Study &Evaluation Scheme

Bachelor of Technology
(Computer Science & Engineering)

[Applicable w.e.f Academic Session 2016-17till revised]

COLLEGE OF COMPUTING SCIENCES & INFORMATION TECHNOLOGY

TEERTHANKER MAHAVEER UNIVERSITY

Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in

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TEERTHANKER MAHAVEER UNIVERSITY

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

Delhi Road, Bagarpur, Moradabad (U.P)

Study & Evaluation Scheme

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 : 202

Minimum credit required for the degree : 192

Assessment Theory :

Internal	External	Total
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
3 hrs.	1 ½ hrs

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)

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)

Program Outcomes (POs)

PO – 1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO – 2	**Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO – 3	**Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO – 4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems.
PO – 5	**Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO – 6	**The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO – 7	**Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO – 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO – 9	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO – 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO – 11	**Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage

	projects and in multidisciplinary environments.
PO – 12	**Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Program-Specific Outcomes (PSOs)

PSO – 1	Developing skills for creating computational solutions with emerging technologies, programming languages, mathematical foundations, algorithmic principles and open source platforms to solve complex engineering problems.
PSO – 2	Understanding the evolutionary changes in computing by applying standard practices and skills acquired through computer engineering to provide solutions with innovative ideas and interdisciplinary research.
PSO – 3	Applying modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur and pursue higher studies in their respective domains.

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

Semester I

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EAS111	Engineering Mathematics - I	3	2	-	4	40	60	100
2	EAS112/212	Engineering Physics	3	2	-	4	40	60	100
	EAS113/213	Engineering Chemistry							
3	EEE111/211	Basic Electrical Engineering	3	2	-	4	40	60	100
	EEC111/211	Basic Electronics Engineering							
4	EAS114	Environmental Science	3	-	-	3	40	60	100
5	EHM 149	Foundation English - I	4	-	2	5	40	**30-Written 30-Viva**	100
6	EAS162/262	Engineering Physics Lab		-	2	1	50	50	100
	EAS163/263	Engineering Chemistry Lab							
7	EEE161/261	Basic Electrical Engineering Lab	-	-	2	1	50	50	100
	EEC161/261	Basic Electronics Engineering Lab							
8	EME161/261	Engineering Drawing Lab							
	EME162/262	Workshop Practice Lab	-	-	4	2	50	50	100
		Total	**16**	**6**	**10**	**24**	**350**	**450**	**800**

Semester II

S. no.	Course Code	Subject	Periods			Credit	EvaluationScheme		
			L	T	P		Internal	External	Total
1	EAS211	Engineering Mathematics-II	3	2	-	4	40	60	100
2	EAS112/212 EAS113/213	Engineering Physics Engineering Chemistry	3	2	-	4	40	60	100
3	EEE111/211 EEC111/211	Basic Electrical Engineering Basic Electronics Engineering	3	2	-	4	40	60	100
4	ECS211	Computer Basics & C Programming	3	-	-	3	40	60	100
5	EHM 299	Language Lab I	-	-	4	2	50	50	100
6	EAS162/262 EAS163/263	Engineering Physics Lab Engineering Chemistry Lab	-	-	2	1	50	50	100
7	EEE161/261 EEC161/261	Basic Electrical Engineering Lab Basic Electronics Engineering Lab	-	-	2	1	50	50	100
8	ECS261	Computer Basics & C Programming Lab	-	-	2	1	50	50	100
9	EME161/261 EME162/262	Engineering Drawing Lab Workshop Practice Lab		-	4	2	50	50	100
		Total	**12**	**6**	**14**	**22**	**410**	**490**	**900**

Semester III

S. No.	*Course Code*	*Subject*	*Periods*			*Credit*	*Evaluation Scheme*		
			L	*T*	*P*		*Internal*	*External*	*Total*
1	ECS301	Discrete Structure	3	1	0	3.5	40	60	100
2	ECS305	Data Structure using C	3	1	0	3.5	40	60	100
3	ECS306	Data Base Management System	3	1	0	3.5	40	60	100
4	EEC302	Digital Electronics &Computer Organization	3	1	0	3.5	40	60	100
5	EAS 301	Mathematics-III	3	1	0	3.5	40	60	100
6	EHM 302	Organizational Behavior	3	0	0	3	40	60	100
7	ECS355	Data Structure using C (Lab)	0	0	3	1.5	50	50	100
8	ECS356	Data Base Management System (Lab)	0	0	3	1.5	50	50	100
9	EEC 351	Digital Logic Circuit Lab	0	0	3	1.5	50	50	100
10	EHM349	English Communication and Soft Skills-III	**1**	1	2	2	40	**60**	100
		Total	**19**	**06**	**11**	**27**	**430**	**570**	**1000**

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

Semester IV

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	ECS401	Theory of Computation	3	1	0	3.5	40	60	100
2	ECS 403	Object Oriented Programming System	3	1	0	3.5	40	60	100
3	ECS404	Software Engineering	3	1	0	3.5	40	60	100
4	ECS405	Computer Based Numerical & Statistical Techniques	3	1	0	3.5	40	60	100
5	ECS406	Operating System	3	1	0	3.5	40	60	100
6	EAS403	Human Values & professional Ethics	3	1	0	3.5	40	60	100
7	ECS452	C++ Programming (Lab)	0	0	4	2	50	50	100
8	ECS 453	Computer Based Numerical & Statistical Techniques (Lab)	0	0	3	1.5	50	50	100
9	ECS454	UNIX & Shell Programming (Lab)	0	0	3	1.5	50	50	100
10	EHM499	English Communication and Soft Skills-IV	**0**	**0**	**4**	**2**	**50**	**50**	**100**
		Total	**18**	**6**	**14**	**28**	**440**	**560**	**1000**

Semester V

S.NO.	*Course Code*	*Subject*	*Periods*			*Credit*	*Evaluation Scheme*		
			L	*T*	*P*		*Internal*	*External*	*Total*
1	ECS501	Compiler Design and Construction	3	1	0	3.5	40	60	100
2	ECS 502	Computer Architecture	3	1	0	3.5	40	60	100
3	ECS503	Analysis and Design of Algorithm	3	1	0	3.5	40	60	100
4	ECS508	Java Programming	3	1	0	3.5	40	60	100
5	EHM503	Engineering and Managerial Economics	3	1	0	3.5	40	60	100
6	ECS552	Analysis and Design of Algorithm (Lab)	0	0	4	2	50	50	100
7	ECS554	Java Programming (Lab)	0	0	4	2	50	50	100
8	EHM 599	English Communication and Soft Skills – V	1	1	2	2	50	**50**	100
9	ECS591	Industrial Training	0	0	0	2	50	50	100
10	ECS506	ERP System	3	1	0	3.5	40	60	100
	ECS507	Mobile Communication							
	ECS509	Multimedia & Animation							
		Total	**19**	**7**	**10**	**29**	**440**	**560**	**1000**

Semester VI

S.NO.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	ECS601	Artificial Intelligence	3	1	0	3.5	40	60	100
2	ECS603	Computer Graphics	3	1	0	3.5	40	60	100
3	ECS608	Computer Network	3	1	0	3.5	40	60	100
4	EHM 649	English Communication & Soft Skills – VI	1	1	2	2	40	60	100
5	ECS610	Cyber Law & Information Security	3	1	0	3.5	40	60	100
6	ECS 651	Artificial Intelligence (Lab)	0	0	4	2	50	50	100
7	ECS653	Computer Graphics (Lab)	0	0	3	1.5	50	50	100
8	ECS654	Computer Network (Lab)	0	0	4	2	50	50	100
		Elective II – Select any one course from serial no 9 given below							
9	ECS606	Real Time Operating System	3	1	0	3.5	40	60	100
	ECS607	Soft Computing							
	EEC606	Microprocessor & Application							
	ECS609	E-Commerce							
		Total	16	6	**13**	**25**	**400**	**500**	**900**

Semester VII

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	ECS701	Web Technology (Design and Architecture using ·NET)	3	1	0	3.5	40	60	100
2	ECS703	Cryptography and Network Security	3	1	0	3.5	40	60	100
3	ECS704	Software Project Management	3	1	0	3.5	40	60	100
4	ECS751	Web Technology (Design and Architecture using .NET) (Lab)	0	0	4	2	50	50	100
5	ECS752	Cryptography and Network Security (Lab)	0	0	4	2	50	50	100
		Elective III – Select any one course from serial no 6 given below							
6	ECS 711	Pattern Recognition	3	0	0	3	40	60	100
	ECS 712	Neural Network							
	EHM 703	Industrial Psychology							
	ECS706	Natural Language Processing							
		Elective IV – Select any one course from serial no 7 given below							
7	ECS713	Data Compression	3	1	0	3.5	40	60	100
	ECS708	Simulation and Modeling							
	ECS709	Cloud Computing							
8	ECS791	Industrial Training & Presentation	0	0	0	4	50	50	100
9	ECS799	Project Work Phase-1	0	0	4	2	50	50	100
		Total	15	**4**	**12**	**27**	**400**	**500**	**900**

Semester VIII

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	ECS 801	Data Warehousing and Data Mining	3	2	0	4	40	60	100
2	ECS 805	Distributed System	3	2	0	4	40	60	100
3	ECS 851	Data Warehousing and Data Mining (Lab)	0	0	4	2	50	50	100
Elective V – Select any one course from serial no. 4 below									
4	ECS 803	Digital Image Processing	3	2	0	4	40	60	100
	ECS 804	Management Information System							
Elective V - Lab – Same as one selected from column above									
5	ECS 852	Digital Image Processing (Lab)	0	0	4	2	50	50	100
	ECS 853	Management Information System (Lab)							
	ECS 854	Android Programming (Lab)							
6	ECS 899	Project Work Phase-2	0	0	8	4	50	50	100
		Total	**9**	**6**	**16**	**20**	**270**	**330**	**600**

Course Code: EAS116	**B.Tech- Semester-I** **Engineering Mathematics-I**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of eigenvalues and eigenvectors, Optimization & derivatives of functions of several variables, partial and total differentiation, implicit functions.	
CO2.	**Understanding** the concepts of curl and divergence of vector field.	
CO3.	**Understanding** of Green's theorem, Gauss Theorem, and Stokes theorem.	
CO4.	**Applying** the concept of Leibnitz's theorem for successive derivatives.	
CO5.	**Analyzing** the intangibility of a differential equation to find the optimal solution of first order first degree equations.	
CO6.	**Evaluating** the double integration and triple integration using Cartesian, polar co-ordinates and the concept of Jacobian of transformation.	
Course Content:		
Unit-1:	**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.	**8 Hours**
Unit-2:	**Differential Equation--**First order first degree Differential equation: variable separable, Homogeneous method, Linear differential equation method, Exact Differential equation.	**8 Hours**
Unit-3:	**Differential Calculus:** Leibnitz theorem; Partial differentiation; Euler's theorem; Change of variables; Expansion of function of several variables, Jacobians, Error function.	**8 Hours**
Unit-4:	**Multiple Integrals:** Double integral, Triple integral, Beta and Gamma functions; Dirichlet theorem for three variables, Liouville's Extension of Dirichlet theorem.	**8 Hours**
Unit-5:	**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.	**8 Hours**
Text Books:	**1.** Grewal B.S., *Higher Engineering Mathematics*, Khanna Publishers.	
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.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=EGnI8WyYb3o 2. https://www.youtube.com/watch?v=ksS_yOK1vtk&list=PLbRMhDVUMngfIrZCNOyPZwHUU1pP66vQW	

Course Code: EAS112	**B.Tech- Semester-I** **Engineering Physics-I**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the basic concepts of interference, diffraction and polarisation.	
CO2.	**Understanding** the concept of bonding in solids and semiconductors.	
CO3.	**Understanding** the special theory of relativity.	
CO4.	**Applying** special theory of relativity to explain the phenomenon of length contraction, time dilation, mass-energy equivalence etc.	
CO5.	**Applying** the concepts of polarized light by the Brewster's and Malus Law	
Course Content:		
Unit-1:	**Interference of Light:** Introduction, Principle of Superposition, and 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.	**8 Hours**
Unit-2:	**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.	**8 Hours**
Unit-3:	**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.	**8 Hours**
Unit-4:	**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	**8 Hours**

	Semiconductor. **Hall Effect:** Theory, Hall Coefficients and application to determine the sign of charge carrier, Concentration of charge carrier, mobility of charge carriers.	
Unit-5:	**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.	**8 Hours**
Text Books:	1. Elements of Properties of Matter, D. S. Mathur, S. Chand & Co.	
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.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=toGH5BdgRZ4&list=PLD9DDFBDC338226CA 2. https://www.youtube.com/watch?v=CuqsU7B1MtU	

Course Code: EAS162	**B.Tech- Semester-I** **Engineering Physics (Lab)**	**L-0** **T-0** **P-2** **C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** of the operation of various models of optical devices.	
CO2.	**Understanding** types of Semiconductors using Hall experiments.	
CO3.	**Applying** the concept of interference, polarization & dispersion in optical devices through Newton's ring, Laser, polarimeter & spectrometer.	
CO4.	**Applying** the concept of resonance to determine the AC frequency using sonometer & Melde's apparatus.	
CO5.	**Applying** the concept of resolving & dispersive power by a prism.	
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.To determine the Planck's constant using LEDs of different colours.	

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

EXPERIMENT (5 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)	ATTENDANCE (10 MARKS)	EXPERIMENT (5 MARKS)	VIVA (10 MARKS)	INTERNAL (50 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)

Course Code: EAS113	**B.Tech- Semester-I** **Engineering Chemistry**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concept of softening & purification of water.	
CO2.	**Understanding** calorific value& combustion, analysis of coal, Physical & Chemical properties of hydrocarbons & quality improvements.	
CO3.	**Understanding** the concept of lubrication, Properties of Refractory & Manufacturing of cements.	
CO4.	**Applying** the concepts of the mechanism of polymerization reactions, Natural and synthetic rubber& vulcanization.	
CO5.	**Applying** the concepts of spectroscopic & chromatographic techniques.	
Course Content:		
Unit-1:	**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, calgonetc	**8 Hours**
Unit-2:	**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 by product, knocking relationship between knocking and structure and hydrocarbon, improvement ant knocking characteristic IC Engine fuels, Diesel Engine fuels, Cetane Number.	**8 Hours**
Unit-3:	**Lubricants:** Introduction, mechanism of lubrication, classification of	**8 Hours**

	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-4:	**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.	**8 Hours**
Unit-5:	**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.	**8 Hours**
Text Books:	**1.** Agarwal R. K., Engineering Chemistry, Krishna Prakashan.	
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.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=RV-OyRTaIOI 2. https://www.youtube.com/watch?v=phhfkikb6Lw	

Course Code: EAS163	**B.Tech- Semester-I** **Engineering Chemistry (Lab)**	**L-0** **T-0** **P-2** **C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of Hardness of water.	
CO2.	**Analyzing** & estimating of various parameters of water.	
CO3.	**Analyzing** of Calorific value of Solid fuel by Bomb calorimeter & Liquid Fuels by Junkers Gas Calorimeter.	
CO4.	**Analyzing** of open & closed Flash point of oil by Cleveland & Pensky's Martens apparatus.	
CO5.	**Analyzing** of viscosity of lubricating oil using Redwood Viscometer.	
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 O_2, CO_2, % 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)

Course Code: EEE117	**B.Tech-Semester-I** **Basic Electrical Engineering**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the basics of Network, AC Waveform and its characteristics.	
CO2.	**Understanding** the basic concept of Measuring Instruments, Transformers & three phase Power systems.	
CO3.	**Understanding** the basic concepts of Transformer.	
CO4.	**Understanding** the basic concept of power measurement using two wattmeter methods.	
CO5.	**Applying** the concept of Kirchhoff's laws and Network Theorems to analyze complex electrical circuits.	
Course Content:		
Unit-1:	**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.	**8 Hours**
Unit-2:	**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.	**8 Hours**
Unit-3:	**Basics of Measuring Instruments:** Introduction to voltmeter, ammeter, Wattmeter & Energy meter.	**8 Hours**
Unit-4:	**Single phase Transformer:** Principle of operation; Types of construction; Phasor diagram; Equivalent circuit; Efficiency and losses.	**8 Hours**
Unit-5:	**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.	**8 Hours**
Text Books:	**1.** 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.	

	4. Del Toro, Principles of Electrical Engineering, Prentice-Hall International. **5.** W.H. Hayt & J.E. Kemmerly, Engineering Circuit Analysis, McGraw Hill. ***Latest editions of all the suggested books are recommended.**	
Additional electronics reference material:	• https://nptel.ac.in/courses/108/108/108108076/ • https://sites.google.com/tmu.ac.in/dr-garima-goswami/home	

Course Code: EEE161	**B.Tech- Semester-I** **Basic Electrical Engineering (Lab)**	**L-0** **T-0** **P-2** **C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of Kirchoff & Voltage law.	
CO2.	**Understanding** the concepts of dc network theorem.	
CO3.	**Analyzing** the energy by a single-phase energy meter.	
CO4.	**Analyzing** the losses and efficiency of Transformer on different load conditions.	
CO5.	**Analyzing** the electrical circuits using electrical and electronics components on bread board.	
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.

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)

Course Code: EEC111	**B.Tech- Semester-I** **Basic Electronics Engineering**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of electronic components like diode, BJT & FET.	
CO2.	**Understanding** the applications of pn junction diode as clipper, clamper, rectifier & regulator whereas BJT & FET as amplifiers	
CO3.	**Understanding** the functions and applications of operational amplifier-based circuits such as differentiator, integrator, and inverting, non-inverting, summing & differential amplifier.	
CO4.	**Understanding** the concepts of number system, Boolean algebra and logic gates.	
CO5.	**Applying** the knowledge of series, parallel and electromagnetic circuits.	
Course Content:		
Unit-1:	**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),	**8 Hours**

	calculation of ripple factor of rectifiers, clipping and clamping circuits, Zener diode and its application as shunt regulator	
Unit-2:	**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	**8 Hours**
Unit-3:	**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.	**8 Hours**
Unit-4:	**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.	**8 Hours**
Unit-5:	**Switching Theory:** Number system, conversion of bases (decimal, binary, octal and hexadecimalnumbers), Addition & Subtraction, BCD numbers, Boolean algebra, De Morgan's Theorems, Logic gates and truth table- AND, OR & NOT, Seven segment display & K map.	**8 Hours**
Text Books:	**1.** Robert Boylestad & Louis Nashelsky, Electronic Circuit and Devices, Pearson India.	
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.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=USrY0JspDEg 2. https://www.youtube.com/watch?v=Hkz27cFW4Xs	

Course Code: **EEC161**	**B.Tech- Semester-I** **Basic Electronics Engineering (Lab)**	**L-0** **T-0** **P-2** **C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the implementation of diode-based circuits.	
CO2.	**Understanding** the implementation of Operational amplifier-based circuits.	

CO3.	**Analyzing** the characteristics of pn junction diode & BJT.	
CO4.	**Analyzing** the different parameters for characterizing different circuits like rectifiers, regulators using diodes and BJTs.	
CO5.	**Analyzing** the truth tables through the different type's adders.	
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)

Course Code: TMU101	**B.Tech- Semester-I** **Environmental Studies**	**L-2 T-1 P-0 C-3**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** environmental problems arising due to constructional and developmental activities.	
CO2.	**Understanding** the natural resources and suitable methods for conservation of resources for sustainable development.	
CO3.	**Understanding** the importance of ecosystem and biodiversity and its conservation for maintaining ecological balance.	
CO4.	**Understanding** the types and adverse effects of various environmental pollutants and their abatement devices.	
CO5.	**Understanding** Greenhouse effect, various Environmental laws, impact of human population explosion, environment protection movements, different disasters and their management.	
Course Content:		
Unit-1:	Definition and Scope of environmental studies, multidisciplinary nature of environmental studies, Concept of sustainability & sustainable development. **Ecology and Environment**: Concept of an Ecosystem-its structure and functions, Energy Flow in an Ecosystem, FoodChain, FoodWeb, Ecological Pyramid& Ecological succession, Study of following ecosystems: Forest Ecosystem, Grass land Ecosystem & Aquatic Ecosystem & Desert Ecosystem.	**8 Hours**
Unit-2:	**Natural Resources:** Renewable & Non-Renewable resources; Landre sources and landuse 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 SpotsofBiodiversityinIndiaandWorld,Conservation,ImportanceandFactorsResponsibleforLossofBiodiversity,BiogeographicalClassification of India	**8 Hours**
Unit-3:	**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	**8 Hours**
Unit-4:	**Environmental policies & practices: Climate change & Global** Warming (Green house Effect),Ozone Layer -Its Depletion and Control Measures, Photo chemical Smog, Acid Rain Environmental laws: Environment protection Act; air prevention & control of pollution act,	**8 Hours**

	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-5:	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 conservation, Environmental communication & public awareness; Case study	**8 Hours**

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.	
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.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=8tamfocnHb8 2. https://www.youtube.com/watch?v=YlE1DDo25IQ	

Course Code: TMUGE101	**B.Tech- Semester-I** **English Communication – I**	**L-2** **T-0** **P-2** **C-3**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Remembering and understanding** of the basic of English grammar and vocabulary.	
CO2.	**Understanding** of the basic Communication process.	
CO3.	**Applying** correct vocabulary and tenses in sentences construction.	
CO4.	**Analyzing** communication needs and developing communication strategies using both verbal & non-verbal method.	
CO5.	**Drafting** applications in correct format for common issues.	
CO6.	**Developing** self-confidence.	
Course Content:		
Unit-1:	**Introductory Sessions** • Self-Introduction • Building Self Confidence: Identifying strengths and weakness, reasons Failure, strategies to overcome Fear of Failure • Importance of English Language in present scenario (Practice: Self-introduction session)	**6 Hours**
Unit-2:	**Basics of Grammar** • Parts of Speech • Tense • Subject and Predicate • Vocabulary: Synonym and Antonym (Practice: Conversation Practice)	**12 Hours**
Unit-3:	**Basics of Communication** • Communication: Process, Types, 7Cs of Communication, Importance & Barrier • Language as a tool of communication • Non-verbal communication: Body Language • Etiquette & Manners • Basic Problem Sounds (Practice: Pronunciation drill and building positive body language)	**10 Hours**
Unit-4:	**Application writing** • Format & Style of Application Writing • Practice of Application writing on common issues.	**8 Hours**
Unit-5:	**Value based text reading:** Short Story (Non- detailed study) • Gift of Magi - O. Henry	**4 Hours**

Text Books:	**1**. Singh R.P., An Anthology of Short stories, O.U.P. New Delhi.	
Reference Books:	**1.** Kumar, Sanjay. & Pushp Lata. "Communication Skills" New Delhi: Oxford University Press. **2.** Carnegie Dale. "How to win Friends and Influence People" New York: Simon & Schuster. **3.** Goleman, Daniel. "Emotional Intelligence' Bantam Book. ***Latest editions of all the suggested books are recommended.**	

Additional electronics reference material:	**1.** https://www.youtube.com/watch?v=4XEa-8HD3lE **2.** https://www.youtube.com/watch?v=sb6ZZ2p3hEM&feature=youtu.be **3.** https://www.youtube.com/watch?v=Df3ysUkdB38 **4.** https://www.youtube.com/watch?v=0LdYaj3jcws **5.** https://www.youtube.com/watch?v=64XIkMqPm_8 **6.** https://www.youtube.com/watch?v=_vS6O8YlMq0	
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	

Evaluation Scheme

Internal Evaluation			**External Evaluation**		**Total Marks**
40 Marks			**60 Marks**		**100**
20 Marks (Best 2 out of Three CTs) ***(From Unit- II, IV & V)***	10 Marks (Oral Assignments) ***(From Unit I & III)***	10 Marks (Attendance)	40 Marks (External Written Examination) ***(From Unit II, IV & V)***	20 Marks (External Viva)* ***(From Unit -1 & III)***	

*Parameters of External Viva

Content	Body Language	Confidence	Question Responsiveness	TOTAL
05 Marks	05 Marks	05 Marks	05 Marks	20 Marks

Note: External Viva will be conducted by 2-member committee comprising

a) One Faculty teaching the class

b) One examiner nominated by University Examination cell.

Each member will evaluate on a scale of 20 marks and the average of two would be the 20 marks obtained by the students.

Course Code: EME161	**B.Tech- Semester-I** **Engineering Drawing (Lab)**	**L-0 T-0 P-4 C-2**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of Engineering Drawing.	
CO2.	**Understanding** how to draw and represent the shape, size & specifications of physical objects.	
CO3.	**Applying** the principles of projection and sectioning.	
CO4.	**Applying** the concepts of development of the lateral surface of a given object.	
CO5.	**Creating** isometric projection of the given orthographic projection.	
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.

Course Code: EME162	**B.Tech- Semester-I** **Workshop Practice (Lab)**	**L-0 T-0 P-4 C-2**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts to prepare simple wooden joints using wood working tools.	
CO2.	**Applying** the techniques to produce fitting jobs of specified dimensions.	
CO3.	**Applying** the concepts to prepare simple lap, butt, T and corner joints using arc welding equipment.	
CO4.	**Applying** the concepts of black smithy and lathe machine to produce different jobs.	
CO5.	**Creating** core and moulds for casting.	
LIST OF EXPERIMENTS:	**Perform any ten experiments selecting at least one from each shop**	
1	**Carpentry Shop**: 1. To prepare half-lap corner joint. 2. To prepare mortise &tenon joint. 3. To prepare a cylindrical pattern on woodworking lathe.	

2	**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	
3	**Black Smithy Shop:** 1. To prepare a square rod from given circular rod 2. To prepare a square U- shape from given circular rod	
4	**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	
5	**Sheet-metal Shop:** 1. To make round duct of GI sheet using 'soldering' process. 2. To prepare a tray of GI by fabrication	
6	**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.	
7	**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)

Course Code: EGP111	**B.Tech- Semester-I** **Discipline & General Proficiency**	**L-0** **T-0** **P-0** **C-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 No		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

Course Code: EAS211	**B.Tech- Semester-II** **Engineering Mathematics-II**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of the wave, diffusion and Laplace equations & Fourier series.	
CO2.	**Understanding** the methods of separation of variables.	
CO3.	**Understanding** the concepts of Fourier series' representation of single variable	

	function.	
CO4.	**Applying** Laplace transform to determine the complete solutions of linear ODE.	
CO5.	**Applying** the method of variations of parameters to find solution of equations with variable coefficients.	
Course Content:		
Unit-1:	**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.	**8 Hours**
Unit-2:	**Series Solutions:** Power Series 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.	**8 Hours**
Unit-3:	**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.	**8 Hours**
Unit-4:	**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.	**8 Hours**
Unit-5:	**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.	**8 Hours**
Text Books:	**1.** 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.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=luJMl37-nso **2.** https://www.youtube.com/watch?v=NdouX5-KD6Y	

Course Code: EAS212	**B.Tech- Semester-II** **Engineering Physics-I**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the basic concepts of interference, diffraction and polarisation.	
CO2.	**Understanding** the concept of bonding in solids and semiconductors.	
CO3.	**Understanding** the special theory of relativity.	
CO4.	**Applying** special theory of relativity to explain the phenomenon of length contraction, time dilation, mass-energy equivalence etc.	
CO5.	**Applying** the concepts of polarized light by the Brewster's and Malus Law.	
Course Content:		
Unit-1:	**Interference of Light:** Introduction, Principle of Superposition, and 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.	**8 Hours**
Unit-2:	**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.	**8 Hours**
Unit-3:	**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.	**8 Hours**
Unit-4:	**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.	**8 Hours**
Unit-5:	**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.	**8 Hours**
Text Books:	1. Elements of Properties of Matter, D. S. Mathur, S. Chand & Co.	
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.**	
Additional	**1.** https://www.youtube.com/watch?v=toGH5BdgRZ4&list=PLD9DDFBD	

electronics reference material:	C338226CA **2.** https://www.youtube.com/watch?v=CuqsU7B1MtU	

Course Code: EAS262	**B.Tech- Semester-II** **Engineering Physics (Lab)**	**L-0 T-0 P-2 C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** of the operation of various models of optical devices.	
CO2.	**Understanding** types of Semiconductors using Hall experiments.	
CO3.	**Applying** the concept of interference, polarization & dispersion in optical devices through Newton's ring, Laser, polarimeter & spectrometer.	
CO4.	**Applying** the concept of resonance to determine the AC frequency using sonometer & Melde's apparatus.	
CO5.	**Applying** the concept of resolving & dispersive power by a prism.	
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. To determine the Planck's constant using LEDs of different colours.	
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)

Course Code: EAS213	**B.Tech- Semester-II** **Engineering Chemistry**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concept of softening & purification of water.	
CO2.	**Understanding** calorific value& combustion, analysis of coal, Physical & Chemical properties of hydrocarbons & quality improvements.	
CO3.	**Understanding** the concept of lubrication, Properties of Refractory & Manufacturing of cements.	
CO4.	**Applying** the concepts of the mechanism of polymerization reactions, Natural and synthetic rubber& vulcanization.	
CO5.	**Applying** the concepts of spectroscopic & chromatographic techniques.	
Course Content:		
Unit-1:	**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, calgonetc	**8 Hours**
Unit-2:	**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.	**8 Hours**
Unit-3:	**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.	**8 Hours**
Unit-4:	**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.	**8 Hours**
Unit-5:	**A. Instrumental Techniques in chemical analysis:** Introduction, Principle, Instrumentation and application of IR, NMR, UV, Visible, Gas Chromatography, Lambert and Beer's Law.	**8 Hours**

	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.	
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.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=RV-OyRTaIOI 2. https://www.youtube.com/watch?v=phhfkikb6Lw	

Course Code: EAS263	**B.Tech- Semester-II** **Engineering Chemistry (Lab)**	**L-0 T-0 P-2 C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of Hardness of water.	
CO2.	**Analyzing** & estimating of various parameters of water.	
CO3.	**Analyzing** of Calorific value of Solid fuel by Bomb calorimeter & Liquid Fuels by Junkers Gas Calorimeter.	
CO4.	**Analyzing** of open & closed Flash point of oil by Cleveland & Pensky's Martens apparatus.	
CO5.	**Analyzing** of viscosity of lubricating oil using Redwood Viscometer.	
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 O_2, CO_2, % 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)

Course Code: EEE217	**B.Tech-Semester-I** **Basic Electrical Engineering**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the basics of Network, AC Waveform and its characteristics.	
CO2.	**Understanding** the basic concept of Measuring Instruments, Transformers & three phase Power systems.	
CO3.	**Understanding** the basic concepts of Transformer.	
CO4.	**Understanding** the basic concept of power measurement using two wattmeter methods.	
CO5.	**Applying** the concept of Kirchhoff's laws and Network Theorems to analyze complex electrical circuits.	
Course Content:		
Unit-1:	**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.	**8 Hours**
Unit-2:	**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.	**8 Hours**
Unit-3:	**Basics of Measuring Instruments:** Introduction to voltmeter, ammeter, Wattmeter & Energy meter.	**8 Hours**
Unit-4:	**Single phase Transformer:** Principle of operation; Types of construction; Phasor diagram; Equivalent circuit; Efficiency and losses.	**8 Hours**
Unit-5:	**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.	**8 Hours**
Text Books:	**1.** 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. 4. Del Toro, Principles of Electrical Engineering, Prentice-Hall International. **5.** W.H. Hayt & J.E. Kemmerly, Engineering Circuit Analysis, McGraw	

	Hill. ***Latest editions of all the suggested books are recommended.**	
Additional electronics reference material:	1. https://nptel.ac.in/courses/108/108/108108076/ 2. https://sites.google.com/tmu.ac.in/dr-garima-goswami/home	

Course Code: EEE261	**B.Tech- Semester-II** **Basic Electrical Engineering (Lab)**	**L-0 T-0 P-2 C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of Kirchoff & Voltage law.	
CO2.	**Understanding** the concepts of dc network theorem.	
CO3.	**Analyzing** the energy by a single-phase energy meter.	
CO4.	**Analyzing** the losses and efficiency of Transformer on different load conditions.	
CO5.	**Analyzing** the electrical circuits using electrical and electronics components on bread board.	
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.

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)

Course Code: EEC211	**B.Tech- Semester-II** **Basic Electronics Engineering**	**L-3 T-1 P-0 C-4**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of electronic components like diode, BJT & FET.	
CO2.	**Understanding** the applications of pn junction diode as clipper, clamper, rectifier & regulator whereas BJT & FET as amplifiers	
CO3.	**Understanding** the functions and applications of operational amplifier-based circuits such as differentiator, integrator, and inverting, non-inverting, summing & differential amplifier.	
CO4.	**Understanding** the concepts of number system, Boolean algebra and logic gates.	
CO5.	**Applying** the knowledge of series, parallel and electromagnetic circuits.	
Course Content:		
Unit-1:	**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	**8 Hours**

	circuits, Zener diode and its application as shunt regulator	
Unit-2:	**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	**8 Hours**
Unit-3:	**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.	**8 Hours**
Unit-4:	**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.	**8 Hours**
Unit-5:	**Switching Theory:** Number system, conversion of bases (decimal, binary, octal and hexa decimal numbers), Addition & Subtraction, BCD numbers, Boolean algebra, De Morgan's Theorems, Logic gates and truth table- AND, OR & NOT, Seven segment display & K map.	**8 Hours**
Text Books:	**1.** Robert Boylestad & Louis Nashelsky, Electronic Circuit and Devices, Pearson India.	
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.**	
Additional electronics reference material:	**1.** https://www.youtube.com/watch?v=USrY0JspDEg **2.** https://www.youtube.com/watch?v=Hkz27cFW4Xs	

Course Code: EEC261	**B.Tech- Semester-II** **Basic Electronics Engineering (Lab)**	**L-0 T-0 P-2 C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the implementation of diode-based circuits.	
CO2.	**Understanding** the implementation of Operational amplifier-based circuits.	
CO3.	**Analyzing** the characteristics of pn junction diode & BJT.	
CO4.	**Analyzing** the different parameters for characterizing different circuits like rectifiers, regulators using diodes and BJTs.	
CO5.	**Analyzing** the truth tables through the different type's adders.	
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)

Course Code: ECS212	**B.Tech Semester-II** Computer System & Programming in C++	**L-3 T-0 P-0 C-3**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concept of various components of computer system	
CO2.	**Understanding** the Object-Oriented Programming Language concepts.	
CO3.	**Analyzing** basic mathematical problem and their solutions through programming	
CO4.	**Applying** the concepts of programming solutions for distinct problems	
CO5.	**Applying** the concepts of scalable solutions through function	
Course Content:		
Unit-1:	**Problem Solving**: Phases of problem solving, Algorithms, Structure Chart, Flow chart, Practice of solving Sequence Problems, Selection Problems, Repetition problem. **Statements for problem solving:** if, switch, while, for, do, break, continue, go to statements.	**8 Hours**
Unit-2:	**Concepts in Computer Application:** Generations, Characteristic and Application of Computers, Functional Component of Computer: CPU, I/O devices, Type of Memory. Translators: Assembler, Compiler, and Interpreter; Number System: Decimal, Octal, Binary and Hexadecimal &their Conversions; Various Codes: BCD, ASCII and EBCDIC and Gray Code.	**8 Hours**
Unit-3:	**Concepts in Operating System**: Purpose, Services, Types, Functions. **Data Communication & Networks:** Types, Topology, IP address classes. C++ Basics: Data types, Variables, Constants, Keywords, Identifiers, Types of Operators, Memory Allocation operators, Expressions, Pre-processor directives, Introduction to Array, Pointers, Structures and Strings.	**8 Hours**
Unit-4:	**Functions:** Scope of variables; Parameter passing; Default arguments; Inline	**8 Hours**

	functions; Recursive functions; Pointers to functions. **C++ Classes and Data Abstraction: Class** Structure, Objects; this pointer; Friend function; Static class members; Constructors and Destructors; Data abstraction. **Inheritance:** Types, Access to the base class members; Virtual base class.	
Unit-5:	**Polymorphism:** Function overloading; Operator overloading; Static Binding and Dynamic bindings; Virtual function: Definition, Call mechanism, Pure virtual functions; Virtual destructors; Abstract Classes. **C++ I/O:** Stream classes hierarchy; Stream I/O; File streams; Overloading << and >> operators; File Modes, Reading and Writing to a file; Formatted I/O.	**8 Hours**
Text Books:	1. Bjarne Stroutrup, The C++ Programming Languge, Adison Wesley.	
Reference Books:	1. Beginning C++, The Complete Language, Horton,SPD/WROX 2. Programming with C++, Radhaganesan, Scitech 3. Projects using C++, Varalaxmi, Scitech 4. Object Oriented modelling & Design, RumBaugh, PHI ***Latest editions of all the suggested books are recommended.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=LZFoktwiars&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2 2. https://www.youtube.com/watch?v=XTiIiI-LOY8&list=PLJvIzs_rP6R73WlvumJvCQJrOY3U5zq1j	

Course Code: ECS262	**B.Tech - Semester-II** **Computer System & Programming in C++ (Lab)**	**L-0 T-0 P-2 C-1**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of execution to programs written in C language.	
CO2.	**Applying** to prepare programming solutions for specific problems.	
CO3.	**Applying** to prepare scalable solutions through functions.	
CO4.	**Applying** basic elements of a C program including arithmetic and logical operators, functions, control structures, and arrays	
CO5.	**Analyzing** basic mathematical problem and their solutions through programming.	
LIST OF EXPERIMENTS:	**Note: Minimum 15 experiments should be performed from the following:**	
1	Write a Program (WAP) to calculate Sum & average of N numbers.	
2	WAP to convert integer arithmetic to a given number of day and month.	
3	WAP to find maximum and minimum out of 3 numbers a, b & c.	

4	WAP to find factorial of positive integer.	
5	WAP to find sum of series up to n number, 2+5+8+……+n.	
6	WAP to print all the number between 1 to 100 which are dividing by 7.	
7	WAP to generate Fibonacci series up to n.	
8	WAP to calculate area of circle using Functions.	
9	WAP to calculate factorial of given number using Recursion function.	
10	WAP to find whether number is prime or not.	
11	WAP to find that the enter character is a letter or digit.	
12	WAP to find addition of two matrix of n*n order.	
13	WAP to find multiplication of two matrix of n*n order.	
14	WAP to find even or odd up to a given limit n.	
15	WAP to find whether a given no is palindrome or not.	
16	WAP to Swap two numbers using third Variable and without using third variable.	
17	WAP to Swap two numbers using call by value and call by reference.	
18	WAP illustrating overloading of various operators.	
19	WAP illustrating use of Friend	
20	WAP illustrating use of Inline Function.	
21	WAP illustrating use of destructor and various types of constructor.	
22	WAP illustrating various forms of Inheritance.	
23	WAP illustrating use of virtual functions, virtual Base Class.	

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)

Course Code: TMUGE201	**B.Tech - Semester-II** **English Communication – II**	**L-2** **T-0** **P-2** **C-3**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Remembering & understanding** the basics of English Grammar and Vocabulary.	
CO2.	**Understanding** the basics of Listening, Speaking & Writing Skills.	
CO3.	**Understanding** principles of letter drafting and various types of formats.	
CO4.	**Applying** correct vocabulary and grammar in sentence construction while writing and delivering presentations.	
CO5.	**Analyzing** different types of listening, role of Audience & Locale in presentation.	
CO6.	**Drafting** Official Letters, E-Mail & Paragraphs in correct format.	
Course Content:		
Unit-1:	**Functional Grammar** • Prefix, suffix and One words substitution • Modals • Concord	**10 Hours**
Unit-2:	**Listening Skills** • Difference between listening & hearing, Process and Types of Listening • Importance and Barriers to listening	**04 Hours**
Unit-3:	**Writing Skills** • Official letter and email writing • Essentials of a paragraph, • Developing a paragraph: Structure and methods Paragraph writing (100-120 words)	**12 Hours**
Unit-4:	**Strategies & Structure of Oral Presentation** • Purpose, Organizing content, Audience & Locale, Audio-visual aids, Body langauge • Voice dynamics: Five P's - Pace, Power, Pronunciation, Pause, and Pitch. • Modes of speech delivery and 5 W's of presentation	**8 Hours**

Unit-5:	**Value based text reading:** Short Essay (Non- detailed study) How should one Read a book? - Virginia Woolf	**6 Hours**
Text Books:	**1.** Singh R.P., An Anthology of English Essay, O.U.P. New Delhi	
Reference Books:	**1.** Nesfield J.C. "*English Grammar Composition & Usage*" Macmillan Publishers **2.** Sood Madan "*The Business letters"* Goodwill Publishing House, New Delhi **3.** Kumar Sanjay & Pushplata "*Communication Skills*" Oxford University Press, New Delhi. ***Latest editions of all the suggested books are recommended.**	

Additional Electronics Reference Material	**1.** https://www.youtube.com/watch?v=A0uekze2GOU **2.** https://www.youtube.com/watch?v=JIKU_WT0Bls **3.** https://www.youtube.com/watch?v=3Tu1jN65slw **4.** https://youtu.be/sb6ZZ2p3hEM **5.** https://youtu.be/yY6-cgShhac **6.** https://youtu.be/cc4yXwOQsBk **7.** https://youtu.be/yY6-cgShhac **8.** https://youtu.be/84qoeCofXXQ **9.** https://www.youtube.com/watch?v=-9MXmxLisI8&t=28s	
Methodologies:	**1.** Words and exercises, usage in sentences. **2.** Language Lab software. **3.** Sentence construction on daily activities and conversations. **4.** Format and layout to be taught with the help of samples and preparing letters on different subjects. **5.** JAM sessions and Picture presentation. **6.** Tongue twisters, Newspaper reading and short movies. **7.** Modern Teaching tools (PPT Presentation, Tongue-Twisters & Motivational videos with sub-titles) will be utilized. **8.** Text reading: discussion in detail, critical appreciation by reading the text to develop students' reading habits with voice modulation.	

Evaluation Scheme

Internal Evaluation			External Evaluation		Total Marks
40 Marks			60 Marks		
20 Marks (Best 2 out of Three	10 Marks (Oral	10 Marks (Attendance)	40 Marks (External Written	20 Marks	100
CTs)	Assignments)		Examination)	(External Viva)*	
(From Unit-I, III & V)	***(From Unit-II &IV)***		***(From Unit-1, III & V)***	***(From Unit- II & IV)***	

*Parameters of External Viva

Content	Body Language	Communication skills	Confidence	TOTAL
05 Marks	05 Marks	05 Marks	05 Marks	20 Marks

***Note**: External Viva will be conducted by 2-member committee comprising*

***a)** One Faculty teaching the class*

***b)** One examiner nominated by University Examination cell.*

Each member will evaluate on a scale of 20 marks and the average of two would be the 20 marks obtained by the students.

Course Code: EME261	B.Tech- Semester-II **Engineering Drawing (Lab)**	L-0 T-0 P-4 C-2
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of Engineering Drawing.	
CO2.	**Understanding** how to draw and represent the shape, size & specifications of physical objects.	

CO3.	**Applying** the principles of projection and sectioning.	
CO4.	**Applying** the concepts of development of the lateral surface of a given object.	
CO5.	**Creating** isometric projection of the given orthographic projection.	
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.

Course Code: EME262	**B.Tech- Semester-II** **Workshop Practice (Lab)**	**L-0** **T-0** **P-4** **C-2**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts to prepare simple wooden joints using wood working tools.	
CO2.	**Applying** the techniques to produce fitting jobs of specified dimensions.	
CO3.	**Applying** the concepts to prepare simple lap, butt, T and corner joints using arc welding equipment.	
CO4.	**Applying** the concepts of black smithy and lathe machine to produce different jobs.	
CO5.	**Creating** core and moulds for casting.	
LIST OF EXPERIMENTS:	**Perform any ten experiments selecting at least one from each shop**	
1	**Carpentry Shop**: 1. To prepare half-lap corner joint. 2. To prepare mortise &tenon joint. 3. To prepare a cylindrical pattern on woodworking lathe.	
2	**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	
3	**Black Smithy Shop:** 1. To prepare a square rod from given circular rod 2. To prepare a square U- shape from given circular rod	
4	**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	
5	**Sheet-metal Shop:** 1. To make round duct of GI sheet using 'soldering' process. 2. To prepare a tray of GI by fabrication	
6	**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.	
7	**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)

Course Code: EGP211	B.Tech- Semester-II **Discipline & General Proficiency**	L-0 T-0 P-0 C-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 No		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**	**3.5**

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.

Course Outcomes:	**On completion of the course, the students will be :**
CO1.	Understanding the concept and applications of propositional and predicate calculus.
CO2.	Understanding the concepts needed to test the logic of a program.
CO3	Understanding discrete structures such as sets, relations and functions.
CO4.	Understanding the concepts like Permutations and Combinations, Recurrence Relations Generating functions, Binomial Theorem.
CO5.	Understanding how Graphs and Trees are used as tools and Mathematical Models in the study of networks

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)**

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	3.5

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.

Course Outcome:

CO1.	***Understanding*** of different data structures and their usage.
CO2.	***Applying*** the understanding to solve basic operations on data structures.
CO3.	***Analyzing*** various approaches to solve different problems using data structures.
CO4.	***Analyzing*** various methods and the best solution as per running time of basic problems of programming.
CO5.	***Developing*** programming skills to solve problems with various storage structures.

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)

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	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the basics of data base systems, structure and architecture, data models and types.
CO2.	Understanding different transaction processing concepts and different types of serialization techniques.
CO3	Understanding different database recovery like shadow paging, deferred/immediate updates and Concurrency control techniques
CO4.	Applying integrity and constraints using SQL and PL/SQL.
CO5.	Analyzing the anomalies of database and removal of these anomalies using different normalization techniques.

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)

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	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the basics of Number system, Boolean algebra and its applications in digital electronics.
CO2.	Understanding different combinational and sequential circuits in digital electronics.
CO3.	Understanding the organization of computer system and its components, memory hierarchy, I/O mechanism.
CO4.	Applying the concepts to design various combinational and sequential circuits.
CO5.	Analyzing the efficiency of various gates and flip-flops based upon their functionality.

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)

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	3.5

Course Outcomes:	On completion of the course, the students will be :
CO1.	**Understanding** the concepts of singularities, zeroes and poles, functions , relations, propositions, truth tables, logical equivalence and implications, converse, inverse, bi-conditional statements, negation of compound statements, tautologies and contradiction, arguments, fallacies, quantifiers.
CO2.	**Applying** the concept of power series, Taylor's and Laurent's series, Cauchy's integral theorem, Cauchy's integral formula for derivatives of analytic functions, Residue theorem.
CO3.	**Applying** the core mathematics concept to solve the problems.
CO4.	**Analyzing** the 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 and Normal distribution.
CO5.	**Evaluating** the real integral of the type $\int_0^{2\pi} f(\cos\theta, \sin\theta)d\theta$, Line integral in the complex plane.

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; Liouvilles 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)

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the Concept and importance of management and its functions, organizational behavior, challenges for management
CO2.	Understanding flow and formation of powers and politics in organizational groups
CO3.	Analyzing Perception and Thinking process of individual, personality traits and its importance
CO4.	Analyzing Theories of motivation and leadership and its importance and applicability into business
CO5.	Analyzing change in organization and Conflict management.

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)

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 Organsational 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	3	1.5

Course Outcomes:	On completion of the course, the students will be :
CO1.	***Applying*** the concept of different data types and their usage using C++ Programs.
CO2.	***Applying*** the concept of recursion for problem solving.
CO3.	***Applying*** the programming constructs and their usage for problem solving.
CO4.	***Applying*** the understanding to solve basic operations searching, sorting, insertion, deletion on data structures.
CO5.	***Developing*** programming skills to solve problems with various storage structures like stack, queue, linked list and tree.

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.

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

Course Code: ECS356

L	T	P	C
0	0	3	1.5

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the concepts of DML operation to database table to complete different queries on database.
CO2.	Applying the concepts of different DDL operations.
CO3.	Applying the concepts of DCL operations like grant and revoke for administration purpose on a table.
CO4.	Applying the concepts of PL/SQL for creating different triggers to develop event driven action in database.
CO5.	Analyzing the concepts of PL/SQL for creating functions and procedure to apply DML on tables

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.

1.

B.Tech (CSE) Semester III

DIGITAL LOGIC CIRCUIT (LAB)

Course Code: EEC351

L	T	P	C
0	0	3	1.5

Course Outcomes:	On completion of the course, the students will be :
CO1.	Applying the concept of basic gates to design combinational circuits and verify using truth table.
CO2.	Applying the concept of flip-flops to design sequential circuits and verify using truth table.
CO3.	Applying the concepts to design registers
CO4.	Applying the concepts to design counters.
CO5.	Applying the concepts of AND & OR Gate.

1) To study of following combinational circuits: Multiplexer, Demultimplexer 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 table multi-vibrator.
8) Experimental study of characteristics of CMOS integrated circuits.
9) Interfacing of CMOS to TTL and TTL to CMOS.
10) BCD to binary conversion on digital IC trainer.
11) Testing of digital IC by automatic digital IC trainer.
12) To study OP-AMP as Current to Voltage & Voltage to Current converters & comparator.

Semester-III
English Communication and Soft Skills-III

Course Code: EHM349

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:	On completion of the course, the students will be :
CO1.	Remembering and understanding the English grammar and vocabulary
CO2.	Understanding the art of public speaking and strategies of reading comprehension.
CO3.	Applying correct vocabulary and sentence construction during public speaking or professional writing.
CO4.	Aanalyzing different types of sentences like simple, compound and complex.
CO5.	Creating skills for Drafting notice, agenda and minutes of the meeting.

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

<table>
<tr><th colspan="2">Internal Evaluation</th><th colspan="2">External Evaluation</th><th>Total Marks</th></tr>
<tr><td colspan="2">40 Marks</td><td colspan="2">60 Marks</td><td rowspan="2">100</td></tr>
<tr><td>30 Marks
(Progressive Evaluation)
After each unit-completion: Assignments / oral Presentation</td><td>10 Marks (Attendance)</td><td>20 Marks
Midway external assessment
(Oral Presentation) *</td><td>40 Marks
(Written Examination)</td></tr>
</table>

*** 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.*

B.Tech (CSE) Semester IV

THEORY OF COMPUTATION

Course Code: ECS401

L	T	P	C
3	1	0	3.5

Objective:

To gain knowledge of Computer Automation and Computation.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the fundamentals of Computational theory and basic terminology used.
CO2.	Understanding basics of various machines used for computations like FSM, PDA, TM.
CO3.	Understanding the grammar, language, formation of regular expression in FA, minimization of FA and CFG.
CO4.	Applying the concepts to design various machines like FSM, PDA etc.
CO5.	Analyzing the efficiency of various machines based upon their functionality and limitations.

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 € 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 Tuning Machine, TM Definition, TM Model, Design of TM. **(Lecture 08)**

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	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the functionality of design applications of C++.
CO2.	Understanding the basic structure of C++ program and the process of object oriented modeling.
CO3.	Understanding the Concept includes C++ Classes and Data Abstraction with full use of inheritance
CO4.	Understanding polymorphism and the main functionality of virtual.
CO5.	Understanding file management and its various operations

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.

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	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the basic concepts of software development life cycle and various process models of software development.
CO2.	Understanding the concepts of agile software development and the basics of requirements engineering.
CO3.	Understanding the concepts of software design
CO4.	Understanding the concepts of coding approach, software testing and software reliability.
CO5.	Understanding the concepts of software maintenance & its types, reverse engineering and CASE tools.
CO6.	Applying software design techniques with the help of flow charts, ERD and DFD.

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)

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	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the importance of curve fitting, regression and frequency charts and its applications to solve problems.
CO2.	Understanding the importance of time series and forecasting models, Statistical Quality Control and Testing of Hypothesis to apply various test and its applications to solve problems.
CO3.	Applying numerical methods to find our solution of algebraic linear equations using different methods under different conditions, and numerical solution of system of algebraic linear equations.
CO4.	Applying numerical methods to find our solution of non linear equations using different methods under different conditions, and numerical solution of system of non linear equations. Also work out numerical differentiation and integration whenever and wherever routine methods are not applicable.
CO5.	Applying various interpolation methods and finite difference concepts.

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; Smoothening of curves; Forecasting Models and Methods; Statistical Quality Controls Methods, **Testing of Hypothesis:** Test of Significance; Chi-square Test; T-Test; ANOVA; F-Test; Application to Medicine; Agriculture.

(Lecture 08)

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	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the concepts and states of process, also evaluating the use of various scheduling algorithms and finding the suitability for their usage.
CO2.	Understanding and Analyzing various issues in Inter Process Communication (IPC) and the role of OS in IPC, also understanding the various characteristics of deadlock and applying the learnt concepts and algorithm to avoid and recover from the deadlock.
CO3.	Understanding the concepts and implementation of various Memory management policies and usage of the virtual memory.
CO4.	Applying the basics of operating system along with the types and main functionalities of the operating system
CO5.	Applying the file management policies and disk structure along with scheduling algorithm for applying it to solve the disk scheduling problems.

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)

Text Books

1. Silbershatz, 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	3.5

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Importance of Resources , Renewable Energy, Technology, Sustainable Development
CO2.	Ethics in developing and using Technologies
CO3.	Ethics for business and profession, organizational groups
CO4.	Inculcation the importance of human values, moralities in profession and crisis management
CO5.	Understanding the corporate responsibilities in regard of society

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)**

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding of object oriented programming features.
CO2.	Understanding the Concept of inheritance and polymorphism.
CO3.	Understanding the Concept of virtual function, base class and containership.
CO4.	Understanding the Concept of operator overloading.
CO5.	Understanding the Searching and sorting methods and implementation.

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:

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

Course Code: ECS453

L	T	P	C
0	0	3	1.5

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding floating point arithmetic operations.
CO2.	Understanding various Algebraic and transcendental equations.
CO3.	Applying various interpolation formula's for solving mathematical problems.
CO4.	Applying linear and non linear regression methods with the help of least square.
CO5.	Applying various formulae's of numerical integration and differentiations techniques to solve problems.

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.

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

Course Code: ECS454

L	T	P	C
0	0	3	1.5

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding UNIX components and its environment.
CO2.	Understanding the usage of basic UNIX commands.
CO3.	Understanding the backup, recovery and user authorization with use of commands.
CO4.	Understanding the Source code control system and how to use debugging tools.
CO5.	Understanding the Design the script based programs using shell & awk script.

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.

B.Tech (CSE) 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.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Remembering and understanding the English grammar and vocabulary.
CO2.	Understanding the essentials of effective listening and speaking.
CO3.	Understanding the corporate expectations and professional ethics.
CO4.	Applying correct vocabulary and sentence construction during professional writing or job interviews.
CO5.	Aanalyzing different types of interviews.
CO6.	Developing the skills to create resume, C.V. or cover letter.

List of Practical: **(Total: 40 Hours)**

1.Practice on syllable, word stress and intonation. **(02 hours)**
2.Practiceon 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 playin 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.

Evaluation Scheme

Evaluation: 100 Marks

Internal Evaluation		*External Evaluation*		*Total*
50		50		100
Progressive Evaluation: Lab Activities / Assignment / Oral Presentation	*Attendance*	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**

Content	*Language*	*Oral Presentation*	*Body Language*	*Question Responsiveness*	*Total*
5	5	5	5	5	25

Note: *To take corrective actions, midway assessment will be conducted by 2-member committee ofDirector'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**

Content	*Language*	*Oral Presentation*	*Body Language*	*Question Responsiveness*	*Total*
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.

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

Course Code: ECS501

L	T	P	C
3	1	0	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the structure of compiler
CO2.	Understanding the basic techniques used in compiler construction such as lexical analysis, top-down, bottom-up parsing, intermediate code generation
CO3.	Understanding the design parsing tables from grammars
CO4.	Understanding the basic data structures used in compiler construction such as abstract syntax trees, symbol tables, three-address code
CO5.	Understanding syntax directed translation scheme

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)

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.

B.Tech (CSE) Semester V

COMPUTER ARCHITECTURE

Course Code: ECS502

L	T	P	C
3	1	0	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the theory and architecture of central processing unit.
CO2.	Understanding the concepts of parallel processing, pipelining and interprocessor communication.
CO3.	Understanding the impact of instruction set architecture on cost-performance of computer design.
CO4.	Understanding dynamic scheduling methods and their adaptation to contemporary microprocessor design.
CO5.	Analyzing microprocessor architecture and apply assembly language programming.

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, Shuffle Exchange and Omega Network, SIMD matrix multiplication.
Multiprocessor Architecture: Tightly and loosely coupled multiprocessors.

(Lectures 08)

Unit IV

Multiprocessor Scheduling: Strategies and Deterministic Scheduling Models, 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)

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	3.5

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the basic concept of algorithm design, algorithm efficiency, run time complexity computation, divide and conquer concept of algorithm design, binary search algorithm analysis, divide and conquer approach analysis.
CO2.	Understanding concept of greedy method in problem solving, exact optimization solution for minimum cost spanning tree, approximate solution for knapsack problem, single shortest path computation.
CO3.	Applying concept of dynamic programming in problem solving, dynamic programming vs divide and conquer, shortest path computation application, matrix multiplication application, traveling salesman problem application, longest common subsequence application.
CO4.	Applying concept of graph problem to get solutions of depth first search method, breadth first search method, back tracking, 8-queen problem, knapsack problem.
CO5.	Analyzing the concept of branch and bound method, LC searching bounding, FIFO branch and bound, 0/1 knapsack problem, travelling salesman problem, complexity measures, polynomial v/s non-polynomial time complexity, NP-hard and NP-complete problem.

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)

Text Books

1.Coremen, 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	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the object-oriented approach of programming, basic building blocks of java programming, java development environment, datatypes, class, methods, and various predefine packages.
CO2.	Understanding the various predefine classes, interfaces, which deals with networking, understanding the basic approach of graphical user interface design using Abstract window toolkit and Applet.
CO3.	Understanding the basic concept of Event handling, Applying the concept of thread and multithreading.
CO4.	Understanding the Database connectivity using java, along with the classes and methods of java.sql package and creating basic programs using this package.
CO5.	Applying the graphical user interface design concept using Swing.
CO6.	Analyzing the predefine methods and interfaces of Swing package and creating basic user interface using swing.

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)

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	3.5

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the Concept and meaning of Economics/Managerial Economics
CO2.	Understanding the Concepts and theories of demand & supply
CO3.	Understanding the Demand forecasting in business
CO4.	Understanding the Concepts of market
CO5.	Understanding the Economic Status of the country by the concepts of GDP

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Applying divide and conquer concept of algorithm in binary search, quick sorting and merge sorting.
CO2.	Applying concept of greedy method in exact optimization solution for minimum cost spanning tree, approximate solution for knapsack problem, single shortest path computation.
CO3.	Applying concept of dynamic programming in shortest path computation application, matrix multiplication application, traveling salesman problem application, longest common subsequence application.
CO4.	Applying concept of graph in to find solution of depth first search method, breadth first search method, back tracking, 8-queen problem, and knapsack problem.
CO5.	Analyzing backtracking concept in connected components computation in graph

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 Stassen'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 (Dijkastra'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.

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

Course Code: ECS554

L	T	P	C
0	0	4	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Applying knowledge to solve real world problems based on object-oriented principles.
CO2.	Applying the basic approach of graphical user interface design using Abstract window toolkit, Applet and swing packages, create some application that are based upon some real world scenario
CO3.	Analyzing the concept of database handling and creating application that are able to communicate with various database.
CO4.	Analyzing the web architecture for creating applications using servlets and java server pages.
CO5.	Analyzing the Client server architecture, Understanding the Remote method invocation architecture and creating basic application using Remote method invocation.

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.

B.Tech (CSE) Semester V
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:	On completion of the course, the students will be :
CO1.	Understanding the Formulate their CVs along with cover letter in Job oriented perspective.
CO2.	Understanding the Communicate technically in functional context.
CO3.	Understanding the Proactively participate in Job Oriented activities. (Like Interview, GD etc.)
CO4.	Understanding the skills required in corporate world.

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

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*

- ***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

B.Tech (CSE) Semester V
INDUSTRIAL TRAINING

Course Code: ECS591

L	T	P	C
0	0	0	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding knowledge through research and development on latest technology.
CO2.	Developing greater clarity about academic and career goals
CO3.	Understanding of administrative functions and company culture
CO4.	Applying critical reasoning and independent learning
CO5	Developing ability to effectively communicate solution to problems (oral, visual, written).

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 Director of the college.

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

The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned. Not more than three students would form a group for such industrial training/ project submission.

The marking shall be as follows.

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

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

B.Tech (CSE) Semester V

ERP System

Course Code: ECS506

L	T	P	C
3	1	0	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Applying the waterfall model in the development of ERP applications.
CO2.	Analyzing the design and implementation of an e-commerce application with a shopping cart.
CO3.	Analyzing the user-centered design guidelines in developing user-friendly websites.
CO4.	Analyzing the bullwhip effect in a supply chain, analyze the causes, and recommend possible solutions.
CO5.	Analyzing different types of portal technologies and deployment methodologies commonly used in the industry.

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)**

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	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the basic concept of mobile computing, wireless networks, structure of mobile computing based application.
CO2.	Understanding various schemes like Fixed Assignment Schemes, Random Assignment Schemes, Reservation Based Schemes.
CO3.	Understanding the mobile IP, Key functionality of IP, Choose the required functionality at each layer for given application.
CO4.	Understanding the hand-off process in mobile communication
CO5.	Analyzing solution for each functionality at each layer x Use simulator tools and design Ad hoc networks

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)**

1.

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	3.5

Objective:
To learn the core knowledge of multimedia systems and animation.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding multimedia, it's applications, supporting hardware and hardware tools which provide basic information about multimedia
CO2.	Applying various tools on image and video standards using JPEG, MPEG, MHEG along with color models and multimedia monitor bitmaps to properly represent a multimedia application.
CO3.	Applying the multimedia drawing tools and techniques with the effect of animation using multi layer concepts supported by flash incorporating text, audio, video and graphics.
CO4.	Applying the different compression approaches like lossy and lossless with the specifications of sampling variables associated with digital audio
CO5.	Analyzing 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.

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 gen7eration, 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, Lossygraphic compression, 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)

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.

B.Tech (CSE) Semester VI
ARTIFICIAL INTELLIGENCE

Course Code: ECS601

L	T	P	C
3	1	0	3.5

Objective:
To learn the techniques of artificial intelligence to the computer.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the role of PROLOG for implementation of solutions of AI problems
CO2.	Understanding the architecture and evaluation scheme of PROLOG
CO3.	Applying the PROLOG for solving trivial problems
CO4.	Applying the solutions for Water Jug problem, Eight Puzzle problem, Monkey Banana problem using PROLOG
CO5.	Applying the various knowledge representation structures.

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)

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	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the basics concepts of computer graphics
CO2.	Understanding output primitives generating algorithms
CO3.	Understanding 2d and 3d transformation techniques
CO4.	Understanding the concepts of window/viewport transformation
CO5.	Understanding the concept of computer animation

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)**

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 Sprou,l 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	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the fundamentals of computer networks, their types, transmission modes, and various reference models.
CO2.	Understanding error-free transmission of data along with data collision.
CO3.	Understanding addressing techniques and transmission modes of a network.
CO4.	Understanding the working of application layer protocols and the impact of network security tools on an existing systems.
CO5.	Applying various routing and congestion control algorithms over a network and Identify Quality of service parameters and addressing techniques.

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)

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.

B.Tech (CSE) 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 Outcomes:	On completion of the course, the students will be :
CO1.	Students will be able to communicate effectively.
CO2.	Understanding how to develop their personality and soft skills.
CO3.	Understanding how to face interview confidently.
CO4.	Understanding how to participate actively in group discussion.
CO5.	Applying various values and ethics in their life.

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 speakon the above topics
Writing: Making the students write on the given topics

Unit -2Technical Vocabulary and Presentation **(06 hours)**

a) Abbreviations and Technical terms of Computer Science
b) Writing Paragraph on Eminent Personalitiesin 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) SpeechonEminent Personalitiesin the field of Computer Science and Information Technology: Sundar Pichai, N. R. Narayana Murthy, Azim Premji, Nandan Nilekani, Sam Pitroda and Pranav Mistry.
d) Presentationon 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 speakon 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 speakon 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 speakeffectively 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*, PearsonEducation, New Delhi.

Reference Books:

1. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practices*, O.U.P. New Delhi. 2008.
2. Chabbra T N, *Business Communication*, Sun India Pub. New Delhi.
3. Sehgal M.K. & Khetrapal Vandana, *Business Communication*, Excel Books, New Delhi.
4. Newstron 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

Evaluation Scheme

Evaluation: 100 Marks

Internal Assessment	*External Written Exam*	*Total*
40	60	100

Internal Assessment: 40 Marks

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

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

Course code: ECS610

L	T	P	C
3	1	0	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding of the information system architecture and the involved components.
CO2.	Understanding of the basic principles of Information Security, Online payment systems and related security issues along with the rules of E Governance.
CO3.	Applying and regulating Cyber Laws dealing with Cyber Ethics by implementation of Intellectual Property Right in the areas of Copyright, Patent, Piracy and Plagiarism.
CO4.	Analyzing the security of Cryptographic System and design and implementation issues related with Firewalls, Virtual Private Networks and Intrusion Detection Systems.
CO5.	Analyzing the need of physical security in Information System, need of Biometric Security System and related challenges.

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)

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the role of PROLOG for implementation of solutions of AI problems
CO2.	Understanding the architecture and evaluation scheme of PROLOG
CO3.	Applying the PROLOG for solving trivial problems
CO4.	Applying the solutions for Water Jug problem, Eight Puzzle problem, Monkey Banana problem using PROLOG
CO5.	Applying the various knowledge representation structures.

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 COUNTE PROPAGATION NETWORK.

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

Course Code: ECS654

L	T	P	C
0	0	4	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the working of network simulation tool (Packet Tracer)
CO2.	Understanding about basic network connectivity. Understand IOS used for networking devices
CO3.	Understanding about ARP table. Analyzing some trouble shooting commands
CO4.	Applying the knowledge to Configure the initial switch and router setting, Understand TCP/IP and OSI models
CO5.	Analyzing MAC and IP addresses, Learn about TCP and UDP communications.

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.

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

Course Code: ECS653

L	T	P	C
0	0	3	1.5

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the general software architecture of programs that use computer graphics.
CO2.	Understanding system architecture for computer graphics. ...
CO3.	Analyzing a current 3D graphics API

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.

B.Tech (CSE) Semester VI
REAL TIME OPERATING SYSTEM

Course Code: ECS606

L	T	P	C
3	1	0	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding fundamentals of IEEE standards.
CO2.	Understanding the concept of communications among processes in RTOS.
CO3.	Understanding the concept of CPU module and peripheral interfaces.
CO4.	Applying the concept of Synchronization
CO5.	Analyzing the architecture and salient features deadlock and fault tolerance.

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, Inter Process 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)

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	3.5

Objective:

To provide understanding of emerging field of fuzzy neural network and its application into various areas is covered.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the architecture and algorithms for artificial neural network.
CO2.	Understanding the classical and fuzzy set along with membership function.
CO3.	Applying the learnt concept for solving the numerical problems using fuzzy operations.
CO4.	Applying fuzzy arithmetic and approximate reasoning on fuzzy sets.
CO5.	Developing the uncertainty and non specificity for fuzzy and crisp set.

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)

1.

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.

B.Tech (CSE) Semester VI

MICROPROCESSOR & APPLICATION

Course Code: EEC606

L	T	P	C
3	1	0	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding fundamentals of microprocessor 8085 and microprocessor 8086.
CO2.	Understanding the concept of assembly language programming.
CO3.	Understanding the concept of CPU module and peripheral interfaces.
CO4.	Applying the concept of assembly language to solve problems.
CO5.	Analyzing the architecture and salient features of microprocessor and microcontrollers.

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)

1.

Text Books:

1. Gaonkar Ramesh S., *Microprocessor Architecture, Programming, and Applications with the8085*, Pen Ram International Publishing.
2. Ray, A.K. &Burchandi, K.M., *Advanced Microprocessors and Peripherals: ArchitectureProgramming 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	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the term 'e-commerce' and the need of ecommerce.
CO2.	Understanding the role of information systems in organizations, the strategic management processes, and the implications for the management.
CO3.	Understanding about the importance of managing organizational change associated with information systems implementation.
CO4.	Applying 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.
CO5.	Analyzing the importance of managing organizational change associated with information systems implementation.

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)

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 VII

WEB-TECHNOLOGY (DESIGN & ARCHITECTURE USING .NET)

Course Code: ECS701

L	T	P	C
3	1	0	3.5

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding basic components of a Web Technology (Design And Architecture Using .NET).
CO2.	Understanding various categories of programs, Web, Window and Console Application. Organize and work with many projects.
CO3.	Applying skills and concepts to built small real life applications using Web Technology (Design And Architecture Using .NET) standards.
CO4.	Analyzing the usage of the Web Technology (Design And Architecture Using .NET) programs to create professional, academic, business and many software projects.
CO5.	Developing personal, academic and business documents by following the current professional and/or industry standards.

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 & 3.5) 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 your site; 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)

Text Books

1. Hejsberg, A. and Wiltamuth, S., *C# Developers Guide*, Addison-Wesley.
2. Parihar, M., Ahmad, E., ASP ·Net *Programming Bible*t, Wiley.
3. Laura, L., Rafe, C., *Teach Yourself: Web Publishing with HTML and CSS in One Hour aDay*,Sams.

Reference Books

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

*Latest editions of all the suggested books are recommended.

B.Tech (CSE) Semester VII

CRYPTOGRAPHY AND NETWORK SECURITY

Course Code: ECS703

L	T	P	C
3	1	0	3.5

Objective:

- To gain knowledge about various cryptographic methods.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding vulnerability and the weaknesses of unsecured network
CO2.	Understanding information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of network security.
CO3.	Applying different encryption and decryption techniques to solve problems related to confidentiality and authentication
CO4.	Analyzing the performance of different encryption algorithms for verifying the integrity of varying message sizes.
CO5.	Analyzing different digital signature algorithms to achieve authentication and create secure applications
CO6.	Developing a secure network system using cryptographic utilities and authentication mechanisms.

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)

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	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the processes that exist primarily for supporting the management of software development, and are generally skewed toward addressing business concerns
CO2.	Understanding the concepts to address specific management needs at the individual, team, division and/or organizational level
CO3.	Applying a strong working knowledge of ethics and professional responsibility. Understanding effective organizational leadership and change skills for managing projects, project teams, and stakeholders.
CO4.	Analyzing the leadership effectiveness in organizations ,team-building skills required to support successful performance
CO5.	Analyzing the selection and initiation of individual projects and of portfolios of projects in the enterprise.
CO6.	Analyzing project planning activities that accurately forecast project costs, timelines, and quality. Implement processes for successful resource, communication, and risk and change management.
CO7.	Developing Practical applications of project management to formulate strategies allowing organizations to achieve strategic goals

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)**

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding basic components of a Web Technology (Design And Architecture Using .NET).
CO2.	Understanding various categories of programs, Web, Window and Console Application. Organize and work with many projects.
CO3.	Applying skills and concepts to built small real life applications using Web Technology (Design And Architecture Using .NET) standards.
CO4.	Analyzing the usage of the Web Technology (Design And Architecture Using .NET) programs to create professional, academic, business and many software projects.
CO5.	Developing personal, academic and business documents by following the current professional and/or industry standards.

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.

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

Course Code: ECS752

L	T	P	C
0	0	4	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Applying the knowledge of symmetric cryptography to implement simple ciphers.
CO2.	Applying the concept to implement public key algorithms like RSA.
CO3.	Applying symmetric cryptography and asymmetric cryptography tools like Diffie Hellman algorithm and Digital Signature to check the integrity of varying message sizes.
CO4.	Analyzing performance of hashing algorithms.
CO5.	Analyzing the different network reconnaissance tools to gather information about networks

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.

B.Tech (CSE) Semester VII
PATTERN RECOGNITION

Course Code: ECS711

L	T	P	C
3	0	0	3

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the concept of a pattern and the various approaches of pattern recognition.
CO2.	Understanding the basic methods of feature extraction, feature evaluation, and dimension reduction of feature vectors.
CO3.	Understanding various supervised and unsupervised learning approaches.
CO4.	Understanding machine learning concepts and range of problems that can be handled by machine learning.
CO5.	Applying both supervised and unsupervised classification methods to detect and characterize patterns in real-world data.

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 Patten 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)**

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the human brain, role of neurons, neuroscience, neuro-computing and learning process in neurons
CO2.	Understanding the basic models and functions of neurons & perceptrons
CO3.	Analyzing the role of mean square and gradient descent algorithm for non linearly separable problems
CO4.	Analyzing the model consisting of multilayer neurons using back propagation for better reliability and approximation
CO5.	Applying the principal component, features of Recurrent network and temporal feed forward network and display their computer simulation

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)

Reference Books:

1. J.A. Anderson, An Intoduction 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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the Concept of Sociology, social structure, social values and its impact on business
CO2.	Understanding the modern societies, industrial capitalism, globalization, service sector
CO3.	Understanding the Technology & work experience, Social background, Stress & anxiety of workers
CO4.	Understanding the Ethics and the professions, Significance of professional Ethics for Engineers, Applied Ethics
CO5.	Understanding the Significance of Ethical Leadership, corporate culture and reputation management, corporate social responsibility

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:

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.

B.Tech (CSE) Semester VII

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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the VC dimension and PAC learning models for noise reduction, model selection and generalization
CO2.	Understanding the role of Bayesian Decision theory for classification
CO3.	Understanding dimensionality reduction principles for scaling and analysis of models
CO4.	Understanding the concept of clustering and maximization algorithm
CO5.	Understanding the back propagation in multilayer neural networks and role of perceptrons in ANN models

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 back propogation 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)

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	3.5

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.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the concept of loss less and lossy data compression techniques.
CO2.	Understanding the methods of loss less image compression, text compression, and audio compression.
CO3.	Understanding statistical basis and performance metrics for lossless as well as lossy compression
CO4.	Analyzing the operation of a range of commonly used Compression techniques
CO5.	Applying loss less and lossy data compression techniques in real-world applications.

Course Contents:

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

Burrows Wheeler Transform: Move-to-front coding, CALIC, JPEG-LS, Multi-resolution Approaches, Facsimile Encoding, Dynamic Markoy 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 Vector Quantizer.

(Lecture 08)

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	3.5

Objective:

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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the based problem formulation
CO2.	Understanding the system
CO3.	Understanding verification, validation
CO4.	Analyzing the experimental design

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)

Text Books:

1. Geoftrey ,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	3.5

Objective:
To understand the Cloud Environment.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the Cloud Computing and its role in current scenario.
CO2.	Understanding the different models of Cloud Computing and their limitations
CO3.	Understanding the virtual data centre architecture, governance strategy, security mechanism and contingency plans.
CO4.	Identifying various risk factors involved in Cloud Computing and to tackle them using risk management techniques
CO5.	Understanding the importance of Cloud services and economic factors related to them
CO6.	Understanding the billing process for usage of Cloud Computing and factors that controls the bill amount
CO7.	Understanding the architecture and considerations for storage network design using technologies like iSCSI, FCIP, FCoE etc.

Course Contents

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)

Text Books:

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

Reference Books:

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

*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

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding research and development on latest technology.
CO2.	Understanding greater clarity about academic and career goals
CO3.	Understanding of administrative functions and company culture
CO4.	Analyzing a capacity for critical reasoning and independent learning
CO5.	Developing ability to effectively communicate solution to problems (oral, visual, written).

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 Director of the college.

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

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

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

The marking shall be as follows.

1.

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	4	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the phases of SDLC and performing initial investigation about project.
CO2.	Understanding to design ER-Diagram and DFD of the project.
CO3.	Applying the designing procedures to design database.
CO4.	Developing SRS Document for the project.
CO5.	Developing Forms and Front end of the Project.

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 Director.

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

B.Tech (CSE) Semester VIII

DATA WAREHOUSING AND DATA MINING

Course Code: ECS801

L	T	P	C
3	2	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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the various components of data warehousing.
CO2.	Understanding the constructs and usage of R-Programming language for developers.
CO3.	Understanding how to design the physical model of data warehouse.
CO4.	Understanding various algorithms of Data Mining and its process.
CO5.	Applying the programming concept to solve problems using R-Programming.
CO6.	Analyzing the concept of data mining using R-Programming.

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)

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	2	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 Outcomes:	On completion of the course, the students will be :
CO1.	Understanding fundamental characteristics of distributed system.
CO2.	Understanding the concept of distributed objects and remote invocation methods.
CO3.	Understanding different distributed models for remote communication.
CO4.	Understanding the security mechanism and protocols for distributed transactions.
CO5.	Analyzing the concept of distributed algorithms and their performance associated with security issues and distributed deadlock.

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, Introduction to Wave & traversal algorithms, Election algorithm.CORBA Case Study: CORBA RMI, CORBA services. **(Lecture 08)**

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
DATA WAREHOUSING AND DATA MINING (LAB)

Course Code: ECS851

L	T	P	C
0	0	4	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding Modeling and design of data warehouse.
CO2.	Understanding how to Install and Configure WEKA Tool
CO3.	Applying the concept to design Modeling and design of data warehouses.
CO4.	Analyzing WEKA Explorer, Mining techniques and Attribute Relation File
CO5.	Developing basic data warehouse applications.

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
DIGITAL IMAGE PROCESSING

Course Code: ECS803

L	T	P	C
3	2	0	4

Objective:

- To gain the knowledge of digital image processing which includes topics like image enhancement, restoration, compression, segmentation etc.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the different types of image transforms and their properties
CO2.	Understanding the different techniques employed for the enhancement of images
CO3.	Understanding the concept of image restoration & degradation models.
CO4.	Understanding various image compression and color models like RGB, CMY.
CO5.	Analyzing various image segmentation techniques to segment the digital image into sub-images.

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)

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	2	0	4

Objective:

- To provide the knowledge of Information Systems in Business.

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the functional areas of business and the interrelationships among the functional areas within a business.
CO2.	Understanding the various quality measure tools.
CO3.	Understanding the SCM. CRM and Procurement Management.
CO4.	Understanding Strategic planning and its advantages.

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)

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
DIGITAL IMAGE PROCESSING (LAB)

Course Code: ECS852

L	T	P	C
0	0	4	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Applying the spatial and frequency domain image enhancement techniques to enhance the brightness and contrast of the blurred images
CO2.	Applying the image enhancement and Image restoration.
CO3.	Applying the loss less and lossy image compression techniques to reduce the number of required bits as much as possible without losing image visual quality
CO4.	Applying the image segmentation techniques to divide the images into sub-images.
CO5.	Applying degradation models to improve the quality of blurred images.

Course Contents

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

B.Tech (CSE) Semester VIII
MANAGEMENT INFORMATION SYSTEM (LAB)

Course Code: ECS853

L	T	P	C
0	0	4	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understand and apply core knowledge of programming, networking, databases, and system design.
CO2.	Analyze, gather requirements, and design systems.
CO3.	Develop, control, and manage projects.

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.

B.Tech (CSE) Semester VIII
ANDROID PROGRAMMING (LAB)

Course Code: ECS854

L	T	P	C
0	0	4	2

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding Activity
CO2.	Understanding view system
CO3.	Understanding menu and its types
CO4.	Applying the web services and map based activity
CO5.	Developing small android based applications.

Course Contents

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

B.Tech (CSE) Semester VIII
PROJECT WORK PHASE-2

Course Code: ECS899

L	T	P	C
0	0	8	4

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the process of Project development.
CO2.	Applying the knowledge to develop applications based on SRS Document.
CO3.	Applying the learning to develop applications on different platforms like Window, Web based or Mobile based applications to specific set of problem and their solutions.
CO4.	Evaluating the test cases results after testing of the project along with different roles.
CO5.	Developing good quality project to solve real world applications.

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 Director.
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


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