehouse, features of data warehouse, integrating heterogeneous databases, comparison of data warehouse and operational data, benefits of data warehousing, problems of data warehousing, data warehouse applications, data warehouse types, types of data stored in a data warehouse, extract transform load.

(Lecture 08)

Unit II

Dimensional Modeling: Dimensional tables, Fact tables, STAR Schema, Characteristics of Star Schema, Keys; Advantages. Updates to the Dimension tables; miscellaneous dimensions. Snowflake schema, Advantage of Snowflake Schema, Aggregate fact tables; Families of STARS, fact constellation.

(Lecture 08)

Unit III

Data Warehousing Architecture: Operational Data, Store, Detailed, Lightly and Highly summarized, Meta-Data; Archive/Backup; Manager: Load, Warehouse, Query; Architecture models: 2-Tier, 3-Tier and 4-Tier, data warehouse design approaches, data warehouse models.

(Lecture 08)

Unit IV

OLAP: Definitions, Codd's Rules, Characteristics, Features and functions, Olap system components, Dimensional analysis; Hypercubes; Drill-Down and Roll-Up; Slice-and-Dice or Rotation; OLAP Models.

(Lecture 08)

Unit V

Data Mining: Definition; Knowledge discovery process (KDP); Applications of data mining, architecture of a typical data mining system, types of data mining system

Major data mining techniques; Cluster detection, Decision trees; Memory-based reasoning; Link analysis; Neural networks; Genetic algorithms; Applications; Benefits.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Have deeper understanding of database systems and their underlying theory to be able to
2. Improve decision making process.
3. Understand the concept of designing of data warehouses.
4. Be able to design the physical model of data warehouse.
5. Identify Online Analytical Processing (OLAP) databases.

6. Understand data mining concepts and techniques.

Text Books

1. Paul R. P., *Fundamentals Of Data Warehousing*, John Wiley and Sons.
2. Inmon W. H., *Building the Operational Data Store*, John Wiley and Sons.

Reference Books

1. Anahony S., *Data Warehousing In the Real World: A Practical Guide for Building DecisionSupport Systems*, John Wiley and Sons.
2. Kamber and Han, "Data Mining Concepts and Techniques", Hartcourt India P. Ltd.,

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VIII
DISTRIBUTED SYSTEM

Course Code: ECS805

L	T	P	C
3	1	0	4

Objective: understand the concept of Distributed System, organization of Distributed System, advantages and limitations of Distributed System, Scale as the number of entities in the system increase. Can sustain failures and recover from them, Work with distributed, fault tolerant file systems, Can handle and process large data volumes, Are secure and handle certain classes of distributed denial of service attacks, Are Loosely coupled, transactional and eventually stable.

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 and vectors logical clocks, Causal ordering of messages, global state, termination detection. Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms. **(Lecture 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. **(Lecture 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, Recent advances. **(Lecture 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. **(Lecture 08)**

Unit -V Distributed Algorithms: Introduction to communication protocols, Balanced sliding window protocol, Routing algorithms, Destination based routing, APP problem, Deadlock free Packet switching,

Course Outcome:

After completion of the course the students shall be able to understand :

1. Basics of Distributed Operating System concepts like scheduling and logical clocks.
2. Deadlock handling in distributed environment along with agreement and commit protocols.
3. Knowledge of RMI, RPC and file system.
4. Transaction processing in distributed systems.

Text Books:

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

Reference Books

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

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VIII Android Programming

Course Code: ECS806

L	T	P	C
3	1	0	4

Objective: The objective of this course module is to provide the sound knowledge of Android Development. It helps the students to develop various apps using Android for different types of mobile devices and tablets.

Course Contents

Unit - I

Overview: What is Android, Features of Android, Setting up Android Environment, Android Architecture, Application Framework. Application components (activities, services, Broadcast receivers, content providers). First sample application, Anatomy of Android application, Main activity file, Manifest file, Strings file, R file, Layout file, Running the application.

(Lecture 08)

Unit - II

Emulator-Android Virtual Device, Organizing and accessing the resources, Fragments, Intents & Filters, Basic UI Design, Form widgets, Text Fields, UI Controls, UI Layouts.

(Lecture 08)

Unit - III

Event Handling: Event Listeners and Handlers, Event Listeners Registration. Preferences, Menus, Custom Components, Tabs and Tab Activity

(Lecture 08)

Unit – IV

Styles and Themes, Drag and Drop, Content Provider (SQLite Programming, SQLiteOpenHelper, SQLiteDatabase, Cursors).

(Lecture 08)

Unit - V

Location Based Services, Sending Emails, Sending SMS

(Lecture 08)

Course Outcome

After completion of this course students will have understanding of:

1. Android Framework for Application Development
2. Emulators to be used
3. Event handling in android
4. Basics of styles and themes in Android

Text Books:

1. Carmen Delessio., *Sams Teach Yourself Android Application Development in 24 Hours*, SAMS
2. Reto Meier, Wrox *Professional Android Application Development*, Paperback

Reference Books:

1. Jonathan Simon, *Head First Android Development*, O'Reilly

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VIII
Concepts of IoT (Internet of Things)

Course Code: ECS807

L	T	P	C
3	1	0	4

Objective: The course aims to introduce students to the concepts underlying the Internet of Things (IoT) through a series of lectures on the various topics that are important to understand the state-of-the-art as well as the trends for IoT. In order to pass the course, the students should be able to:

Course Contents

Unit I

Introduction to Internet in general and Internet of Things: Introduction to Internet: layers, protocols, packets, services; Local Area Networks, MAC level, link protocols such as: point-to-point protocols, Ethernet, WiFi 802.11, cellular Internet access, and Machine-to-Machine (M2M). **(Lecture 08)**

Unit II

IoT Technology Fundamentals: IoT definitions: overview, applications, potential & challenges, and architecture; Devices and gateways, Local and wide area networking; Data management, Business processes in IoT, Everything as a Service(XaaS), IoT Analytics, Knowledge Management. **(Lecture 08)**

Unit III

IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. IoT examples: Case studies, e.g. sensor body-area-network and control of a smart home. **(Lecture 08)**

Unit IV

IoT Architecture-State of the Art – Introduction, State of the art, **Architecture Reference Model-** Introduction, Reference Model and architecture, IoT reference Model; IoT Reference Architecture: Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. **(Lecture 08)**

Unit V

Real-World Design Constraints- Introduction, Technical Design constraints, Data representation and visualization, Interaction and remote control. Uses of IoT in Industrial Automation, Commercial Building Automation, Wireless communication, etc. **(Lecture 08)**

Course Outcomes:

After the successful completion of the course the student will be able to:

1. Describe the concept of IoT, its fundamentals
2. Describe IoT architecture, and protocols
3. Conceptually describe countermeasures for Internet of Things devices
4. Compare and contrast the threat environment based on industry and/or device type.
5. Contrast the constraints of real world design.

Textbook:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, **“From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”**, 1st Edition, Academic Press, 2014.

Reference Books:

1. Vijay Madisetti and Arshdeep Bahga, **“Internet of Things (A Hands-on-Approach)”**, 1st Edition, VPT, 2014.
2. Francis daCosta, **“Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”**, 1st Edition, Apress Publications, 2013

*Latest editions of all the suggested books are recommended.

DIGITAL IMAGE PROCESSING

Course Code: ECS803

L	T	P	C
3	1	0	4

Objective:

- To gain the knowledge of digital image processing which includes topics like image enhancement, restoration, compression, 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.

(Lecture 08)

Unit II

Image Enhancement: Spatial domain methods: Point processing, Intensity transformations, histogram processing; Image subtraction and averaging; Spatial filtering: Smoothing, Sharpening, Frequency domain methods; Filtering: Low pass, High pass filtering, Homomorphic filtering; Generation of spatial masks from frequency domain specifications.

(Lecture 08)

Unit III

Image Restoration: Degradation model; Diagonalization of circulant and block Circulant matrices; Algebraic approaches: Inverse filtering, Wiener filtering, Constrained least squares restoration, Interactive restoration, Geometric transformations; Fundamentals of color image processing: Color models; RGB, CMY, YIQ, HIS; pseudo color image processing, intensity slicing, Gray level to color transformation.

(Lecture 08)

Unit IV

Image Compression: Redundancy: Coding, Inter Pixel, Psycho Visual; Fidelity criteria; Models; Elements of information theory; Error free compression: Variable length, Bit plane, Lossless predictive, Lossy compression, Lossy predictive, Transform coding. JPEG, MPEG, fractals.

(Lecture 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; Representation and description.

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. To study the image fundamentals and mathematical transforms necessary for image processing.
2. To study the image enhancement techniques
3. To study image restoration procedures.
4. To study the image compression procedures.
5. To study the image segmentation and representation techniques.

Text Books

1. Gonzalez R. C., Woods R. E., *Digital Image Processing*, Pearson Education.

2. Jain A. K., *Fundamentals Of Digital Image Processing*, Pearson Education.

Reference Books

1. Pratt W. K., *Digital Image Processing*, John Wiley and Sons.

2. Boyle R., Sonka M., Hlavac V., *Image Processing, Analysis And Machine Vision*, Vikas Publishing House.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VIII
MANAGEMENT INFORMATION SYSTEM

Course Code: ECS804

L	T	P	C
3	1	0	4

Objective:

- To provide the knowledge of Information Systems in Business.

Unit I

Foundation of Information Systems: Introduction; Solving Business Problems with Information Systems; Types; Effectiveness and Efficiency Criteria; Management Information Systems: Structure, MIS vs. Data Processing, MIS vs. Decision Support Systems, MIS vs. Information Resources Management; End-user Computing.

(Lecture 08)

Unit II

System Analysis and Design: Functions; CASE Tools; Project Feasibility; Information requirement and Decision analysis; Preparing system proposal; Input/output Design; Procedures and Control Design; System development: Testing and Quality Assurance (QA).

(Lecture 08)

Unit III

Concepts of Planning and Control: Planning: Organizational planning, Planning process, Computational support for Planning; Characteristics of Control process; Nature of Control in an Organization.

(Lecture 08)

Unit IV

Business Applications of Information Technology: Internet and Electronic commerce; Intranet, Extranet and Enterprise solutions; Information system for Business operations and Managerial decision support; Strategic advantages.

(Lecture 08)

Unit V

Managing Information Technology: Enterprise and Global management; Security and Ethical challenges; Planning and implementing changes; Information systems; Enterprise resource planning; Supply chain management; Customer relationship management and Procurement management

(Lecture 08)

Course Outcome:

After completion of the course the students shall be able to:

1. Acquire knowledge of the functional areas of business and the interrelationships among the functional areas within a business.
2. Acquire Knowledge of various quality measure tools.
3. Acquire knowledge of the SCM. CRM and Procurement Management.
4. Understand Strategic planning and its advantages.

Text Books

1. Brian, O, *Management Information System*, Tata McGraw Hill.
2. Gordon, B. D. and Margrethe H. O., *Management Information System*, Tata McGraw Hill.

Reference Books

1. Brian, O., *Introduction to Information System*, McGraw Hill.

2. Jawadekar, W., *Management Information System*, Tata McGraw Hill.
3. Jain, S., *Management Information System*, Tata McGraw Hill.

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VIII

R-PROGRAMMING

Course Code: ECS808

L	T	P	C
3	1	0	4

Objective:

- To provide the knowledge of programming in R and how to use R for effective data analysis.

Unit I

History and Overview of R: Introduction to R, The S Philosophy, Basic Features of R, Free Software Design of the R, System Limitations of R, R Resources, Installation and getting started with the R interface. **(Lecture 08)**

Unit II

R Nuts and Bolts : Entering Input, Evaluation, R Objects, Numbers, Attributes, Creating Vectors, Mixing Objects, Explicit Coercion, Matrices, Lists, Factors, Missing Values, Data Frames, Names, Reading and Writing Data, Reading Data Files with read.table(). **(Lecture 08)**

Unit III

Control Structures and Functions and Loop Functions: Control Structures, if-else, for Loops, Nested for loops, while Loops, repeat Loops, next, break, Functions in R, Argument Matching, Lazy Evaluation, The ... Argument, Arguments Coming After the ... Argument, Looping on the Command Line, lapply(), sapply(), split(), Splitting a Data Frame, tapply, apply(), Col/Row Sums and Means, Other Ways to Apply, mapply(), Vectorizing a Function. **(Lecture 08)**

Unit IV

Data Manipulation (dplyr, reshape2 packages) and Scoping Rules of R: Data Frames, The dplyr Package, dplyr Grammar, Installing the dplyr package, select(), filter(), arrange(), rename(), mutate(), group_by(), A Diversion on Binding Values to Symbol, Scoping Rules, Lexical Scoping: Why Does It Matter?, Lexical vs. Dynamic Scoping, Application: Optimization. **(Lecture 08)**

Unit V

Debugging, Profiling R Code and Simulation: Figuring Out What's Wrong, Debugging Tools in R, Using traceback(), Using debug(), Using recover(), Using system.time(), Timing Longer Expressions, The R Profiler, Using summaryRprof(), Generating Random Numbers, Setting the random number seed, Simulating a Linear Model, Random Sampling. **(Lecture 08)**

Course Outcome:

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

1. To understand why R-Programming is a useful language for developers.
2. To define the structure and components of an R-Programming program.
3. To learn how to write loops and decision statements in R-Programming.
4. To learn how to write functions and pass arguments in R-Programming.

5. To learn how to read and write files in R-Programming.

Text Book

R Programming for Data Science, by Roger D. Peng Using R for Introductory Statistics, by John Verzani, Chapman & Hall/CRC, 2004, ISBN 1584884509 Advanced R, by Hadley Wickham, ISBN 9781466586963.

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B.Tech (CSE) Semester VIII
DIGITAL IMAGE PROCESSING (LAB)

Course Code: ECS852

	L	T	P	C
0		0	4	2

LIST OF EXPERIMENTS

1. To Write Program To Implement The Spatial Image Enhancement Functions On A Bitmap Image –
 - (a) Mirroring (Inversion)
 - (b) Rotation (Clockwise)
 - (c) Enlargement (Double Size)
2. To Write Program To Implement
 - (a) Low Pass Filter
 - (b) High Pass Filter
3. To Write Program To Implement
 - (a) Arithmetic Mean Filter
 - (b) Geometric Mean Filter
4. To Write Program To Implement Smoothing And Sharpening Of An Eight Bit Color Image
5. To Write Program To Implement
 - (a) Boundary Extraction Algorithm
 - (b) Graham's Scan Algorithm
6. To Write Program To Implement
 - (a) Edge Detection
 - (b) Line Detection

Course Outcome:

After completion of the course the students shall be able to:

1. Describe how digital images are represented and stored efficiently depending on the desired quality, color depth, dynamics (time-varying data)

B.Tech (CSE) Semester VIII
MANAGEMENT INFORMATION SYSTEM (LAB)

CourseCode: ECS853

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.

Course Outcome:

After completion of the course the students shall be able to:

2. Understand and apply core knowledge of programming, networking, databases, and system design.
3. Analyze, gather requirements, and design systems.
4. Develop, control, and manage projects.

B.Tech (CSE) Semester VIII

DATA WAREHOUSING AND DATA MINING (LAB)

Course Code: ECS851

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

1. To develop an application to implement defining subject area, design of fact dimension table, data mart.
2. To develop an application to implement OLAP, roll up, drill down, slice and dice operations.
3. To develop an application to construct a multidimensional data.
4. To develop an application to implement data generalization and summarization technique.
5. To develop an application to extract association rule of data mining.
6. To develop an application for classification of data.
7. To develop an application for one clustering technique
8. To develop an application for Naïve Baye's classifier.
9. To develop an application for decision tree.

Course Outcome:

The practical of this subject should be provided in such a manner that it gives students hands on:

1. Modeling and design of data warehouses.
2. Install and Configure WEKA Tool
3. Demonstrate WEKA Explorer, Mining techniques and Attribute Relation File
4. Format (ARFF).
5. Compare various Data Mining techniques available in WEKA

B.Tech (CSE) Semester VIII
ANDROID PROGRAMMING (LAB)

CourseCode: ECS854

L	T	P	C
0	0	4	2

List of Experiments

1. Creating Applications with Multiple Activities and a Simple Menu using ListView
2. Creating Activities For Menu Items and Parsing XML Files
3. Writing Multi-Threaded Applications
4. Using WebView and Using the Network
5. Graphics Support in Android
6. Preferences and Content Providers
7. Location Services and Google Maps in Android

Course Outcome:

After completion of the course the students shall be able to:

1. Have Knowledge of Android applications.
2. Design and develop mobile application

B.Tech (CSE) Semester VIII PROJECT WORK PHASE-2

Course Code: ECS899

L	T	P	C
0	0	16	8

Students should devote themselves to prepare something tangible, which could be a working model of their thoughts based on their subject of choice.

The project shall be finalized by the students based on the VII semester project work report 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. In this semester 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 Principal.

Course Outcome:

1. After completion of this course, students will be able to develop Window, Web based or Mobile based applications to specific set of problem and their solutions.

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: EGP811

L T PC

1 0 0 1

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

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

The above is 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).

Head of Department would be display GP marks on notice board in prescribed format after IInd & IIIrd CT in semester:

S N o	Enroll No.	Student Name	Dress code	Participation in Conferences /Workshops / Seminars	Participation in guest lectures, invited talks and special technical sessions	Participation in community Services	Participation in Culture & extra curriculum activities, Department Club Activities	Participation in sports/ co- curricular activities	General Behavior	Any Extra Achievement
			(5)	(15)	(20)	(10)	(20)	(20)	(5)	(5)
Responsible for marks			Mentor	Head	Head	Mentor	Cultural Events Coordinator & Department Club Coordinator	Sports Coordinator	Mentor	Director or Principal