COURSE OUTCOME OF COMPUTER SCIENCE &ENGINEERING DEPARTMENT

1ST SEM

Department	Basic Science & Humanities (CSE)
Course Code	HU 101
Title of Course	**English Language & Communication**
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	2L
Total Contact Hours	30
Course Out Come	**CO1**: Ability to communicate technical matters. **CO2**: Ability to communicate fluently & confidently on all spheres of every day matters.

Department	Basic Science & Humanities (CSE)
Course Code	PH-101
Title of Course	Physics-I
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L + 1T
Total Contact Hours	42
Course Out Come	**CO1**: Ability to understand the general property of matters and the Oscillation property. **CO2**: Ability to know optics property. **CO3**: Ability to learn basics of Quantum Physics. **CO4**: Ability to understand Crystallography and will get the idea of crystal structure and will understand the property and behaviour of X-Ray.

Department	Basic Science & Humanities (CSE)
Course Code	M-101
Title of Course	Mathematics –I
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L + 1T
Total Contact Hours	40
Course Out Come	**CO1**: Ability to explain the Knowledge of Matrix, Eigen value problems. **CO2**: Ability to determine the solutions for differential equations which are useful in the Study of Circuit theory and oscillatory systems. **CO3**: Ability to understand Calculus of Functions of Several Variables Partial derivatives, Total differential equations for Electro- magnetic theory, Transmission lines and Vibrating membranes. **CO4**: Ability to use the convergence and Divergence of infinite series in the study of communication systems.

	CO5: Ability to understand Vector Algebra and Vector Calculus.

Department	ECE&EE(CSE)
Course Code	ES101
Title of Course	**Basic Electrical & Electronic Engineering – 1**
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L + 1T
Total Contact Hours	41
Course Out Come	**CO1:** To identify semiconductor materials, draw band-diagrams, distinguish between intrinsic and extrinsic semiconductors, n- and p- type semiconductors, and calculate drift and diffusion current components. **CO2:** To explain the junction properties and the phenomenon of rectification, draw the I-V characteristics and identify operating points; Calculate ripple factors, efficiency of power supplies. **CO3:** To elaborate the I-V characteristics of BJTs – inputs and outputs; learn to bias transistors, both as amplifiers and switches; identify operating points.

Department	ME(CSE)
Course Code	ME101
Title of Course	Engineering Mechanics
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L + 1T
Total Contact Hours	48
Course Out Come	**CO1:** To illustrate the concept of Particle and Rigid Body; Types of forces: collinear, concurrent, parallel, concentrated, distributed; Vector and scalar quantities; Force is a vector; Transmissibility of a force and vector algebra. **CO2:** To explain equilibrium of forces and frictions. **CO3:** To demonstrate the knowledge about distributed force, moment of inertia, stress and strains. **CO4:** To compare dynamics and kinetics of particles.

Department	Basic Science & Humanities (CSE)
Course Code	PH-191
Title of Course	Physics-I Laboratory
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1**: Ability to understand the general property of matters like viscosity, Young's Modulus and Modulus of Rigidity.

	CO2: Ability to know optical property. **CO3**: Ability to learn electrical property. **CO4**: Ability to understand thermal conductivity

Department	EE &ECE(CSE)
Course Code	ES191
Title of Course	Basic Electrical & Electronics Engineering – 1
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1:** To perform experiments on Characteristics of Fluorescent lamps, Tungsten and Carbon filament lamps. **CO2:** To verify Thevenin's theorem, Norton's theorems, Maximum power theorem, Superposition theorem. **CO3:** To Perform study of R-L-C series and parallel circuit.

Department	ME(CSE)
Course Code	ME192
Title of Course	Workshop Practice
Nature of Course	Compulsory
Type of Course	Lecture+Practical
Contact Hours	1L+3P
Total Contact Hours	54
Course Out Come	**CO1:** To perform study on the applications of different engineering materials and manufacturing processes. **CO2:** To get hands on experience on forming/shaping from liquid to solid casting, joining process and removal process.

Department	Basic Science & Humanities (CSE)
Course Code	HU181
Title of Course	**Language Laboratory**
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	2P
Total Contact Hours	19
Course Out Come	**CO1**:Ability to develop skills of Technical Communication in English through Language Lab. Practice Sessions. **CO2**: Ability to communicate confidently and competently in English Language in all spheres.

Department	Basic Science & Humanities (CSE)
Course Code	XC181
Title of Course	**Extra Curricular Activities (NSS/NCC/NSO etc)**
Nature of Course	Compulsory

Type of Course	Practical
Contact Hours	2P
Total Contact Hours	
Course Out Come	**CO1**: Ability to develop awareness in social issues. **CO2**: Ability to participate in mass education programmes. **CO3**: Ability to learn prepare proposal for local slum area development. **CO4**: Ability to develop environmental awareness & Waste disposal. **CO5**: Ability to accustom with relief & rehabilitation work during Natural calamities.

2ND SEM

Department	CSE
Course Code	CS 201
Title of Course	**Basic Computation & Principles of Computer Programming**
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L+1T
Total Contact Hours	42
Course Out Come	**CO1:** To recall, recognize and relate the History and different Generations of Computers; Classify the Computers; describe the Basic Anatomy of Computer Systems including Primary & Secondary Memory, Processing Unit and I/O devices. **CO2:** To define and accordingly apply the Binary & Allied number systems including signed and unsigned numbers; Demonstrate, discriminate and justify the concepts of BCD & ASCII, Binary Arithmetic & logic gates. **CO3:** To explain the basic concepts of computer programming; Represent real life problems in terms of C programs and accordingly solve them. **CO4:** To write C programs for developing basic applications viz. inventory management system, billing systems etc. and basic games viz. snake-ladder, tick-tack-toe etc. **CO5:** To illustrate some system level programming like batch programming, registry programming etc.

Department	Basic Science & Humanities (CSE)
Course Code	CH-201
Title of Course	Chemistry-1
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L + 1T
Total Contact Hours	33
Course Out Come	**CO1**: Ability to apply concept of Chemical Thermodynamic system with associated laws. **CO2**: Ability to understand Reaction Dynamics & Solid state Chemistry for detection of defects in metals and role of

	semiconductor. **CO3**: Ability to understand Electrochemistry, Structure and reactivity of Organic molecule **CO4**: Ability to understand the Industrial Chemistry and its applicability

Department	Basic Science & Humanities (CSE)
Course Code	M-201
Title of Course	Mathematics –II
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L + 1T
Total Contact Hours	40
Course Out Come	**CO1**: Ability to learn Ordinary differential equations with higher order and first degree. **CO2**: Ability to learn Basics of Graph Theory which are useful in the Study of Circuit theory. **CO3**: Ability to learn Laplace Transform which is useful in the study of communication systems.

Department	ECE&EE(CSE)
Course Code	ES201
Title of Course	**Basic Electrical & Electronic Engineering – 2**
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L + 1T
Total Contact Hours	23
Course Out Come	**CO1:** To explain the concept of electrostatics and its various properties. **CO2:** To elaborate the concept of DC machines, single phase transformers, 3-phase induction motors and 3-phase systems. **CO3:** To be familiarized with general structure of electrical power system.

Department	ME(CSE)
Course Code	ME201
Title of Course	**Engineering Thermodynamics & Fluid Mechanics**
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L + 1T
Total Contact Hours	48
Course Out Come	**CO1:** To distinguish the different Gate isolation techniques; draw and explain the I-V characteristics of FETs; appreciate the utility of CMOS. **CO2:** To analyze the different OPAMP circuits and apply the knowledge of network theory to OPAMP circuits. **CO3:** To acquire the proficiency to express binary numbers, convert

	binary to decimal and vice versa, draw truth tables for different logic operations, design Gates and simple digital circuits using the Gates.

Department	CSE
Course Code	CS-291
Title of Course	**Basic Computation & Principles of Computer Programming Lab**
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1:** To operate on DOS, UNIX with preliminary commands. **CO2:** To write and execute C programs for solving basic problems viz. prime number generations, computing GCD or LCM etc. **CO3:** To develop real life applications viz. inventory management system, billing systems etc. through C programming.

Department	Basic Science & Humanities (CSE)
Course Code	CH-291
Title of Course	Chemistry-1 Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1**: Ability to apply concept of Solvent Extraction Procedure **CO2**: Ability to understand Ph metric and conductometric method of determination for acidity and alkalinity of a solution **CO3**: Ability to understand various parameter for the water analysis **CO4**: Ability to understand the viscometric method for determination of solution.

Department	EE &ECE(CSE)
Course Code	ES291
Title of Course	Basic Electrical & Electronics Engineering Lab – 2
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1:** To study I-V characteristics of Field Effect Transistors. **CO2:** To determine input-offset voltage, input bias current and Slew rate of OPAMPs and Common-mode Rejection ratio, Bandwidth and Off-set null of OPAMPs. **CO3:** To conduct study on OPAMP circuits, logic gates and Characteristic curves for CB, CE and CC mode transistors.

Department	ME(CSE)
Course Code	ME292
Title of Course	**Basic Engineering Drawing & Computer Graphics**
Nature of Course	Compulsory
Type of Course	Lecture + Practical
Contact Hours	1L+3P
Total Contact Hours	48
Course Out Come	**CO1:** To draw lines, lettering, dimensioning and scaling. **CO2:** To demonstrate the projection of lines, points, surfaces and solids. **CO3:** To draw isometric view of simple solid objects, full and half sectional views of solids. **CO4:** To design surfaces and computer aided drafting.

3RD SEM

Department	Basic Science & Humanities (CSE)
Course Code	HU-301
Title of Course	**Values & Ethics in Profession**
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L
Total Contact Hours	
Course Out Come	**CO1**: Ability to understand effects of Technological Growth with its limitation. **CO2**: Ability to learn ethics of Profession in Engineering field. **CO3**: Ability to understand Profession and recognize Human Values.

Department	Basic Science & Humanities (CSE)
Course Code	PH-301
Title of Course	**Physics-2**
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L+1T
Total Contact Hours	39
Course Out Come	**CO1**: Ability to understand Vector Calculus. **CO2**: Ability to understand Electrostatic field, dielectric concept, Magnetostatics & TimeVarying Field. **CO3**: Ability to learn Electromagnetic Theory, Quantum Mechanics & Statistical Mechanics

Department	Basic Science & Humanities (CSE)
Course Code	CH-301
Title of Course	**Basic Environmental Engineering & Elementary Biology**
Nature of Course	Compulsory

Type of Course	Lecture
Contact Hours	3L
Total Contact Hours	37
Course Out Come	**CO1**: Ability to understand Basic ideas of environment, Ecology. **CO2**: Ability to learn Air, Water, Land, & Noise pollution and control. **CO3**: Ability to gain knowledge about the Environmental Management which includes Environmental impact assessment, Environmental Audit, laws and protection act of India, Different international environmental treaty/agreement/ protocol.

Department	ECE(CSE)
Course Code	CS301
Title of Course	Analog & Digital Electronics
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L
Total Contact Hours	36
Course Outcome	**CO1:** To compare the merits and demerits of the different amplifies, bias the transistors accordingly and design multivibrator circuits. **CO2:** To explain the basic functionality of computing system in terms of Boolean logic and design digital logic circuits for any Boolean function. **CO3:** To differentiate between the combinational and sequential circuits and design and analyze simple circuits. **CO4:** To illustrate the techniques of analog for digital-to-analog conversion and vice versa for data transmission. **CO5:** To indicate the basic theory of logic families viz. TTL, ECL, MOS and CMOS.

Department	CSE
Course Code	CS302
Title of Course	Data Structure & Algorithms
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L+1T
Total Contact Hours	40
Course Outcome	**CO1:** To recognize and represent different storage structures in the form of various data structures to represent and solve complex real life problems. **CO2:** To illustrate and compare various notations of computational complexities of various algorithms. **CO3:** To compute the time and space complexities of various algorithms. **CO4:** To implement suitable data structures in different problem solving algorithms such that the computational complexity is minimum.

	CO5: To illustrate and compare various searching and sorting problems.

Department	CSE
Course Code	CS303
Title of Course	Computer Organisation
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L+1T
Total Contact Hours	36
Course Outcome	**CO1:** To elaborate the basic structure and principles of underlying organization of any fundamental computing system. **CO2:** To illustrate and summarize how different functional units of computing system like ALU, CU, Memory and I/O are integrated to perform different computational tasks. **CO3:** To explain how different arithmetic and logical operations are performed in CPU. **CO4:** To illustrate and evaluate the various functional areas of basic computing systems to speed up the processing and data transfer. **CO5:** To recognize and hypothetically design advanced architecture of computing systems.

Department	Basic Science & Humanities (CSE)
Course Code	PH-391
Title of Course	Physics-2 Laboratory
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1**: Ability to understand Lande g factor of electron, specific charge of electron and energy band gap of semiconductor. **CO2**: Ability to study Hall effect of semiconductors and characteristics of solar photovoltaic cell.

Department	ECE(CSE)
Course Code	CS391
Title of Course	Analog & Digital Electronics Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1:** To design and operate Class-A Amplifier, Phase-Shift Oscillator and Schmitt Trigger. **CO2:** To design and operate different combinational and sequential circuits.

Department	CSE
Course Code	CS 392
Title of Course	Data Structure & Algorithm Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1:** To develop programming skills on designing and implementing various data structures and polynomials. **CO2:** To write and execute C programs for implementing expression tree, binary search tree and AVL trees. **CO3:** To implement sorting, searching and hashing for solving real life problems.

Department	CSE
Course Code	CS 393
Title of Course	Computer Organisation Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Out Come	**CO1:** To recognize IC chips and perform experiments on decoders, encoders, adders / subtractors and comparators. **CO2:** To design combinational circuits. **CO3:** To use ALU chips for different arithmetic operations. **CO4:** To implement read / write operations using RAM IC.

4TH SEM

Department	CSE
Course Code	M(CS)401
Title of the Course	Numerical Methods
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	2L+1T
Total Contact Hours	25
Course Outcomes	**CO1**: Ability to understand numerical computation & Interpolation. **CO2**: Ability to learn Numerical integration & solution of linear equations. **CO3**: Ability to solve Numerical solution of Algebraic & differential equation.

Department	Basic Science & Humanities (CSE)

Course Code	M401
Title of the Course	Mathematics 3
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L+1T
Total Contact Hours	48
Course Outcomes	**CO1:** To implement the concept of probability and sampling theory in real life problem solving. **CO2:** To acquire skills for estimating parameters and testing of hypothesis. **CO3:** To be exposed with the basic features of advanced graph theory and algebraic structures.

Department	ECE(CSE)
Course Code	CS401
Title of the Course	**Communication Engineering & Coding Theory**
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	2L
Total Contact Hours	32
Course Outcomes	**CO1:** To recognize and illustrate the basic concepts Analog Modulation & Demodulation, Noise, SNR Analog-to-digital conversion and other elements of Communication system. **CO2:** To elaborate the basics of digital transmission and different modulation and demodulation techniques. **CO3:** To explain the information theory and employ and estimate different coding techniques.

Department	CSE
Course Code	CS402
Title of the Course	Formal Language & Automata Theory
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L+1T
Total Contact Hours	36
Course Outcomes	**CO1:** To analyze the basics of finite automata and its applications. **CO2:** To summarize and employ the basic Mealy and Moore machines to solve

	real life problems. **CO3:** To recognize and elaborate the importance of finite automata in designing compilers. **CO4:** To develop finite automata for regular languages. **CO5:** To apply the knowledge of regular grammar and regular languages in natural language processing. **CO6:** To illustrate the basic structure of Turing machine and its limitations.

Department	CSE
Course Code	CS403
Title of the Course	Computer Architecture
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L+1T
Total Contact Hours	38
Course Outcomes	**CO1:** To illustrate the importance of pipelining systems to improve throughputs and the speed of computer processing. **CO2:** To explain the basic structure of multiprocessors and multicore systems. **CO3:** To elaborate the memory management (primary and secondary) towards achieving the computational goals. **CO4:** To demonstrate the basic concept of Non-Von-Newman architecture and its applications. **CO5:** To indicate the basic areas of computer architecture for further improvement of computational speed and reliability. **CO6:** To justify the role of system administrator for better utilization of computer resources.

Department	Basic Science & Humanities(CSE)
Course Code	HU-481
Title of the Course	**Technical Report Writing & Language Lab Practice**

Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	38
Course Outcomes	**CO1**. Ability to inculcate a sense of confidence in the students. **CO2**. Ability to help them become good communicators both socially and professionally. **CO3**. To assist them to enhance their power of Technical Communication.

Department	CSE
Course Code	M(CS)-491
Title of the Course	Numerical Methods Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	2P
Total Contact Hours	20
Course Outcomes	**CO1**:Ability to understand numerical computation & Interpolation. **CO2**: Ability to learn Numerical integration & solution of linear equations. **CO3**: Ability to get Numerical solution of Algebraic & differential equation.

Department	ECE(CSE)
Course Code	CS-491
Title of the Course	**Communication Engineering & Coding Theory**
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	32
Course Outcomes	**CO1:** To generate and recognize AM, FM, PAM, PWM and PPM. **CO2:** To implement different modulation techniques.
Department	CSE
Course Code	CS-492
Title of the Course	Software Tools
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	36

Course Outcomes	**CO1:** To write programs in Visual Basic **CO2:** To program with data, ODBC data base connectivity. **CO3:** To develop applications viz. Patient information system, Library circulation management system etc., including relevant form design with the help of Visual Basic.

Department	CSE
Course Code	CS-493
Title of the Course	Computer Architecture Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To demonstrate, sketch and asses the basics of digital logic base programming with Hardware Description Language. **CO2:** To implement different arithmetic and logic operations. **CO3:** To Formulate and operate 8-bit Addition, Multiplication and Division. **CO4:** To design simple 8-bit Register, 8-bit ALUs and 8-bit CPUs. **CO5:** To develop Interfacing of CPU and Memory.

5TH SEM

Department	Basic Science & Humanities (CSE)
Course Code	HU-501
Title of Course	Economics for Engineers
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L
Total Contact Hours	36
Course Out Come	**CO1**: Ability to understand Economic Decisions Making and considering that students will learn to find out Engineering Costs & Estimation. **CO2**: Ability to learn Cash Flow and also able to calculate Rate of Return Analysis. **CO3**: Ability to know Inflation and Price Change, Present Worth Analysis.

	CO4: Ability to learn depreciation and able to analysis the requirement of replacement.

Department	CSE
Course Code	CS501
Title of the Course	Design and Analysis of Algorithms
Nature of Course	Compulsory
Type of Course	Lecture
Contact Hours	3L+1T
Total Contact Hours	36
Course Outcomes	**CO1:** To relate suitable algorithms with real-life computational problems. **CO2:** To design efficient algorithms for various real life computational problems. **CO3:** To analyze computational complexities of algorithms and compare the complexities of various similar types of algorithms in terms of time and space. **CO4:** To implement various algorithm design techniques and indicate appropriate design approaches for given algorithmic problems. **CO5:** To identify various NP-complete problems and suggesting suitable non-conventional algorithms.

Department	ECE(CSE)
Course Code	CS502
Title of the Course	**Microprocessors & Microcontrollers**
Nature of Course	LECTURE
Type of Course	COMPULSORY
Contact Hours	3L+1T
Total Contact Hours	36
Course Outcomes	**CO1:** To illustrate the hardware details of 8085 microprocessor with the related signals and their implications. **CO2:** To program and interface 8085 microprocessor. **CO3:** To explain the basic structure and operations of 8086 microprocessor and differentiate with that of 8085 microprocessor. **CO4:** To elaborate the 8051 architecture and its programming. **CO5:** To discuss on the basics of PIC microcontroller (16F877)

Department	Basic Science& Humanities(CSE)
Course Code	CS503
Title of the Course	Discrete Mathematics
Nature of Course	LECTURE
Type of Course	COMPULSORY
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To illustrate the concepts and properties of propositional calculus and theory of numbers. **CO2:** To indicate and explain different counting techniques. **CO3:** To implement graph coloring in real life problem solving.

Department	ECE(CSE)
Course Code	**CS504A**
Title of the Course	**Circuit Theory & Network (ECE)**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	42
Course Outcomes	**CO1:** To illustrate Resonant circuits, mesh current network analysis, node voltage network analysis and network theorems. **CO2:** To explain graph of networks and its application. **CO3:** To illustrate the Laplace transform and its importance in real life problem solving.

Department	ECE(CSE)
Course Code	**CS504B**
Title of the Course	**Data Communication (ECE)**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	33
Course Outcomes	**CO1:** To demonstrate the principles of communication techniques in data networks and the Internet. **CO2:** To recognize the different internetworking devices and their functions. **CO3:** To illustrate the role of protocols in

	networking and implement the protocols. **CO4:** To analyze the services and features of the various layers of data networks. **CO5:** To elaborate communication protocols and security protocols in data communication.

Department	ECE(CSE)
Course Code	**CS504C**
Title of the Course	**Digital Signal Processing (ECE)**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	32
Course Outcomes	**CO1:** To discuss about discrete time signals and LTI systems. **CO2:** To illustrate the application of Z-transform, Discrete Fourier transforms and fast Fourier Transform. **CO3:** To indicate the design and implementation of filters. **CO4:** To generalize Digital Signal Processors and differentiate between ASIC and FPGA.

Department	CSE
Course Code	**CS504D**
Title of the Course	**Object Oriented Programming (IT)**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	58
Course Outcomes	**CO1:** To elaborate the basic concepts of object oriented programming and its advantage over other approaches of programming. **CO2:** To discuss the basic characteristics of object oriented programming in relation with some real life applications. **CO3:** To recognize the platform independencies of Java and its advantage over other object oriented programming languages. **CO4:** To develop basic softwares like Payroll Management Systems, Online

	Reservation Systems etc. using Java. **CO5:** To use Java applets in web designing. **CO6:** To create some gaming software using Java, that can run on any web browser.

Department	CSE
Course Code	CS591
Title of the Course	Design & Analysis Algorithm Lab
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To write programs for solving different real-life problems using Divide and Conquer, Dynamic Programming strategies. **CO2:** To use Branch and Bound, Greedy method and backtracking in various problem solving algorithms and program accordingly. **CO3:** To design and employ of various graph traversal algorithms.

Department	CSE
Course Code	CS592
Title of the Course	**Microprocessors & Microcontrollers**
Nature of Course	Compulsory
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To execute assembly language programs for 8085. **CO2:** To interface various peripheral devices with the processor. **CO3:** To write program for control application using 8051 microcontrollers.

Department	CSE
Course Code	CS593
Title of the Course	**Programming Practices using C++**
Nature of Course	Compulsory
Type of Course	Lecture+Practical
Contact Hours	1L+2P
Total Contact Hours	30

Course Outcomes	**CO1:** To write and execute C++ programs towards the solution of basic as well as advanced engineering problems. **CO2:** To develop C++ programs using inheritance, polymorphism, data hiding etc. **CO3:** To design C++ programs using exception handling and file handling.

Department	CSE
Course Code	CS594A
Title of the Course	**Circuit Theory & Network (ECE) Lab**
Nature of Course	ELECTIVE
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To identify different characteristics of Series & Parallel Resonant circuits, Transient Response in R-L & R-C Networks, Transient Response in RLC Series & Parallel Circuits & Networks. **CO2:** To determine Impedance (Z), and Admittance (Y) parameters of two-port networks. **CO3:** To generate periodic, exponential, sinusoidal, damped sinusoidal, step, impulse, and ramp signals using MATLAB.

Department	CSE
Course Code	CS594B
Title of the Course	**Data Communication (ECE) Lab**
Nature of Course	ELECTIVE
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To indicate the basic functions of different types of transmission media. **CO2:** To familiarize Networking cables (CAT5, UTP), Connectors (RJ45, T-connector), Hubs, Switches. **CO3:** To conduct experiments using LAN Trainer Kit.

Department	CSE
Course Code	CS594C

Title of the Course	**Digital Signal Processing (ECE) Lab**
Nature of Course	ELECTIVE
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To perform different simulations using standard simulator. **CO2:** To execute different small programs using either 5416 or 6713 Processor and Xilinx FPGA.

Department	CSE
Course Code	CS594D
Title of the Course	**Object Oriented Programming (IT) Lab**
Nature of Course	ELECTIVE
Type of Course	Practical
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To write and execute Object Oriented Programs to solve simple engineering problems. **CO2:** To developing programs using interfaces, polymorphism etc. **CO3:** To conduct experiments on multi-threaded programming, event-driven and concurrent programming.

6TH SEM

Department	CSE
Course Code	HU601
Title of the Course	**Principles of Management**
Nature of Course	LECTURE
Type of Course	COMPULSORY
Contact Hours	2L
Total Contact Hours	36
Course Outcomes	**CO1**: Ability to know the basic concepts of management, function of management including Planning, Society and People Management. **CO2**: Ability to know the Leadership quality; Decision making, Economic, Financial &Quantitative Analysis. **CO3**: Ability to understand Customer Management, Operations & Technology Management

Department	CSE
Course Code	CS601
Title of the Course	Database Management Systems
Nature of Course	LECTURE
Type of Course	COMPULSORY
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To illustrate the importance of database management systems in maintaining huge data. **CO2:** To summarize the steps of configuration of the back end database like Oracle for high-end software. **CO3:** To indicate the different threats and limitations of existing DBMS and relate suitable approaches to overcome them. **CO4:** To handle high-end databases with the help of different query languages like SQL. **CO5:** To demonstrate the role and responsibilities of database administrator of any organization.

Department	CSE
Course Code	CS602
Title of the Course	Computer Networks
Nature of Course	LECTURE
Type of Course	COMPULSORY
Contact Hours	3L
Total Contact Hours	47
Course Outcomes	**CO1:** To illustrate the basic structure and characteristics of computer networks in connection with standard OSI and TCP/IP model. **CO2:** To recognize various modes of data communication and their applications. **CO3:** To indicate different threats and limitations of various communication protocols and justify ideas to reduce those threats. **CO4:** To evaluate various new protocols for secured and reliable data communication. **CO5:** To summarize various modern techniques of data communication like wireless communications. **CO6:** To elaborate and justify the role of

	cryptography in network security. **CO7:** To demonstrate the role and responsibilities of network administrator in network configuration for any new organization or in maintaining existing networks.

Department	CSE
Course Code	CS603
Title of the Course	Operating System
Nature of Course	LECTURE
Type of Course	COMPULSORY
Contact Hours	3L
Total Contact Hours	47
Course Outcomes	**CO1:** To indicate the basic concept of operating system and its various responsibilities in developing high-end computing systems. **CO2:** To estimate the role of operating system in modern technology other than desktop computers. **CO3:** To illustrate how operating systems plays important role in managing various computational resources and propose suitable approaches in solving existing limitations. **CO4:** To discuss the advantage of open source operating systems over others. **CO5:** To employ the concept of shell programming for significant modification to open source operating systems like Linux.

Department	CSE
Course Code	CS604A
Title of the Course	**Information Theory & Coding**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	47
Course Outcomes	**CO1:** To illustrate the basic concepts of source encoding and channel encoding. **CO2:** To explain the basic concepts of coding for error detection and

	correction. **CO3:** To elaborate the cyclic, BCH and convolution codes.

Department	CSE
Course Code	CS604B
Title of the Course	**Computer Graphics**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	47
Course Outcomes	**CO1:** To elaborate the representation of graphics in the form of picture elements or picture coordinates in computers. **CO2:** To illustrate how graphics are created and updated with the help of some preliminary algorithms. **CO3:** To explain the concept of image transformation and translation to satisfy some image related problems. **CO4:** To discuss on the basics of 2d and 3d transformations and their underlying relations. **CO5:** To enlighten on the approaches towards overcoming the limitations of basic drawing algorithms, translation and transformation techniques.

Department	CSE
Course Code	CS604C
Title of the Course	ERP
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	47
Course Outcomes	**CO1:** To discuss o the evolution of ERP system and business processes supported by it. **CO2:** To explain the relation between IT and ERP systems. **CO3:** To illustrate the implementation of ERP systems. **CO4:** To indicate the emerging trends and future of ERP systems.

Department	CSE

Course Code	CS605A
Title of the Course	Operation Research
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	47
Course Outcomes	**CO1:** To solve different linear programming problems (LPP). **CO2:** To discuss on the Network Analysis and Inventory control. **CO3:** To Familiarize the Game Theory and Queuing Theory.

Department	CSE
Course Code	CS605B
Title of the Course	**Human Resource Management (HSS)**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	47
Course Outcomes	**CO1:** To illustrate the roles and functions of the HR. **CO2:** To discuss on different HR planning strategies. **CO3:** To indicate the importance of training and development and performance management system.

Department	CSE
Course Code	CS605C
Title of the Course	Multimedia Technology(IT)
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	47
Course Outcomes	**CO1:** To discuss on various aspects of multimedia technology and its application. **CO2:** To demonstrate different multimedia applications developed using Text, Audio, Image and Video. **CO3:** To illustrate different multimedia storage models and access techniques. **CO4:** To explain the basics of image and video databases.

Department	CSE

Course Code	CS691
Title of the Course	Database Management System Lab
Nature of Course	PRACTICAL
Type of Course	COMPULSORY
Contact Hours	3P
Total Contact Hours	32
Course Outcomes	**CO1:** To create database, perform basic operation like insertion, deletion, and updation. **CO2:** To retrieve data from the database through query languages like SQL. **CO3:** To configure a database at the background of a high level program using front end tools and forms.

Department	CSE
Course Code	CS692
Title of the Course	Computer Networking Lab
Nature of Course	PRACTICAL
Type of Course	COMPULSORY
Contact Hours	3P
Total Contact Hours	32
Course Outcomes	**CO1:** To write socket programming for UDP, TCP and sliding window protocols. **CO2:** To conduct experiments on simulators for MAC and routing protocols. **CO3:** To implement data link layer flow control and error control mechanisms.

Department	CSE
Course Code	CS693
Title of the Course	Operating System Lab
Nature of Course	PRACTICAL
Type of Course	COMPULSORY
Contact Hours	3P
Total Contact Hours	32
Course Outcomes	**CO1:** To operate on UNIX / Linux operating system with various shell commands, including different kernel level activities. **CO2:** To handle and synchronize processes and threads, with and without interrupts. **CO3:** To employ the concept of pipes for improving the efficiency of an operating system in terms of speed up

	and throughput.

Department	CSE
Course Code	CS681
Title of the Course	Seminar
Nature of Course	SESSIONAL
Type of Course	COMPULSORY
Contact Hours	3P
Total Contact Hours	32
Course Outcomes	**CO1:** To identify various real world problems. **CO2:** To develop and enhance leadership skills. **CO3:** To improving communication skills, presentation skills and other soft skills.

7TH SEM

Department	CSE
Course Code	CS701
Title of the Course	Software Engineering
Nature of Course	LECTURE
Type of Course	COMPULSORY
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To illustrate different phases of developing high-end software in an industry. **CO2:** To recognize different techniques of software testing, reusability of software and software maintenance. **CO3:** To identify different challenges in maintaining or updating old software. **CO4:** To justify the strategies for testing, reusability etc. to reduce cost of development and / or maintenance. **CO5:** To demonstrate the role and responsibilities of software engineers in various phases of software development.

Department	CSE
Course Code	CS702
Title of the Course	Compiler Design
Nature of Course	LECTURE

Type of Course	COMPULSORY
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To illustrate the basic concept of compilers and discuss on the components as well as the strengths and weaknesses of various phases of designing a compiler. **CO2:** To formulate the theories of creating simple compilers using C programming languages. **CO3:** To design and analyze algorithms for syntactic and semantic analysis of the process of designing compilers. **CO4:** To explain the role of finite automata in compiler design.

Department	CSE
Course Code	CS703A
Title of the Course	Pattern Recognition
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To explain the concept of pattern recognition and its different phases. **CO2:** To discuss on the idea of feature extraction and different approaches towards prototype selection. **CO3:** To illustrate the Support Vector Machine and its application in real life problem solving.

Department	CSE
Course Code	CS703B
Title of the Course	Soft Computing
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To explain the fuzzy sets, fuzzy logic systems and its various applications in real life problem solving. **CO2:** To illustrate the concept of Artificial Neural Network and its applications. **CO3:** To discuss on the concept of Genetic Algorithm and its various applications.

	CO4: To elaborate the basics of Simulated Annealing, Tabu search, Ant colony optimization (ACO), Particle Swarm Optimization (PSO).

Department	CSE
Course Code	CS703C
Title of the Course	Artificial Intelligence
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	38
Course Outcomes	**CO1:** To indicate the limitation of conventional computational approaches and the advantage of Artificial Intelligence in complex real life problem solving. **CO2:** To discuss on the strategies for various shortest path problems, optimization problems, machine learning problems and various well known gaming problems like chess, missionaries and cannibal problems, tick-tack-toe problems, etc. **CO3:** To illustrate the functionalities and working model of various high end AI systems like robotics, expert systems, etc. **CO4:** To recognize the limitation of AI in contributing in the roadmap of future strategically development in various AI related fields.

Department	CSE
Course Code	CS703D
Title of the Course	Image Processing
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	38
Course Outcomes	**CO1:** To discuss on the basics of digital image processing and digital image formation. **CO2:** To illustrate different mathematical preliminaries to deal with digital image processing. **CO3:** To explain the concept of Image restoration and image segmentation.

Department	CSE
Course Code	CS704A
Title of the Course	Distributed Operating System
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To explain the basic idea about distributed system and distributed operating system structures. **CO2:** To illustrate the communication in distributed systems, Distributed Mutual Exclusion, Distributed Deadlock Detection. **CO3:** To elaborate different concepts of protection and security in distributed systems, Distributed file systems, Distributed Shared Memory.

Department	CSE
Course Code	CS704B
Title of the Course	Cloud Computing
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To explain the basics of cloud computing and its architecture. **CO2:** To illustrate the use of different platforms in cloud computing. **CO3:** To elaborate the infrastructure and cloud security. **CO4:** To explain the basic concepts of services and applications.

Department	CSE
Course Code	CS704C
Title of the Course	**Data Warehousing and Data Mining**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To discuss about data warehouse and how to build it. **CO2:** To provide details about storing data and generating reports.

	CO3: To retrieve the data from the data ware house. **CO4:** To classify the data and predict the unknown data. **CO5:** To illustrate basic information about the cluster of data.

Department	CSE
Course Code	CS704D
Title of the Course	Sensor Networks
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	40
Course Outcomes	**CO1:** To provide an overview about sensor networks and emerging technologies. **CO2:** To discuss about the node and network architecture of sensor nodes and its execution environment. **CO3:** To illustrate the concepts of communication, MAC, routing protocols and also study about the naming and addressing in WSN. **CO4:** To discuss about topology control and clustering in networks with timing synchronization for localization services with sensor tasking and control. **CO5:** To elaborate sensor node hardware and software platforms and understand the simulation and programming techniques.

Department	CSE
Course Code	CS704E
Title of the Course	Mobile Computing
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	39
Course Outcomes	**CO1:** To design and implement mobile applications to realize location-aware computing. **CO2:** To administrate and maintain a wireless LAN. **CO3:** To design algorithms for location estimation based on different routing techniques.

	CO4: To develop mobile computing applications by analyzing their properties and requirements, selecting the appropriate computing models and software architectures, and applying standard programming languages and tools.

Department	CSE
Course Code	CS705A
Title of the Course	Internet Technology
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	34
Course Outcomes	**CO1:** To illustrate the basics of Internet technology and related concepts like WWW, Internet, Intranet, etc. **CO2:** To explain the concept of Email in relation with some application layer protocols like SMTP, POP etc. **CO3:** To indicate different threats in the internet and relate strategies to overcome those threats. **CO4:** To create web pages using HTML, Javascript etc. **CO5:** To explain the basic concepts of search engine, internet telephony etc.

Department	CSE
Course Code	CS705B
Title of the Course	Micro Electronics & VLSI Design(ECE)
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To explain the basics of VLSI design with its features. **CO2:** To illustrate the structure of MOS and its application in VLSI design. **CO3:** To elaborate various micro-electronic processes for VLSI fabrication. **CO4:** To indicate the use of Hardware Description Language for various digital circuit designs.

Department	CSE

Course Code	CS705C
Title of the Course	Control System(EE)
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To explain the basics of various concepts relating to control systems. **CO2:** To illustrate the importance of transfer function and its representations. **CO3:** To indicate the application of time response analysis and frequency response analysis in various problem solving. **CO4:** To elaborate various classical control design techniques.

Department	CSE
Course Code	CS705D
Title of the Course	Modelling & Simulation(M)
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To elaborate the basics of modeling and simulation, its application areas, advantages, disadvantages and pitfalls. **CO2:** To indicate the application of System Dynamics & Probability concepts in Simulation. **CO3:** To discuss about Simulation of Queuing Systems and Discrete System Simulation. **CO4:** To illustrate the concept to analyse different simulation outputs.

Department	CSE
Course Code	HU781
Title of the Course	Group Discussion
Nature of Course	SESSIONAL
Type of Course	COMPULSORY
Contact Hours	3P
Total Contact Hours	
Course Outcomes	**CO1**: Ability to know the current affairs. **CO2**: Ability to grow the presentation skill

	and communication technique using English language. **CO3**: Ability to familiar with team work and acquire the leadership quality

Department	CSE
Course Code	CS791
Title of the Course	Software Engineering Lab
Nature of Course	PRACTICAL
Type of Course	COMPULSORY
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To prepare requirement document for standard application problems in standard format. **CO2:** To prepare project schedules and accordingly generate Gnatt chart and PERT chart. **CO3:** To implement Use Case diagram, Class diagram, Sequence diagram and prepare Software Design Document using tools like Rational Rose. **CO4:** To estimate the project size and design Test script / Test plan. **CO5:** To compute Process and Product Metrics.

Department	CSE
Course Code	CS793A
Title of the Course	Pattern Recognition Lab
Nature of Course	PRACTICAL
Type of Course	ELECTIVE
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To implement efficient algorithms for nearest neighbour classification. **CO2:** To construct decision trees. **CO3:** To implement of Linear Discriminant Function and Support Vector Machines.

Department	CSE
Course Code	CS793B
Title of the Course	Soft Computing Lab
Nature of Course	PRACTICAL
Type of Course	ELECTIVE
Contact Hours	3P

Total Contact Hours	30
Course Outcomes	**CO1:** To solve real life problems using Fuzzy Logics. **CO2:** To design different Artificial Neural Network models for solving real life problems. **CO3:** To represent and solve various real life problems using Genetic Algorithm.

Department	CSE
Course Code	CS793C
Title of the Course	Artificial Intelligence Lab
Nature of Course	PRACTICAL
Type of Course	ELECTIVE
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To represent various reasoning problems using prolog and solving them. **CO2:** To use LISP in expert system design.

Department	CSE
Course Code	CS793D
Title of the Course	Image Processing Lab
Nature of Course	PRACTICAL
Type of Course	ELECTIVE
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To deal with various gray scale and color images. **CO2:** To analyze different images using histogram equalization. **CO3:** To implement various concepts like non-linear filtering, edge detection using operators, 2 D DFT and DCT etc. **CO4:** To apply segmentation using watershed transform.

Department	CSE
Course Code	CS795A
Title of the Course	Internet Technology Lab
Nature of Course	PRACTICAL
Type of Course	ELECTIVE
Contact Hours	3P

Total Contact Hours	30
Course Outcomes	**CO1:** To use the Applet, Java Script and Perl in web design. **CO2:** To write programs for the communication between the client and the server. **CO3:** To create web pages using HTML and XML.

Department	CSE
Course Code	CS795B
Title of the Course	Micro Electronics & VLSI Design(ECE) Lab
Nature of Course	PRACTICAL
Type of Course	ELECTIVE
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	CO1: To explain the basics of VLSI design with its features. CO2: To illustrate the structure of MOS and its application in VLSI design. CO3: To elaborate various micro-electronic processes for VLSI fabrication. CO4: To indicate the use of Hardware Description Language for various digital circuit designs.

Department	CSE
Course Code	CS795C
Title of the Course	Control System Lab(EE)
Nature of Course	PRACTICAL
Type of Course	ELECTIVE
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To familiarize MATLAB Control System tool Box, MATLAB-SIMULINK toolbox & pSPICE. **CO2:** To determine step response for 1st order & 2nd order system with amity feedback on CRO & calculation of control system specifications for variations of system design. **CO3:** To simulate step response & impulse response for Type-I & Type-II system with unity feedback using MATLAB & pSPICE. **CO4:** To determine PI, PD, and PID

	controller action on 1st order simulated process, approximate transfer function experimentally using Bode Plot. **CO5:** To design and implement the hardware architecture of a temperature controller using microprocessor/microcontroller.

Department	CSE
Course Code	CS795D
Title of the Course	Modelling & Simulation Lab(M)
Nature of Course	PRACTICAL
Type of Course	ELECTIVE
Contact Hours	3P
Total Contact Hours	30
Course Outcomes	**CO1:** To simulate CPU scheduling algorithm using queuing system a) FCFS b) SJF c) Priority Algorithm. **CO2:** To simulate congestion control algorithms and disk scheduling algorithms. **CO3:** To simulate Telephone system model and traffic system in computer networks.

Department	CSE
Course Code	CS792
Title of the Course	Industrial Training
Nature of Course	SESSIONAL
Type of Course	COMPULSORY
Contact Hours	
Total Contact Hours	4 Weeks
Course Outcomes	**CO1:** To increase exposure to industries. **CO2:** To be accustomed with working environment in industries. **CO3:** To get the opportunity to work with live projects.

Department	CSE
Course Code	CS794
Title of the Course	Project-1
Nature of Course	SESSIONAL
Type of Course	COMPULSORY
Contact Hours	
Total Contact Hours	1 SEMESTER

Course Outcomes	**CO1:** To conduct survey on the work done in the chosen domain. **CO2:** To formulate the problem out of the survey. **CO3:** To propose some technique towards the solution of the problem defined.

8TH SEM

Department	CSE
Course Code	HU801A
Title of the Course	Organisational Behaviour
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	2L
Total Contact Hours	20
Course Outcomes	**CO1**: Ability to know the fundamental and structure of an organization. **CO2**: Ability to understand organizational behavior. **CO3**: Ability to understand the key elements of a successful organization and also have the knowledge of man power requirement and judge the qualification for proper utilization of manpower.

Department	CSE
Course Code	HU801B
Title of the Course	Project Management
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	2L
Total Contact Hours	24
Course Outcomes	**CO1:** To analyze various concepts project management, project planning and project scheduling. **CO2:** To implement the concept of Time Cost Trade-off Analysis, Resource Allocation and Levelling. **CO3:** To familiarize with project life cycle, project cost and project quality management. **CO4:** To explain the overview of Software Project Characteristics and

	Management and IT in projects.

Department	CSE
Course Code	CS801A
Title of the Course	Advanced Computer Architecture
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	39
Course Outcomes	**CO1:** To distinguish the concepts of Computer Architecture and Organization. **CO2:** To illustrate various Parallel Processing Architectures, Data and Resource Dependencies, Program Partitioning and Scheduling, Control Flow vs. Data Flow. **CO3:** To discuss on the Network topologies, RISC vs. CISC, Memory Hierarchy, and Virtual Memory. **CO4:** To elaborate the concepts of Pipelining, Instruction Pipelining, dynamic pipelining, and arithmetic pipelines. **CO5:** To indicate multiprocessors, vector and array processing principles. **CO6:** To recognize Data Flow Architecture and Parallel Programming Models, Languages, Compilers.

Department	CSE
Course Code	CS801B
Title of the Course	Parallel Computing
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	37
Course Outcomes	**CO1:** To discuss on the parallel computing and its various aspects. **CO2:** To recognize various parallel algorithms. **CO3:** To use of linear systems of equation and sorting. **CO4:** To illustrate various graph algorithms and Parallel Programming Languages.

Department	CSE

Course Code	CS801C
Title of the Course	Natural Language Processing
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	37
Course Outcomes	**CO1:** To recognize the basics of Regular Expressions and Automata. **CO2:** To explain the concept of tokenization, morphology, language modeling, Hidden Markov Models and POS Tagging. **CO3:** To discuss on the text classification and context free grammar. **CO4:** Computational Lexical Semantics and Information Retrieval.

Department	CSE
Course Code	CS801D
Title of the Course	**Cryptography & Network Security**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	38
Course Outcomes	**CO1:** To discuss on various types of attacks and their characteristics. **CO2:** To illustrate the basic concept of encryption and decryption for secure data transmission. **CO3:** To Analyze and compare various cryptography techniques. **CO4:** To explain the concept of digital signature and its applications. **CO5:** Proposing new strategies to secure data communication.
Department	CSE
Course Code	CS801E
Title of the Course	Business Analytics
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	38
Course Outcomes	**CO1:** To discuss on the foundation of Business Analytics, Product-Market fit and Gap analysis. **CO2:** To illustrate the analytical modeling by factor and cluster analysis. **CO3:** To illustrate the analytical modeling

	by logistics regression and discriminant analysis. **CO4:** To discuss on the Segmentation of primary target market by Heuristic modelling and based on large databases using Decision Tree approach.

Department	CSE
Course Code	CS 802A
Title of the Course	Technology Management(HSS)
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** Apply concepts and perspectives on organizational leadership, multi-disciplinary perspectives, and leadership models to actual organizational situations. **CO2:** Apply relevant principles on the design of computer-based information systems to increase organizational effectiveness and efficiency in the development and implementation of organizational strategy and the control and evaluation of organizational activities. **CO3:** Demonstrate necessary skills to resolving conflict by applying conflict analysis models, tools and processes. **CO4:** Demonstrate competency in the application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements. **CO5:** Demonstrate competency in the application of knowledge, skills, techniques, and tools in the domain of information technology security.

Department	CSE
Course Code	CS802B

Title of the Course	**Cyber Law & Security Policy (HSS)**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	32
Course Outcomes	**CO1:** To indicate the basics of cybercrime and its various categories. **CO2:** To discuss about cybercrime in mobile and wireless devices. **CO3:** To illustrate different tools and methods used in cybercrime. **CO4:** To elaborate the concepts of phishing and identity theft, cybercrime and cyber security.

Department	CSE
Course Code	CS802C
Title of the Course	Optical Networking(ECE)
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36
Course Outcomes	**CO1:** To illustrate the concepts of optical communications, switching in networks, transmission, layering in packet switched network and circuit switched network. **CO2:** To discuss about data plane, management plane, control plane, different components, multiplexing techniques. **CO3:** To elaborate different protocols for single channel broadcast network, Classification of multiple access methods, Multichannel multiple access protocols. **CO4:** To explain the basics of IP over optical framework, protection and restoration.

Department	CSE
Course Code	CS802D
Title of the Course	**Low Power Circuits & Systems (ECE)**
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	36

Course Outcomes	**CO1:** To explain the basics of MOS circuits and sources of power dissipation. **CO2:** To discuss about supply voltage scaling approaches, Switched Capacitance Minimization Approaches and Leakage Power minimization Approaches. **CO3:** To illustrate other special topics like Adiabatic Switching Circuits, Battery-aware Synthesis, Variation tolerant design.

Department	CSE
Course Code	CS802E
Title of the Course	E-Commerce(IT)
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	39
Course Outcomes	**CO1:** To elaborate the basics of e-commerce and its various applications. **CO2:** To illustrate the concepts of business to business e-commerce and its various aspects. **CO3:** To discuss about various legal and security issues. **CO4:** To elaborate the idea of e-business.

Department	CSE
Course Code	CS802F
Title of the Course	Robotics(EE & ME)
Nature of Course	LECTURE
Type of Course	ELECTIVE
Contact Hours	3L
Total Contact Hours	43
Course Outcomes	**CO1:** To illustrate the basics of robotics, its components and various applications. **CO2:** To discuss about kinematics of serial and parallel robots. **CO3:** To elaborate velocity and static analysis of robot manipulators, Dynamics of serial and parallel manipulators. **CO4:** To explain the concept of motion planning and control, Modelling and control of flexible robots, Modelling and analysis of wheeled mobile

	robots.

Department	CSE
Course Code	CS891
Title of the Course	**Design Lab / Industrial problem related practical training**
Nature of Course	PRACTICAL
Type of Course	COMPULSORY
Contact Hours	6P
Total Contact Hours	36
Course Outcomes	**CO1:** To prepare students industry ready through various spoken tutorials. **CO2:** To learn about industry application of various programming languages like C, C++, Java, PHP and MySQL etc.

Department	CSE
Course Code	CS892
Title of the Course	Project 2
Nature of Course	SESSIONAL
Type of Course	COMPULSORY
Contact Hours	12P
Total Contact Hours	37
Course Outcomes	**CO1:** To apply advanced programming techniques in identified real world problems. **CO2:** To analyze the utilies of solutions. **CO3:** To carry out technical report/thesis writing.

Department	CSE
Course Code	CS893
Title of the Course	Grand Viva
Nature of Course	SESSIONAL
Type of Course	COMPULSORY
Contact Hours	
Total Contact Hours	
Course Outcomes	**CO1:** To evaluate overall technical knowledge and industry readiness. **CO2:** To go under a virtual environment of technical interview. **CO3:** To analyze various application of computer science in real life problem

	solving.