Course Outcome (COs) of CSE Department | Year of study: 2017-18	
Department of Computer Science & Engineering	
MA-101	**Engineering Mathematics-I Year of study: 2017-18**
CO11MA101.1	Students will be able to find asymptotes of various algebraic curves and also skilled to find geometric shape of algebraic and polar curve through the technique of curve tracing.
CO11MA101.2	Students will be able to estimate maxima and minima of multivariable functions using the concept of partial differentiation. Further workout limit, continuity and differentiability of two variable functions.
CO11MA101.3	Learner will be skilled in the technique to evaluate double and triple integration. Further students will be competent to estimate volume and surface area of the solid formed by revolution of different curves. Also workout definite integral through Beta and Gamma functions.
CO11MA101.4	Learner will be able to calculate Gradient, divergence and curl using the concept of vector differentiation. Further workout vector potential and normal, solenoidal, irrotational vector.
CO11MA101.5	Students will be skilled to apply the concept of vector integration to verify vector integral theorems.
HU-101	**Communication Skills Year of study: 2017-18**
CO11HU101.1	Students will be able to understand and develop communication skills and techniques which will felicitate their ability to work
CO11HU101.2	Students will be able to use English grammar accurately that will increase their confidence in English writing and speaking.
CO11HU101.3	Students will be able to invent, draft, organize, abstract, elaborate and synthesize their own and other's ideas in formatted way.
CO11HU101.4	Students will be able to understand literary devices after reading poems and stories and also apprecaite art in all forms.
PY-101	**Engineering Physics Year of study: 2017-18**
CO11PY101.1	Understand the concept of interference to be able to explain the physics behind applications such as anti-reflection coatings,
CO11PY101.2	Understand the phenomena of polarization of light to be able to explain the working of polarimeter, physics of optical activity in
CO11PY101.3	Learn Fraunhoffer's diffraction phenomena in a single slit and appreciate the strength of wave optics to define resolving power of an
CO11PY101.4	Understand the concept of bonding in materials, physics of semiconductors and concept of fermi function and energy
CO11PY101.5	Understand the physics of relativity at high speed and appreciate the relativistic meachanics to explain twin paradox, mass-enregy
CS-101	**Computer Programming-I Year of study: 2017-18**
CO11CS101.1	Students will be able to write algorithms and draw flowcharts for various problems
CO11CS101.2	Students will be able to memorize different data types and operators in C and to write ,compile and debug programs in C language.
CO11CS101.3	Students will be able to design programs involving decision structures and loops in C.
CO11CS101.4	Students will be able to design programs involving functions and various parameters passing techniques.
CO11CS101.5	Students will be able to describe architecture of computer and solve number system problems.
CE-101	**Environmental Engineering and Disaster Management Year of study: 2017-18**
CO11CE101.1	to understand basics of environment with laws and regulations
CO11CE101.2	air and water pollution with its control
CO11CE101.3	to study various types of solid and its management
CO11CE101.4	natural calamities and man made disaster and their recurrence
MA-102	**Engineering Mathematics-II Year of study: 2017-18**
CO12MA102.1	Able to calculate rank of matrix, characteristic equation & characteristic roots & use the applicability of Caylay Hamilton Theorem to find
CO12MA102.2	Students apply the knowledge of Fourier series to express any periodic function into series of sine and cosine and its helps in study of
CO12MA102.3	Students understand various methods to solve ordinary differential equation of first and Higher order. Which place important role in all
CO12MA102.4	Students understand various methods to solve ordinary differential equation of second order with variable coefficient which is useful for
CO12MA102.5	Understands the concepts of solution of linear and non linear PDE. Further students are able to apply general method (Charpit method)
HU-103	**Human Values Year of study: 2017-18**
CO12HU103.1	Students will understand the importance of happiness through identification of human values and skills.
CO12HU103.2	Students will understand the role of basic human aspirations in self and people around them.
CO12HU103.3	Students will understand about the harmony in family, in society and practically understand the importance of trust and respect as
CO12HU103.4	Students will understand the interconnectedness among the four orders of nature, recyclability, coexistance and harmony at all level of
CO12HU103.5	Students will undertand to be prepared for humanistic education, professional competence with ethics and humanistic universal order.
CY-101	**Engineering Chemistry Year of study: 2017-18**
CO12CY101.1	To understand standards of water with system of municipal water supply and commercial method to remove hardness
CO12CY101.2	Study of different types of fuel ,their synthesis and quality standards and analysis of flue gas
CO12CY101.3	detail of polymer ,natural synthetic and vulcanized rubber
CO12CY101.4	identification of the different types of corrosion and preventive methods of corrosion
CO12CY101.5	Recognize and classify the structures of Optical fiber with basic knowledge of inorganic Engg material
CS-103	**Computer Programming-II Year of study: 2017-18**

CO12CS103.1	Students will be able to design an algorithm for the given problem statement.
CO12CS103.2	students will be able to create programs using algorithms.
CO12CS103.3	Students will be able to impliment dynamic memory allocation.
CO12CS103.4	To analyze the problem statement and synthesize necessary programs to address it.
CO12CS103.5	To evaluate different solutions and understand their appropriateness towards a specific problem statement
EE-101	**Basic Electrical and Electronics Engineering Year of study: 2017-18**
CO12EE101.1	Categorize and explain the basic Electrical Theorems and construct Circuits
CO12EE101.2	Summarize the principles of operation of DC machines, single phase transformers and three phase induction motors
CO12EE101.3	Categorize the starting methods of starting synchronous and induction motors and prepare set up for speed control
CO12EE101.4	Design and rearrange simple combinational and sequential logic circuits
CO12EE101.5	Formulate the principle of operation of moving coil, moving iron and dynamometer type instruments
OE-101	**Engineering Mechanics Year of study: 2017-18**
CO12OE101.1	Student will be able to define fundamental laws of Mechanics, identify the Conditions of equilibrium and apply those to solve problems
CO12OE101.1	Student will locate the center of gravity and theorems of Moment ofInertia and apply it to calculate to moment of inertia of various
CO12OE101.1	Student will be able to define friction, laws of friction, power transmission by belt and employ them to solve various applications of
CO12OE101.1	Student will be able to memorize the kinematics and dynamics by using Newton's Laws of motions and use them to solve problems of
CO12OE101.1	Student will be able to understand Introduction to vibrations, Free vibrations of particles, Simple, compound and torsional pendulum,
3CS1A	**Elctronic Devices and Circuits Year of study: 2017-18**
CO231.1	The students will have the knowledge of components of Electronics.
CO231.2	The students will have the ability to analyze various Types of Diodes.
CO231.3	The students will have the ability to analyze various Types of Transistors
CO231.4	The student will be able to analyze and allocate performance objectives to components of Transistors, FET's.
CO231.5	The students will be able to evaluate the performance of small signal amplifiers at low frequency.
3CS2A	**Data Structures and Algorithms Year of study: 2017-18**
CO232.1	Student will be able to design algorithms and convert those algorithms into a C language code to perform push and pop operation on stack data structure. Student also develop an ability to perform recursion and apply them to the tower of Hanoi problem.
CO232.2	Student will be able to design algorithms and convert those algorithms into a C language code to perform enqueu, dequeue and traversing operation on queue and Linked list data structure. Student will also able to list the advantages and disadvantages of Linked List.
CO232.3	Students will be able to write C code to implement Linear search, Binary Search, bubble sort, Insertion sort, selection sort, quick sort, heap sort, merge sort, radix sort and counting sort.
CO232.4	Students will be able to write C programming code to create binary tree and implement pre, post and in order traversing on the tree data structure.
CO232.5	Students will be able to write C programming code to implement Hashing. He should be able to perform breadth and depth first search operations on Graph data structure
3CS3A	**Digital Electronics Year of study: 2017-18**
CO233.1	To understand and examine the structure of various number systems and its application in digital design.
CO233.2	To prepare students to perform the analysis and design of various digital electronic circuits.
CO233.3	Ability to identify basic requirements for a design application and propose a cost effective solution.
CO233.4	The ability to understand, analyze and design various combinational circuits such as adder,subtractor, encoder and decoder.
CO233.5	The ability to understand, analyze and design various sequential circuits such as counter ,FSM and identify timing issues in a that digital
3CS4A	**Linux and Shell Programming Year of study: 2017-18**
CO234.1	To learn to set permission of user, administrator, group.
CO234.2	To learn working with VI Editor and gcc compiler.
CO234.3	To know basic about X-window.
CO234.4	To learn about basic of SHELL and BASH Shell.
CO234.5	To understand about Shell programming.
3CS5A	**Object Oriented Programming Year of study: 2017-18**
CO235.1	Student should be able to write programs using different programming paradigm such as top down and bottom up.
CO235.2	Students shoud be able to write programs using OOPs concept, they should be abble to create classes and to call the properties of classes using objects. They should be able to apply access specifiers on the members of the class.
CO235.3	Students should be able to write C++ code to inherit properties of one class into another. They should be able to apply the concept of virtual functions with espect to multiple inheritance.
CO235.4	Students should be able to write the C++ code for the operator overloading function and can perform overriding of functions.

CO235.5	Student should be able to create dynamic arrays using template programming. Also he will be able to define generic functions who can perform operations on different datatypes.
3CS6A	**Advanced Engineering Mathematics Year of study: 2017-18**
CO236.1	Student understood the optimization method and application in Engineering field.
CO236.2	Student able to formulate real life problem into linear programming problem and transportation problem. Get the best solution which
CO236.3	Student learns about the number theory, algebraic structures (group, field, ring). Its help them in coding theory , cryptography etc.
CO236.4	Student able to solve Laplace transform. It is use to solve ordinary differential equation and partial differential equation.
CO236.5	By using numerical analysis student find the unknown value, function, missing term from a given set of data and solve integration,
4CS1A	**Microprocessors and Interfaces Year of study: 2017-18**
CO241.1	Students are able to list and arrange the various features of microprocessor, memory and I/O devices including concepts of system bus
CO241.2	Students are able to Describe the 8085 processor addressing modes, instruction classification and function of each instruction and write
CO241.3	Students are able to compute time delay in program and able to apply the concept of stack,Subroutine and Interrupt in assembly
CO241.4	Students are able to design and develope the circuit for memory and I/O interfacing with 8085 processor .
CO241.5	Students are able to develope microprocessor based real application such as traffic light controller.
4CS2A	**Discrete Mathematical Structures Year of study: 2017-18**
CO242.1	Fundamental concepts of mathematics: definitions, proofs, sets, functions.
CO242.2	To understand partial orders, relations, Boolean algebra
CO242.3	Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique
CO242.4	Demonstrate different traversal methods for trees and graphs
CO242.5	Write an argument using logical notation and determine if the argument is or is not valid.
4CS3A	**Statistics and Probability Theory Year of study: 2017-18**
CO243.1	Students are understanding to apply concepts of probability and distributions to different problems
CO243.2	Students are able to apply different probability distribution to identify and solve real life problem.
CO243.3	Students are able to analyzing the pair of variable are related or not, and predict the future value by using the regression equations.
CO243.4	Student use the queuing models to developing better management system and providing good services or results in their future life
CO243.5	Students will be able to solve problems and model situations using techniques of Markov process, queuing theory.
4CS4A	**Software Engineering Year of study: 2017-18**
CO244.1	Student will understand fundamental concepts in software engineering, SDLC, software requirements specification, formal
CO244.2	Student will learn about Software Project Management and able to calculate the cost based on line of code.
CO244.3	Student will be able to prepare various documents such as requirement analysis (SRS) and Structured analysis.
CO244.4	Student will learn fundamental software design and Effective modular design.
CO244.5	Student will be able to design UML diagrams for a given requirement specifications.
4CS5A	**Principles of Communication Year of study: 2017-18**
CO245.1	Analyze different type of analog modulation techniques.
CO245.2	Explain various Pulse modulation techniques.
CO245.3	Analyze different type of digital modulation techniques.
CO245.4	Design and develope the encoder pulse shaping techniques such as PAM,PPM,PWM.
CO245.5	Design and develope PN sequence generator for spread-spectrum modulation .
4CS6A	**Principles of Programming Languages Year of study: 2017-18**
CO246.1	To provide an overview of different programming paradigms
CO246.2	Improve the background for choosing appropriate programming languages for certain classes of programming problems
CO246.3	Be able to differentiate programming language among in an imperative (or procedural), an object oriented, a functional, or logical
CO246.4	Analyzing the significance of an implementation of a programming language in a compiler or interpreter
CO246.5	Increase the ability to learn new programming languages
5CS1A	**Computer Architecture Year of study: 2017-18**
CO351.1	Students will be able to understand basic structure of computer.
CO351.2	Students will be able to understand control unit operations, will able to conceptualize instruction level parallelism.
CO351.3	Students will able to perform computer arithmetic operations
CO351.4	Students will be able to design memory organization that uses banks for different word size operations., understand the concept of
CO351.5	Students will be able to understand the concept of I/O organization
5CS2A	**Digital Logic Design Year of study: 2017-18**
CO352.1	Understand the describe the basics of Hardware Description Languages and their use in digital logic design.
CO352.2	Develop the VHDL coding for combinational logic and Sequential circuits

CO352.3	Explain the synchronous Sequential logic circuits, draw the block diagram of Shift Registers
CO352.4	Design and develope of asynchronous and synchronous sequential circuits such as counter, FSM.
CO352.5	Describe the operation of Programmable Logic Devices
5CS3A	**Telecommunication Fundamentals Year of study: 2017-18**
CO353.1	Analyze different transmission terminologies, transmission mediums, line coding schemes, network models and flow control techniques.
CO353.2	Apply different error detection and correction techniques in data transmission.
CO353.3	Acquire knowledge about different wireless standard and switching mechanisms in data link layer.
CO353.4	Explain the different multiplexing & multiple access techniques.
CO353.5	Ability to design and develop PN sequenec encoder for spread spectrum techniques.
5CS4A	**Database Management Systems Year of study: 2017-18**
CO354.1	Students will have a broad understanding of database concepts and database management system software and also have a high-level
CO354.2	Students will be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design
CO354.3	Students will be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
CO354.4	Students will be able to Identify Structure Query Language statements used in creation and manipulation of Database. Students will be
CO354.5	Students will be able to understand the concept of database normalization and students can construct normalized databases for various
5CS5A	**Operating Systems Year of study: 2017-18**
CO355.1	Students will be able to understand principles of operating systems ,design and implementations, Understand the various components
CO355.2	Students will be able to analyzeand apply suitable Process Scheduling Algorithm and Memory Partition Techniques, Apply appropriate
CO355.3	Students will be able to memorize deadlock, Methods for handling deadlocks and memory management strategies
CO355.4	Students will be able to gain the knowledge of memory management algorithm and CPU scheduling techniques. Implement and
CO355.5	Students will be able to understand and memorize various file and disk management strategies.
5CS6.1A	**Advanced Data Structure Year of study: 2017-18**
CO356.1	Ability to understand types of Balanced Trees and their operations.
CO356.2	Ability to understand concepts and operations of Heaps.
CO356.3	Ability to understand graph terminology and its various algorithm to solve engineering problems.
CO356.4	Ability to understand parallel processing using sorter and merger networks.
CO356.5	Ability to understand mathematical theorems used in data structures
6CS1A	**Computer Networks Year of study: 2017-18**
CO361.1	Students will learn how networked computing devices pass data to each other along data connections
CO361.2	Students will learn about types of errors, and error detection & correction methods such as stop and weight, Go-Back-N. They will also
CO361.3	Students will study different routing algorithms. The will be able to apply the concept of sub-netting and derived IPs for subnets.
CO361.4	Student should learn and apply the leaky and token bucket algorithms for traffic shaping.
CO361.5	Student will study different application level protocols such as FTP, SMTP and, HTTP.
6CS2A	**Design and Analysis of Algorithms Year of study: 2017-18**
CO362.1	Students will be able to understand various asymptotic notations, its properties and use in measuring algorithm behavior, learn about
CO362.2	Students will able to apply various algorithms for different computing problems using dynamic programming and branch and bound
CO362.3	Students will be able to design and evaluate algorithms using various algorithm design techniques for pattern matching algorithms.
CO362.4	Students will be able to analyze randomized algorithms, Recite algorithms that employ randomization.
CO362.5	Relate the concepts of NP Completeness for analyze and solving the complexity of real life problems.
6CS3A	**Theory Of Computation Year of study: 2017-18**
CO363.1	Students will be able to analyze and design finite automata also can apply rigorously formal mathematical methods to design automata.
CO363.2	Students will be able to apply formal mathematical methods to prove properties of languages; grammars also analyze and design
CO363.3	Students will be able to develop the ability to apply the ideas about context free grammars, Derivation and ambiguity along the
CO363.4	Students will be able to Construct Turing machine for different problems and argue formally about correctness on different restricted
CO363.5	Students will be able to distinguish different computing languages and classify their respective types.
6CS4A	**Computer Graphics and Multimedia Techniques Year of study: 2017-18**
CO364.1	Students will be able to define the basics of computer graphics, different graphics systems, application of computer graphics and
CO364.2	Students will be able to apply geometric transformations on graphics objects, their application in composite form, different color filling
CO364.3	Students will be able to identify visible surface detection techniques & curves.
CO364.4	Students will be able to render projected objects to naturalize the scene in 2D view and use of illumination models & color models.
CO364.5	Students will be able to identify multimedia components and animation techniques.
6CS5A	**Embedded System Design Year of study: 2017-18**
CO365.1	Suggest design approach and requirements of embedded systems.

CO365.2	Write and develop routines for interrupt programming.
CO365.3	Select the criteria's of designing and implementing a real time embedded system.
CO365.4	Analyse the basics of real time operating systems and different scheduling concepts.
CO365.5	design and develope real time embedded system such as traffic light controller,ON-OFF controller and tested using software
6CS6A	**Advance Topics in Operating Systems Year of study: 2017-18**
C366.1	Develop an ability to understating the main concepts of Concurrency, transactions, multimedia operating systems, real time operating
C366.2	Develop an ability to understand the use of virtualization and cloud technologies
C366.3	Develop an ability to design operating system which supports database transactions, ACID properties and serializability
C366.4	To give an understanding of practical engineering issues in real-time and concurrent systems
C366.5	To discuss limitations of widely-used operating systems, introduce new design approaches to address challenges of security, robustness,
7CS1A	**Cloud Computing Year of study: 2017-18**
CO471.1	Students will be able to understand the fundamentals of cloud computing along with cloud computing design and challenges.
CO471.2	Students will be able to use relevant software tools used in cloud computing. Student will also differentiate between Parallel and
CO471.3	Students will be able to gain the knowledge about virtualization and its needs in cloud computing. Students will be able to use the tools
CO471.4	Students will be able to understand the security issues and recovery methods associated with cloud computing
CO471.5	Students will be able to write case studies on the tools available for industrial purpose to deploy clouds. Students will also develop
7CS2A	**Information System Security Year of study: 2017-18**
CO472.1	Develop a basic understanding of cryptography, how it has evolved and some key encryption techniques used today, Develop an
CO472.2	To master and implement different encryption algorithms
CO472.3	To master fundamentals of secret and public cryptography
CO472.4	Students will be able to understand message authentication protocols and hash functions.
CO472.5	To master protocols for security services
7CS3A	**Data Mining & Ware Housing Year of study: 2017-18**
CO473.1	Student will be able to understand introduction to data mining, preprocessing data reduction.
CO473.2	Student will learn concept description and Association rule mining.
CO473.3	Student can understand classification and clustering.
CO473.4	Student will know Data Warehousing and its Architecture.
CO473.5	Student will understand OLAP, Aggregation, Backup and Recovery
7CS4A	**Computer Aided Design for VLSI Year of study: 2017-18**
CO474.1	Establish the relation between CAD tool and digital electronic system for modeling design, analysis and verification ASIC of very large
CO474.2	Able to gain the knowledge about Boolean function and its application in Binary Decision Diagram. (BDD)
CO474.3	Able to gain the knowledge about delay generation and delay elimination in digital systems.
CO474.4	Identify, formulate, design and synthesis problems related to digital circuits like adder, subtractor and FSM.
CO474.5	Testing of CMOS layout using CAD tools and applying routing and placement alogorithm for optimization.
7CS5A	**Compiler Construction Year of study: 2017-18**
CO475.1	Students will be able to learn major concepts in areas of language translation and compiler design.
CO475.2	Students will be able to ability to identify, formulate, and solve computer engineering problems with proper systematic & semantic
CO475.3	Students will be able to Develop possible program constructs for further code generation with Type checking.
CO475.4	Students will be able to learn various concepts of symbol tables, Run time environments, memory management strategy.
CO475.5	Students will get the concepts of Intermediate code generation, Code optimization and Code generations.
7CS6A	**Advance DataBase Management Systems Year of study: 2017-18**
CO476.1	Basic knowledge of storing, querying and managing large amounts of data and the associated languages, tools and systems
CO476.2	Evaluate and Apply Advanced Database Development Techniques
CO476.3	Explain and evaluate the fundamental theories and requirements that influence the design of modern database systems
CO476.4	Design & Implement Advanced Database Systems.
CO476.5	To develop skills in advanced visual & conceptual modelling and database design
8CS1A	**Mobile Computing Year of study: 2017-18**
CO481.1	Students will be able to understand mobile computing and various adapitibility issues in it and mobility management.
CO481.2	Students will be able to learn Data Dissemination and management and mobile cache maintenance schemes.
CO481.3	Students will be able to explore about middleware for application development and Service Discovery of middleware.
CO481.4	Students will be able to understand about Mobile IP and TCP , database systems in mobile environment and WWW and mobility.

CO481.5	Students will be able to learn AD-Hoc network and various routing protocols and algorithms .
8CS2A	**Digital Image Processing Year of study: 2017-18**
CO482.1	Students will be able to understand the fundamental steps involve in image processing, how image is acquired using different sensors
CO482.2	Students will be able to apply different types of transform function on image for sharpening and smoothing in spatial as well as in
CO482.3	Students will be able to analyze different types of noise occurs in image during transmission and able to restore the image using inverse
CO482.4	Students will be able to develop encoder and decoder for compression of image using diffrent coding techniques .
CO482.5	Students will be able to differentiate between line point and edge detection, how edges and boundaries are linked and segment the
8CS3A	**Distributed Systems Year of study: 2017-18**
CO483.1	Understanding the basics of distributed systems along with associated applications and research issues
CO483.2	Understanding the features, models,design issues, logical clock and event precedence
CO483.3	Understanding of concurrent process,interprocess communication and its characteristics, RPC and RMI
CO483.4	Understanding of system performance model, static process scheduling, dynamic load balancing, DFS
CO483.5	Understanding of distributed shared memory , faults, recovery and replicated distributed agreement
8CS4.2A	**Real Time Systems Year of study: 2017-18**
CO484.1	Students will be able understand the basics of Real time System, concept of tasks & timing constraints.
CO484.2	Case studies of any real world software with the help of visual programming aids.
CO484.3	Students will be able toexplore Periodic Task scheduling and priority driven scheduling.
CO484.4	Students will be able to understand Aperiodic task scheduling.
CO484.5	Students will be able to explore resource access control & different priority ceiling protocol