UG Course Outcomes for 2017-18 Courses	
Department of Computer Science and Engineering	
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**Engineering Mathematics – III**
Course Code	**15MAT31**
Course Outcome #	**Course Outcome**
CO1	Make use of Fourier series to analyze wave forms of periodic functions
CO2	Make use of Fourier transforms and Z - transforms to analyze wave forms of non periodic functions
CO3	Identify statistical methods to find correlation and regression lines, also numerical methods to solve transcendental equations.
CO4	Utilize Numerical techniques for various finite difference technique problems
CO5	Construct Greens, divergence and Stokes theorems for various engineering applications
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**Analysis & Digital Electronics**
Course Code	**15CS32**
Course Outcome #	**Course Outcome**
CO1	Utilize JFETs and MOSFETs , Operational Amplifier circuits for different applications
CO2	Construct Combinational Logic, Simplification Techniques using Karnaugh Maps, Quine McClusky Technique.
CO3	Apply knowledge of Operation of Decoders, Encoders, Multiplexers, Adders , Subtractors for constructing different circuits
CO4	Make use of latches, Flip-Flops, Designing Registers, Counters for constructing sequential circuits
CO5	Identify the applications of Synchronous and Asynchronous counters, A/D and D/A Converters
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**Data Structures & Applications**
Course Code	**15CS33**
Course Outcome #	**Course Outcome**
CO1	Summarize the basic data structures concepts such as arrays, structures, unions, pointers, strings and dynamic memory allocation functions.
CO2	Make use of stacks to evaluate mathematical expressions and queues for mazing problem.
CO3	Choose linked lists to implement of lists, stacks, queues, polynomials and sparse matrix.
CO4	Construct various types of trees using linked lists and apply tree traversal methods for expressions evaluation.
CO5	Utilize BFS, DFS, searching, sorting, hashing and files concepts to develop various applications.

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**Computer Organization**
Course Code	**15CS34**
Course Outcome #	**Course Outcome**
CO1	Infer the basics of computer organization structure, its operations, machine instructions and addressing modes.
CO2	Illustrate the different ways of communication with I/O devices, concept of interrupts, Direct Memory access.
CO3	Identify the needs of interface circuits, Buses in computers and different types of memories.
CO4	Make use of different types of memories based on its speed, size and cost.
CO5	Apply various arithmetic and logical operations on integer and floating point numbers, hard wired control, microcontroller's instructions and embedded systems.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**UNIX and Shell Programming**
Course Code	**15CS35**
Course Outcome #	**Course Outcome**
CO1	Identify the commands such as echo, printf, ls, date, passwd cal etc with options. Experimenting with user terminal, displaying characteristics and setting them.
CO2	Organize the unix files by creating a parent child relationship, manipulating PATH, constructing directories, making use of cat, mv, rm, cp, wc and od commands, Changing file permissions
CO3	Utilize vi editor with mode commands, navigation and pattern searching, wild cards, regular expressions
CO4	Compare ordinary and environment variables, read and read only commands, control statements like if while for and case, hard and soft links of a file.
CO5	Examine Perl scripts, parent and child processes, applying kill command, arrays with key value functions, simple and multiple search patterns.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**Discrete Mathematics Structures**
Course Code	**15CS36**
Course Outcome #	**Course Outcome**
CO1	Interpret propositional and predicate logic in knowledge representation and truth verification.
CO2	Demonstrate the properties of integers and fundamental principle of counting in discrete structures.
CO3	Utilize the understandings of relations and functions and be able to determine their properties
CO4	Solve the problems using the concept of graph theory and trees properties
CO5	Solve problems using recurrence relations and Principle of Inclusion and Exclusion

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**Analysis & Digital Electronics Laboratory**
Course Code	**15CSL37**
Course Outcome #	**Course Outcome**
CO1	Utilize Electronic Devices like Cathode ray Oscilloscope, Signal generators, Digital Trainer Kit, Multimeters
CO2	Make use of various components like Resistors, Capacitors, Op amp and Integrated Circuit
CO3	Construct various combinational logic circuits.
CO4	Identify various types of counters and Registers using Flip-flops
CO5	Make use of simulation package to design circuits.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**Data Structures & Applications Laboratory**
Course Code	**15CSL38**
Course Outcome #	**Course Outcome**
CO1	Demonstrate array operations and string application programs.
CO2	Construct the programs to implement stacks, queues and their applications.
CO3	Develop the programs to implement various operations of linked lists and their applications.
CO4	Make use of tree concepts to implement programs for their applications.
CO5	Apply DFS/BFS method for graph traversals and linear probing approach for hashing programs.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Engineering Mathematics – IV**
Course Code	**15MAT41**
Course Outcome #	**Course Outcome**
CO1	Apply Numerical methods to obtain the solution of fist order and first degree differential equations.
CO2	Make use of probability theory on discrete and continuous random variables to obtain the solution of problems on different distributions and joint probability distribution.
CO3	Identify the problems on sampling distribution and on markov chains in attempting the engineering problems for feasible random events.
CO4	Utilize the Bessel's and Legendre functions for the problems arising in engineering fields.
CO5	Construct the analytic functions. Calculate residues and poles of complex potentials in flow problems.

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Software Engineering**
Course Code	**15CS42**
Course Outcome #	**Course Outcome**
CO1	Outline the software engineering principles and illustrate the activities involved in building large software and also illustrating the process of requirements, requirements classification.
CO2	Analyze system models, Develop and construct UML diagrams and make use of design patterns to come with solutions for open source development.
CO3	Choose the appropriate testing type, also identifying the importance of software maintenance.
CO4	Identify the right software pricing and measurements of software metrics. Also to identify the software quality parameters
CO5	Illustrate the need for agile software development and to show the agile practices.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Design and Analysis of Algorithms**
Course Code	**15CS43**
Course Outcome #	**Course Outcome**
CO1	Infer the Performance Analysis of various Algorithms, Fundamentals of Data Structures and their applications.
CO2	Utilize the Divide and Conquer Algorithm techniques to provide a solutions for well known problems like searching, Sorting etc.
CO3	Make use of the Algorithms using Greedy method to find Minimum Cost of a Spanning Trees and also use Transforms and Conquer Approach for Heap sort.
CO4	Apply Dynamic Programming method to provide solutions for the problems like Transitive Closure, All Pairs Shortest paths and Travelling Sales Person(TSP)
CO5	Choose the Backtracking Algorithms for N-Queens, Sum of subsets Problems and also apply Branch and Bound Techniques for 0/1 Knapsack problem.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Micrpprocessors and Microcontrollers**
Course Code	**15CS44**
Course Outcome #	**Course Outcome**
CO1	Explain the evolution of Intel microprocessor and illustrate the architecture of 8088/86 microprocessor
CO2	Apply basic knowledge to perform arithmetic, logic, string operations and develop assembly language code to solve problems.
CO3	Build interfaces for x86 Microprocessor
CO4	Explain the RISC philosophy and ARM processor fundamentals
CO5	Apply the ARM instruction set to construct assembly code for ARM microcontroller

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Object Oriented Concepts**
Course Code	**15CS45**
Course Outcome #	**Course Outcome**
CO1	Explain fundamental features of object oriented language
CO2	Explain Java Runtime Environment, Java Language building Blocks and illustrate to run simple Java programs
CO3	Construct Java programs by making use of 3 principles of OOPS with run time error handling mechanisms
CO4	Make Use of multithreading concepts, and event handling mechanism to build Java programs
CO5	Develop event driven Graphical User Interface (GUI) programming using applets and swings
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Data Communication**
Course Code	**15CS46**
Course Outcome #	**Course Outcome**
CO1	Infer the basic computer networks and demonstrate the working of physical layer.
CO2	Make use of the different types of transmission and construct the switching model.
CO3	Solve the various error detection and correction techniques.
CO4	Apply Media access control and utilize wired and wireless networks
CO5	Identify the different network layer protocols.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Design and Analysis of Algorithms Laboratory**
Course Code	**15CSL47**
Course Outcome #	**Course Outcome**
CO1	Demonstrate the object oriented concepts of JAVA programming language.
CO2	Construct the JAVA program by using the approach of Divide and Conquer such as Merge Sort, Quick Sort.
CO3	Make use of the Algorithms using Greedy method to develop the JAVA program such as Knapsack and finding the minimum cost of a spanning tree.
CO4	Apply Dynamic Programming technique to build the JAVA program such as All pairs shortest path and Travelling sales person (TSP) problem.
CO5	Choose the Backtracking Algorithms to model JAVA program such as Sum of subset problem and Hamiltonian cycles.

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Micrpprocessors and Microcontrollers Laboratory**
Course Code	**15CSL48**
Course Outcome #	**Course Outcome**
CO1	Demonstrate the use of 8086 instructions set and the directives.
CO2	Apply knowledge of 8086 instructions set and the directives to do Assembly Language Programs.
CO3	Build interfaces for x86 Microprocessors.
CO4	Make use of the knowledge of ARM Processor instructions set to do ALP code.
CO5	Construct interfaces for ARM Microcontrollers.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Management & Entreprenuership for IT Industry**
Course Code	**15CS51**
Course Outcome #	**Course Outcome**
CO1	Outline of the functional areas of management and classify the different levels of management
CO2	Illustrate the motivational theories, Leadership Style, Direction and controlling
CO3	Identify the characteristics, role and types of entrepreneurs
CO4	Examine the project and its significance also reporting
CO5	Classify the characteristics, steps and policies in establishing micro and small enterprises.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Computer Networks**
Course Code	**15CS52**
Course Outcome #	**Course Outcome**
CO1	Illustarte application layer protocols, Application of protocol
CO2	Organize transport layer services and understand UDP and TCP protocols, Application of protocol
CO3	Apply routers, IP and Routing Algorithms in network layer, Application of protocol
CO4	Utilize the wireless and Mobile Networks covering IEEE 802.11 standard
CO5	Identify concepts of multimedia networking, security and network management

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Database Management System**
Course Code	**15CS53**
Course Outcome #	**Course Outcome**
CO1	Develop conceptual understanding of database management system
CO2	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
CO3	Use Structured Query Language (SQL) for database manipulation.
CO4	Design and build simple database systems
CO5	Develop application to interact with databases.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Automata Theory Computability**
Course Code	**15CS54**
Course Outcome #	**Course Outcome**
CO1	Outline core concepts in Automata and theory of Computations.
CO2	Identify different Formal language Classes and their Relationships
CO3	Build grammars and recognizrs for different formal languages
CO4	Identify Prove or disprove theorems in automata theory using their properties
CO5	Solve the decidability and intractability of Computational problems
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Advanced JAVA & J2EE**
Course Code	**15CS553**
Course Outcome #	**Course Outcome**
CO1	Make use of the advanced Java concepts like enumerations and collections with programs
CO2	Construct Java programs by making use of java's String handling functions
CO3	Illustrate database access and details for managing information using the JDBC API
CO4	Adapt servlets to build server side programs
CO5	Demonstrate the use of JavaBeans to develop component-based Java software

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Cloud Computing**
Course Code	**15CS565**
Course Outcome #	**Course Outcome**
CO1	Explain the technology and principles involved in building a cloud environment.
CO2	Contrast various programming models used in cloud computing Cloud Computing Architecture,
CO3	Illustrate concurrent computing appropriate to cloud model for a given application
CO4	Outline Data Intensive Computing related to map reduce concepts
CO5	Explain the Cloud Platforms in Industry, Choose appropriate cloud model for a given application
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Computer Networks Laboratory**
Course Code	**15CSL57**
Course Outcome #	**Course Outcome**
CO1	Utilize socket program using TCP & UDP
CO2	Develop security algorithm to provide network security
CO3	Make use of CRC to develop the code for Data link layer protocol
CO4	Develop the performances of Routing protocol
CO5	Build Wired and Wireless network using network simulator
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Database Management System Laboratory**
Course Code	**15CSL58**
Course Outcome #	**Course Outcome**
CO1	Ability to understand how the tables are created.
CO2	Ability to understand how to extract the data from more than 1 table by performing join operations.
CO3	Ability to Create the tables by properly specifying the primary keys and the foreign keys
CO4	Able to Populate and query a database using SQL DML/DDL commands
CO5	Able to query multiple tables using joins and aggregate functions Demonstrate on-delete-cascade and on-update-cascade concepts

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Cryptograhy Network Scurity and Cyber Law**
Course Code	**15CS61**
Course Outcome #	**Course Outcome**
CO1	Utilize the basics of Cryptography techniques for enhancing the security
CO2	Analyze Cryptography algorithms and its need to various applications
CO3	Apply different Authentication mechanisms and make use of Security protocols
CO4	Identify different security technologies to secure WLAN
CO5	Summarize cyber security and need for cyber Law
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Computer Graphics and Visualization**
Course Code	**15CS62**
Course Outcome #	**Course Outcome**
CO1	Design and implement algorithms for 2D graphics primitives and attributes.
CO2	Illustrate Geometric transformations on both 2D and 3D objects.
CO3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.
CO4	Decide suitable hardware and software for developing graphics packages using OpenGL.
CO5	Design interactive programs
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**System Software and Compiler Design**
Course Code	**15CS63**
Course Outcome #	**Course Outcome**
CO1	Make use of the Lexical analyzer to generate tokens
CO2	Utilize different parsers to parse the given input string
CO3	Construct the target code for any given program
CO4	Identify the System Software such as Assemblers, Macro processors
CO5	Apply the operation of loader and linker to create object files and executable files

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Operating Systems**
Course Code	**15CS64**
Course Outcome #	**Course Outcome**
CO1	Identify the need and various types of Operating Systems.
CO2	Apply suitable techniques for process scheduling, synchronization and thread management.
CO3	Make use of deadlock and memory management scheme.
CO4	Illustrate the need of demand paging, file and directory management.
CO5	Utilize disk management schemes and realize the different concepts of Operating System in platform of usage through case studies
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Operation Research**
Course Code	**15CS653**
Course Outcome #	**Course Outcome**
CO1	Model the given problem as transportation and assignment problem and solve.
CO2	Apply game theory for decision support system.
CO3	Outline the concepts of operation Research and illustrate the linear Programming problems with relevant examples.
CO4	Select and apply optimization techniques for various problems.
CO5	Solve Linear programming problems using another optimization technique (using dual simplex method)
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Python Application Programming**
Course Code	**15CS664**
Course Outcome #	**Course Outcome**
CO1	Make use of Python syntax and semantics to work on control statements and functions.
CO2	Utilize the concepts of Strings and File Systems
CO3	Build Python programs using core data structures like Lists, Dictionaries and use Regular Expressions in python
CO4	Utilize the concepts of Object-Oriented Programming and apply in Python.
CO5	Construct exemplary applications related to Network Programming, Web Services and Databases in Python.

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**System Software and Compiler Design Laboratory**
Course Code	**15CSL67**
Course Outcome #	**Course Outcome**
CO1	Utilize LEX and YACC to execute programs to recognize valid arithmetic expression, evaluation of expression, to recognize strings, eliminate comment lines and recognize valid identifiers
CO2	Construct LL(1) parser for given grammar
CO3	Make use of triples to generate machine code
CO4	Develop programs for CPU Scheduling, deadlock detection, page replacement policies
CO5	Build a YACC program to produce Parse tree by accepting a regular expression
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Computer Graphics & Visualization Laboratory**
Course Code	**15CSL68**
Course Outcome #	**Course Outcome**
CO1	Illustrate the knowledge on OpenGL.
CO2	Apply the concepts of computer graphics
CO3	Implement computer graphics applications using OpenGL
CO4	Develop modular programming skills.
CO5	Analyze and Animate real world problems using OpenGL
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Object Oriented Modeling And Design**
Course Code	**10CS71**
Course Outcome #	**Course Outcome**
CO1	Illustrate the Object Oriented Modeling Concepts and Class Modeling.
CO2	Outline Advance Class Modeling, State Modeling and Interaction Modeling
CO3	Develop system using domain class model, state model and interaction model
CO4	Analyze the System using interaction model, class model, state model
CO5	Evaluating of System using class design, design patterns

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Embedded Computing Systems**
Course Code	**10CS72**
Course Outcome #	**Course Outcome**
CO1	Understand the Design Process of an Embedded System
CO2	Acquire the basic Knowledge about ARM processor
CO3	Become aware of ARM processor with its programming aspects
CO4	Analyze various examples of embedded systems based on ARM processor
CO5	Gain knowledge of RTOS in embedded system design process
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Programming The Web**
Course Code	**10CS73**
Course Outcome #	**Course Outcome**
CO1	Make use the fundamentals of web and there by develop web applications using various language.
CO2	Utilize the essential technology needed to develop and implement web
CO3	Make use of Scripting language utilities for static and dynamic environment.
CO4	Design XML document with presentation using CSS and XSLT
CO5	Construct CGI applications using PERL and Rails applications using Ruby.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Advanced Computer Architectures**
Course Code	**10CS74**
Course Outcome #	**Course Outcome**
CO1	Identify various Computer designs.
CO2	Apply Pipelining to speed up processing of computer
CO3	Make use of parallelism, scheduling- Static scheduling , Dynamic scheduling in designing computer architecture
CO4	Apply types of multiprocessors and thread level parallelism in designing computer architecture
CO5	Build various Memory hierarchy and its design

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Java And J2EE**
Course Code	**10CS753**
Course Outcome #	**Course Outcome**
CO1	Identify the fundamental concepts of JAVA
CO2	Utilize the concept of classes, Inheritance, Exceptions and Applets in Programming
CO3	Make use of Multithreading, Event Handling to build Java Programs and Construct swing Applets.
CO4	Develop the code in JDBC to Communicate with database
CO5	Build the JSP Pages and Enterprise Java Bean.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Storage Area Networks**
Course Code	**10CS765**
Course Outcome #	**Course Outcome**
CO1	Illustrate the Storage Architectures
CO2	Apply RAID Array on Disk Performance
CO3	Compare NAS, iSCSI ,FCIP
CO4	Identify different types of Storage Virtualization and CAS
CO5	Classify backup, recovery, disaster recovery, business continuity, and replication
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Networks Laboratory**
Course Code	**10CSL77**
Course Outcome #	**Course Outcome**
CO1	Utilize socket program using TCP & UDP
CO2	Develop security algorithm to provide network security
CO3	Make use of CRC to develop the code for Data link layer protocol
CO4	Develop the performances of Routing protocol
CO5	Simulate different scenario with respect to different network size, type and connectivity and run the scenario for proper inputs and analyze output.
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Web Programming Laboratory**
Course Code	**10CSL78**
Course Outcome #	**Course Outcome**
CO1	Develop dynamic web pages using XHTML, CSS, and JavaScript.
CO2	Design and develop web pages using XML, XSLT and CSS.
CO3	Design and develop dynamic web pages using CGI,PHP and SQL
CO4	Design and develop dynamic web pages using CGI, Perl and SQL
CO5	Design and develop dynamic web pages using PHP, SQL and Ruby and Rails

Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VIII**
Course Name	**Software Architecture**
Course Code	**10CS81**
Course Outcome #	**Course Outcome**
CO1	Utilize Software architecture concepts, various architectural structures and styles to plan software development.
CO2	Select software quality attributes and tactics, choose mud to structure architectural patterns to infer network systems and compiler software systems.
CO3	Apply Broker, Model View Control and Presentation Abstraction Control architectural patterns to identify distributed and interactive software systems.
CO4	Make use of architectural design patterns such as whole-part, organization work and access control to build software systems.
CO5	Build architecture for developing software system and choose relevant documenting views.
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**System Modeling And Simulation**
Course Code	**10CS82**
Course Outcome #	**Course Outcome**
CO1	Identify the System components and apply analytical modeling methods to simulate the activities of systems- Queuing, inventory & reliability.
CO2	Make use of the characteristics of a Discrete system and Event scheduling time advance algorithm to model the Single Queuing Simulation in Java. Identify useful statistical models, discrete and continuous distributions.
CO3	Model the behavior of M/G/1 queue behavior with measures of performance of queuing systems, Random number and variate generation, Tests for random numbers.
CO4	Identify the steps in Input Modeling by choosing parameters, Solve Goodness of fit tests problems.
CO5	Apply effective verification, calibration and validation of methods, Plan Optimization through Simulation.
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VIII**
Course Name	**Information And Network Security**
Course Code	**10CS835**
Course Outcome #	**Course Outcome**
CO1	Identify the Security Policies, Standards, and Practices in an organization and planning for the same.
CO2	Construct the Firewall rules set for an Organization and to identify Scanning and Analysis Tools
CO3	Utilize the basics of Cryptographic techniques for enhancing security.
CO4	Identify different security attacks and services based on Internet Standards
CO5	Identify IP security and web Security issues.

Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**Ad-Hoc Networks**
Course Code	**10CS841**
Course Outcome #	**Course Outcome**
CO1	Classify the features of Adhoc Wireless Network along with its applications
CO2	Identify the operation of several media access protocols for Adhoc network
CO3	Applythe working of various routing protocols for different applications
CO4	Make use of the transport layer protocols for ad hoc wireless network
CO5	Utilize the security protocols and QoS support for Adhoc Network
PG Courses	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Advances in Operating Systems**
Course Code	**17SCS11**
Course Outcome #	**Course Outcome**
CO1	Identify Operating system responsibilities, modern types and process management.
CO2	Make use of threads and virtual memory management concepts.
CO3	Utilize multiprocessor and real time scheduling to improve operating system performance.
CO4	List embedded operating system characteristics, types of security threats and attacks.
CO5	Examine general operating system and windows NT/2000/XP kernel organization aspects.
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Cloud Computing**
Course Code	**17SCS12**
Course Outcome #	**Course Outcome**
CO1	Build and experiment simple Cloud Applications
CO2	Create virtual machines from available physical resources
CO3	Experiment With resource allocation and scheduling algorithms
CO4	Inspect the Map-Reduce concept.
CO5	Dissect Setting up a private cloud and familiarize with Open Stack
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Advances in Database Management Systems**
Course Code	**17SCS13**
Course Outcome #	**Course Outcome**
CO1	Identify the fundamental concepts of Databases and parallel, distributed databases and its applications
CO2	Make use of the Object oriented Databases and Implementation of related issues for extended type systems.
CO3	Develop the Distributed DBMS architectures and Storing data in a Distributed DBMS
CO4	Obtain effective Implementation techniques for OLAP and Clustering Similarity search over sequences.
CO5	Inspect various Active database concepts, triggers and Deductive Databases

Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Probability Statistics and Queing Theory.**
Course Code	**17SCS14**
Course Outcome #	**Course Outcome**
CO1	Identify use of probabilty and characterize probabilty models using probablity mass function and cumulative distribution funcrion.
CO2	Utilize the techiques of developing discrete and continuos probabilty distributions and its applications.
CO3	Make use of random process in terms of its mean and corelation funcrions.
CO4	List the methods of hypothesis testing for goodness of fit.
CO5	Examine terminology and nomenclature appropriate queuing theory.
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Advances in Storage Area Networks**
Course Code	**17SCS153**
Course Outcome #	**Course Outcome**
CO1	Identify the need for performance evaluation and the metrics used for it
CO2	Apply the techniques used for data maintenance.
CO3	Realize strong virtualization concepts.
CO4	Develop techniques for evaluating policies for LUN masking, file systems
CO5	Develop techniques with the use of SNMP, CIM and WBEM .
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Operating Systems and ADBMS Laborartory**
Course Code	**17SCS16**
Course Outcome #	**Course Outcome**
CO1	Build and experiment simple Cloud Applications
CO2	Create virtual machines from available physical resources
CO3	Experiment With resource allocation and scheduling algorithms
CO4	Inspect the Map-Reduce concept.
CO5	Dissect Setting up a private cloud and familiarize with Open Stack
	M. Tech 2017-18 Even 2nd -SEM
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Managing Big Data**
Course Code	**17SCS21**
Course Outcome #	**Course Outcome**
CO1	Determine big data and its use cases from selected business domains
CO2	Make Use of NoSQL big data management
CO3	Experiment with Hadoop and HDFS by Installing and configuring.
CO4	Contrast the performance of map-reduce analytics using Hadoop
CO5	Inspect Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data Analytics

Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Advances in Computer Networks**
Course Code	**17SCS22**
Course Outcome #	**Course Outcome**
CO1	Build the network services, protocols and architectures.
CO2	Choose key Internet applications and their protocols to develop their own applications using the sockets API.
CO3	Develop effective communication mechanisms using techniques like connection establishment, queuing theory and recovery.
CO4	Examine various congestion control techniques.
CO5	Inspect the concept of resource allocation.
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Advanced Algorithms**
Course Code	**17SCS23**
Course Outcome #	**Course Outcome**
CO1	Compare the growth functions of different recurrence equations.
CO2	Utilize the different graph algorithms like Bellman – Ford, Johnson's,etc.
CO3	Make use of the Number theoretic algorithms such as Chinese remainder theorem, RSA cryptosystem , etc.
CO4	Apply String-Matching Algorithms such as Naïve string Matching, Knuth-Morris-Pratt algorithm, Boyer – Moore algorithm.
CO5	Choose Probabilistic and Randomized Algorithms like Monte Carlo and Las Vegas algorithms.
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Internet of Things**
Course Code	**17SCS24**
Course Outcome #	**Course Outcome**
CO1	Develop schemes for the applications of IOT in real time scenarios.
CO2	Identify IoT Mechanism and Key Technologies.
CO3	Examine the Layered Connectivity and IPV6 Technologies.
CO4	Discover the practical knowledge through different case studies.
CO5	Inspect the data sets received through IoT devices and tools used for analysis.
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Information and Network Security**
Course Code	**17SCS253**
Course Outcome #	**Course Outcome**
CO1	Explain the fundamentals of Cryptography.
CO2	Apply the knowledge of number theory in Public Key Crypto Systems
CO3	Identify the key management issues and resolve it.
CO4	Experriment with encryption techniques to secure data in transit across data networks.
CO5	Utilize security applications in the field of information technology.

Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Information and Network Security**
Course Code	**17SCS253**
Course Outcome #	**Course Outcome**
CO1	Explain the fundamentals of Cryptography.
CO2	Apply the knowledge of number theory in Public Key Crypto Systems
CO3	Identify the key management issues and resolve it.
CO4	Experriment with encryption techniques to secure data in transit across data networks.
CO5	Utilize security applications in the field of information technology.
	M. Tech 2017-18 Even 4th -SEM
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Machine Learning Techniques**
Course Code	**14SCS41**
Course Outcome #	**Course Outcome**
CO1	Identify the fundamental concepts of Machine learning and implement Find-S algorithm
CO2	Make use of the fundamental concepts of Machine learning to learn decision tree representation for ID3 algorithm and Perceptrons
CO3	Utilize the neural network and Bayes Classifier to solve the problems in Machine Learning
CO4	CExamine Candidate elimination algorithm, and EM algorithm for problems appear in Machine Learning
CO5	Inspect Back propagation algorithm, Estimating Hypotheses, Instance based Learning and Reinforcement learning
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**Wireless Network And Mobile Computing.**
Course Code	**14SCS424**
Course Outcome #	**Course Outcome**
CO1	Explain, Analyze and applt therole of SSM, GPRS, 3G and WiMax technologies in wireless networks.
CO2	Apply the principles of mobile computing technologies.
CO3	Identify and learn about traditional and modern network technologies and mobile computing. (Understand Mobile OS, Mobile Computing Environment
CO4	Explain CDMA, GSM, Mobile IP, WiMax and differene Mobile OS.
CO5	Demonstrate program for CDLC, MIDP let model and security concerns.

Course Outcomes for 2017-18 Courses	
Course Outcomes for III SEM SUBJECTS	
	ELECTRONICS AND COMMUNICATION ENGINEERING
Semester	**III**
Course Name	**Engineering maths -III**
Course Code	**15MAT31**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Students are able to solve higher order linear differential equations and apply Knowledge to modeling and analyzing mass spring systems
CO2	Students are Apply Laplace transform and Fourier transform techniques to solve differential equations involved in Vibration theory, Heat transfer and related engineering applications.
CO3	Students are capable to use statistical methods like correlation, regression analysis in analyzing, interpreting experimental data and probability theory in testing and quality control.
CO4	Students solve vector differentiation and integration, analyze the vector fields and apply to fluid flow problems.
CO5	Students Solve various partial differential equations such as wave equation, one and two dimensional heat flow equations.
Semester	**III**
Course Name	**ANALOG ELECTRONICS**
Course Code	**15EC32**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain the working principle and characteristics of BJT, FET, Single stage, cascaded and feedback amplifiers.
CO2	Distinguish the Phase shift, Wien bridge, tuned and crystal Oscillators using BJT/FET/UJT.
CO3	Solve for the AC gain and impedance for BJT using r_e and h Parameters models for CE and CC configuration.
CO4	Identify the performance characteristics and parameters of BJT and FET amplifier using small signal model.
CO5	Determine parameters which affect low frequency and high frequency responses of BJT and FET amplifiers. Compare efficiency of Class A and Class B power amplifiers and voltage regulators.

Semester	**III**
Course Name	**DIGITAL ELECTRONICS**
Course Code	**15EC33**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply Boolean algebra and Karnaugh Map to analyze combinational digital circuits.
CO2	Apply Quine Mc-Cluskey technique for minimization of Boolean expression to get minimal SOP and POS Forms.
CO3	Analyze and design combinational digital electronic circuits to meet the given Specifications/Constraints.
CO4	Understand the working of the basic components used inSequential circuits and hence design Sequential circuit.
CO5	Analyze and develop state diagram, state table, state equation for Mealy and Moore Finite state machine.

Semester	**III**
Course Name	**Network Analysis**
Course Code	**15EC34**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Make use of source transformation, source shifting, mesh, nodal analysis and reduce given network using star-delta transformation, source transformation and source shifting to find voltage and current of the electrical circuit.
CO2	Solve network problems by applying Superposition, Reciprocity, thevenin's, Norton's, Maximum Power Transfer, Millman's Network theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions.
CO3	Make use of Laplace transform to calculate current and voltages for the given circuit under transient conditions.
CO4	Identify parameters like resonant frequency, quality factor, half power frequencies, voltage across inductor and capacitor, current through the RLC elements, in resonant circuits.
CO5	Solve the given network using specified two port network parameter like Z or Y or T or H.
Semester	**III**
Course Name	**ELECTRONIC INSTRUMENTATION**
Course Code	**15EC35**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Describe instrument measurement errors and calculate them.
CO2	Describe the operation of Ammeters, Voltmeters, Multimeters and develop circuits for multirange Ammeters and Voltmeters.
CO3	Describe functional concepts and operation of Digital voltmeters and instruments to measure voltage, frequency, time period, phase difference of signals, rotationspeed, capacitance and pH of solutions.
CO4	Describe functional concepts and operation of various Analog measuring instruments to measure output power, field Strength, impedance, stroboscopic speed, in/out of phase, Q of coils, insulation resistance and pH.
CO5	Describe and discuss functioning and types of Oscilloscopes, Signal generators and Transducers.

Semester	**III**
Course Name	**Engineering Electromagnetics**
Course Code	**15EC36**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Interpret the problems on electric field due to point, linear, volume charges by applying conventional methods or by Gauss law.
CO2	Analyze potential and energy with respect to point charge and capacitance using Laplace equation.
CO3	Calculate magnetic field, force, and potential energy with respect to magnetic materials.
CO4	Apply Maxwell's equation for time varying fields, EM waves in free space and conductors.
CO5	Evaluate power associated with EM waves using Poynting theorem.
Semester	**III**
Course Name	**Analog Electronics Lab**
Course Code	**15ECL37**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Inspect the circuits of rectifiers, clipping circuits, clamping circuits and voltage regulators.
CO2	Conclude the characteristics of BJT and FET amplifiers and plot its frequencyresponse.
CO3	Estimate the performance parameters of amplifiers and voltage regulators.
CO4	Model the BJT/FET amplifiers, BJT Power amplifier.
CO5	Examine the performance characteristics of oscillators.

Semester	**III**
Course Name	**Digital Electronics Lab**
Course Code	**15ECL38**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Determine the truth table of various expressions and combinational circuits using logic gates.
CO2	Design and test various combinational circuits such as adders, subtractors, comparators, multiplexers.
CO3	Simplify Boolean expression using decoders.
CO4	Assess and test flips-flops, counters and shift registers
CO5	Build full adder and up/down counters
Course Outcomes for IV SEM SUBJECTS	
Semester	**IV**
Course Name	**ENGG. MATHEMATICS – IV**
Course Code	**15MAT41**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply Numerical methods to obtain the solution of fist order and first degree differential equations.
CO2	Make use of probability theory on discrete and continuous random variables to obtain the solution of problems on different distributions and joint probability distribution.
CO3	Identify the problems on sampling distribution and on markov chains in attempting the engineering problems for feasible random events.
CO4	Utilize the Bessel's and Legendre functions for the problems arising in engineering fields.
CO5	Construct the analytic functions. Calculate residues and poles of complex potentials in flow problems.

Semester	**IV**
Course Name	**MICROPROCESSORS**
Course Code	**15EC42**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identifythe different CPU architectures,8086 Microprocessor architecture and addressing modes of 8086.
CO2	Make use of the instruction set, addressing modes and directives of 8086 to develop assembly language programs.
CO3	Make use of the interrupts and subprogramsdevelop modular programs.
CO4	CModel the static RAM, 7segment display and keyboard using PIO 8255 with 8086.
CO5	Model the ADC-0808, DAC-0800 and stepper motor using PIO 8255 with 8086. Identify the architecture of 8088 and 8087, modes of 8254 Timer.
Semester	**IV**
Course Name	**CONTROL SYSTEMS**
Course Code	**15EC43**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Develop the mathematical model of mechanical and electrical systems.
CO2	Explain time domain specifications for first and second order sytems
CO3	Identify the stability of the systems in the time domain using Routh Hurwitz criteria and Root locus technique.
CO4	Apply the concept of stability of a system in the frequency domain using Nyquist and Bode plots
CO5	Model a control system in continous and discrete time using state variable technique.

Semester	**IV**
Course Name	**SIGNALS AND SYSTEMS**
Course Code	**15EC44**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Classify the signals as continuous/discrete, periodic/aperiodic, even /odd, energy/power and deterministic/random signals.
CO2	Identify the linearity, causality, time-invariance and stability properties of continuous and discrete time systems.
CO3	Solve the response of a Continuous and Discrete LTI system using convolution integral and convolution sum.
CO4	Solve the spectral characteristics of continuous and discrete time signal using Fourier analysis.
CO5	Solve Z-transforms, inverse Z-transforms and transfer functions of complex LTI systems.
Semester	**IV**
Course Name	**PRINCIPLES OF COMMUNICATION SYSTEMS**
Course Code	**15EC45**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply the time and frequency domain knowledge for the generation and demodulation of amplitude modulated signals.
CO2	Identify the performance of different generation and detection methodologies of AM, FM and multiplexing.
CO3	Utilize analog signals in time domain as random processes and identify the types of basic Noise
CO4	Identify the influence of noise in receivers of analog modulated signals
CO5	Compare the characteristics of pulse modulation techniques

Semester	**IV**
Course Name	**LINEAR INTEGRATED CIRCUITS**
Course Code	**15EC46**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify Op-amp circuit and parameters including CMRR, PSRR, Input & Output Impedances and Slew Rate.
CO2	Construct Op-amp based AC Amplifiers including Voltage Follower, Inverting / Non-inverting & Difference Amplifier and Develop circuits for Op-amp based Voltage / Current Sources & Sinks, Current, Instrumentation and Precision Amplifiers.
CO3	Develop circuits for OpAmp based linearand non-linear circuits comprising of limiting, clamping, Sample & Hold, Differentiator / Integrator Circuits, Peak Detectors ,Oscillators and Multiplier &
CO4	Make use of first & Second Order Low Pass, High Pass, Band Pass, Band Stop Filters andVoltage Regulators.
CO5	Illustrate applications of linear ICs in phase detector, VCO, DAC, ADC and Timer.
Semester	**IV**
Course Name	**MICROPROCESSOR LAB**
Course Code	**15ECL47**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Develop an Assembly Language Program (ALP)to perform data transfer arithmetic and logical applicationsusing 8086 Microprocessor
CO2	Develop Assembly Language Program to perform bit manipulation operation.
CO3	Utilize procedures and macros for modular programming and develop ALPusing assembler directives, DOS Interrupts, branch and loop operations.
CO4	Develop Assembly Language Program to perform string operation.
CO5	Develop ALPs to interface 8086 microprocessor to various peripherals for simple applications.

Semester	**IV**
Course Name	**Linear ICs& Communication Lab**
At the end of this course, the student will be able to:	
Course Code	**15ECL48**
Course Outcome #	**Course Outcome**
CO1	Inspect the basic analog systems for a given specification using the basic building blocks and ICs.
CO2	Examine the performance of instrumentation amplifier, LPF, HPF, DAC and oscillators using linear IC.
CO3	Analyze with Linear ICs for applications like addition, integration, differentiation and 555 timer operations to generate pulses.
CO4	Test for pulse and flat top sampling techniques.
CO5	Determine the percentage of modulation for AM and FM Techniques, and use PLL to synthesize the Frequency.
Course Outcomes for V SEM SUBJECTS	
Semester	**V**
Course Name	**MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT**
Course Code	**15ES51**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the fundamental concepts of Management and Entrepreneurship.
CO2	Select a best Entrepreneurship model for the required domain of establishment.
CO3	Explain the functions of Managers, Entrepreneurs and their social responsibilities.
CO4	Compare various types of Entrepreneurs ·
CO5	Survey the Institutional support by various state and central government agencies

Semester	**V**
Course Name	**Digital signal processing**
Course Code	**15EC52**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the frequency domain sampling and reconstruction of discrete time signals.
CO2	Make use of the properties and develop efficient algorithms for the computation of DFT.
CO3	Construct FIR and IIR filters in different structural forms.
CO4	Utilize the procedures to design IIR filters from the analog filters using impulse invariance and bilinear transformation.
CO5	Identify the different windows used in the design of FIR filters and design appropriate filters based on the specifications.
Semester	**V**
Course Name	**VERILOG HDL**
Course Code	**15EC53**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction& simple programs in VHDL in different styles.
CO2	Identify the suitable Abstraction level for a particular digital design. ·
CO3	Build the programs more effectively using Verilog tasks and directives.
CO4	Take part in timing and delay Simulation
CO5	Design and verify the functionality of digital circuit/system using test benches.

Semester	**V**
Course Name	**Information Theory & Coding**
Course Code	**15EC54**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain concept of dependent & independent source, measure of information, entropy, rate of information and order of a source.
CO2	Construct the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms.
CO3	Model the continuous and discrete communication channels using input, output and joint probabilities.
CO4	Develop a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolution codes
CO5	Examine the encoding and decoding circuits for Linear Block codes, cyclic codes, convolution codes, BCH and Golay codes.
Semester	**V**
Course Name	**OPERATING SYSTEMS**
Course Code	**15EC553**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain the goals, structure, operation and types of operating systems.
CO2	Apply scheduling techniques to find performance factors.
CO3	Explain organization of file systems and IOCS.
CO4	Apply suitable techniques for contiguous and non-contiguous memory allocation.
CO5	Describe message passing, deadlock detection and prevention methods.
Semester	**V**
Course Name	**Object Oriented Programming Using C++**
Course Code	**15EC562**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand Encapsulation, Inheritance and Polymorphism.
CO2	Utilize Object Oriented approach to solve problems
CO3	Examine problem statements and build object oriented models to solve the problems after analysing the objects that constitute the system.
CO4	Demonstrate function overloading, operator overloading and virtual functions.
CO5	Identify advantages of object oriented programming over procedure oriented programming.

Semester	**V**
Course Name	**DSP Lab**
Course Code	**15ECL57**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Experiment with concepts of analog to digital conversion of signals and frequency domain sampling of signals.
CO2	Experiment with Linear and circular convolution of two given sequences, Commutative, distributive and associative property of convolution.
CO3	Modelling of discrete time signals and systems and verification of its properties and results.
CO4	Experiment with FIR,IIR filters to meet the given specification.
CO5	Evaluatefor discrete computations using DSP processor and verify the results.
Semester	**V**
Course Name	**HDL Lab**
Course Code	**15ECL58**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Develop and Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions
CO2	Develop and Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms
CO3	Develop andSynthesize Combinational and Sequential circuits on programmable ICs and test the hardware
CO4	Develop and Interface the hardware to the programmable chips and obtain the required output
CO5	Develop HARDWARE DESCREPTIVE PROGRAMMES USING Verilog or VHDL for a given Abstraction level
Course Outcomes for VI SEM SUBJECTS	
Class	**ELECTRONICS AND COMMUNICATION ENGINEERING**
Semester	**VI**
Course Name	**Digital Communication**
Course Code	**15EC61**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply the concepts of Bandpass sampling to well specified signals and channels.
CO2	Identify the performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels.
CO3	Utilize the valid symbol processing and performance parameters at the Receiver under ideal and corrupted bandlimited channels.
CO4	Apply the band pass signals subjected to corrupted and distorted symbols in a band limited channel, can be demodulated and estimated at receiver to meet specified performance criteria.
CO5	Identify the need for data security using spread spectrum technique.

Semester	**VI**
Course Name	**ARM Microcontroller & Embedded systems**
Course Code	**15EC62**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.
CO2	CMake use of the knowledge gained for Programming ARM Cortex M3 for different applications.
CO3	summarize the basic hardware components and their selection method based on the characteristics and attributes of an embedded system..
CO4	Develop the hardware /software co-design and firmware design approaches
CO5	Explain the need of real time operating system for embedded system applications
Semester	**VI**
Course Name	**VLSI Design**
Course Code	**15EC63**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	interpret and understand of MOS transistor theory, CMOS fabrication flow and technology scaling.
CO2	Make use of the basic gates using the stick and layout diagrams with the knowledge of physical design aspects.
CO3	identify and understanding the concept of Memory elements along with timing considerations with scaling fundamentals
CO4	experiment with the basic knowledge of FPGA based system design Interpret testing and testability issues in VLSI Design
CO5	Analyze the CMOS subsystems and architectural issues with the design constraints
Semester	**VI**
Course Name	**Computer communication Networks**
Course Code	**15EC64**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the layering architecture of computer networks and distinguish between the OSI reference model and TCP/IP protocol suite.
CO2	Identify the protocols and services of Data link layer
CO3	Identify the basic network configurations and standards associated with each network.
CO4	Model a network scenario and determine the routing of packets using different routing algorithms.
CO5	Identify the protocols and functions associated with the transport layer services.

Semester	**VI**
Course Name	**Cellular Mobile Communication**
Course Code	**15EC651**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Illustrate the statistical characterization of urban mobile channels to compute the performance for simple modulation schemes.
CO2	Compare the limitations of GSM, GPRS and CDMA to meet high data rate requirements and limited improvements that are needed
CO3	Explain the call process procedure between a calling number and called number for all scenarios in GSM or CDMA based systems
CO4	Outline and validate voice and data call handling for various scenarios in GSM and CDMA systems for national and international interworking situations
CO5	Explain voice and data call handling for various scenarios CDMA systems for national and international interworking situations
Semester	**VI**
Course Name	**DIGITAL SWITCHING SYSTEMS(Professional Elective)**
Course Code	**15EC654**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the basic concepts and parameters of telecommunication networks and services.
CO2	Identify the evolution of switching system, its architecture and operation.
CO3	Model the traffic flow in lost call systems and queuing systems.
CO4	Organize the digital switching software architecture for various levels of control.
CO5	Outline the software aspects of switching systems and its maintenance.
Semester	**VI**
Course Name	**POWER ELECTRONICS(Open Elevtive-2)**
Course Code	**15EC662**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the characteristics of different power semiconductor devices and their applications.
CO2	Utilize the characteristics of SCR for the construction of commutation and gate triggering circuits.
CO3	Make use of the knowledge of power devices to construct different AC voltage controller and converter circuits.
CO4	Identify the classification, operation of converters and its applications.
CO5	Utilize the principle of operation and performance parameters for construction of various inverters.

Semester	**VI**
Course Name	**DIGITAL SYSTEM DESIGN USING VERILOG (Open Elevtive-2)**
Course Code	**15EC663**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Construct the combinational circuits, using discrete gates and programmable logic devices.
CO2	Design a semiconductor memory for specific chip design.
CO3	Design embedded systems using small microcontrollers, larger CPUs/DSPs, or hard or soft processor cores.
CO4	Construct different types of processor and I/O controllers that are used in embedded system.
CO5	Develop Verilog model for sequential circuits and test pattern generation.
Semester	**VI**
Course Name	**Embedded controller Lab**
Course Code	**15ECL67**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language.
CO2	CDevelop assembly language programs using ARM Cortex M3 for different applications
CO3	Develop C language programs to interface external devices and I/O with ARM Cortex M3.
CO4	Develop C language programs for embedded system applications.
CO5	Develop C language programs which makes use of library functions for embedded system applications.
Semester	**VI**
Course Name	**Computer Networks Lab**
Course Code	**15ECL68**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Illustrate the operations of network protocols and algorithms using C programming.
CO2	Utilize the network simulator for learning and practice of networking algorithms.
CO3	Built the network with different configurations to measure the performance parameters.
CO4	Develop the data link and routing protocols using C programming.
CO5	Develop wired and wireless LAN protocol using network simulator

Course Outcomes for VII SEM SUBJECTS	
Semester	**VII**
Course Name	**Computer communication Networks**
Course Code	**10EC71**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Illustrate the basic terminology of network and data communication system.
CO2	Experiment with different topologies and protocols of a computer network and assist in networking design and implementation.
CO3	Analyze the features of various application layer protocols by understanding the IP addressing to fulfill network requirements.
CO4	Construct a network model and determine the routing of packets using different routing algorithms.
CO5	Identify the functions of each layers of the OSI model and TCP/IP Model
Semester	**VII**
Course Name	**Optical Fiber Communication**
Course Code	**10EC72**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply the propagation of light in waveguide, recognize and categorize Optical fiber structures.
CO2	Build knowledge on the channel impairments like losses, dispersion along with various coupling losses and noise performance of the system.
CO3	Choose Optical sources, detectors, other components in optical fiber link and their different construction methods.
CO4	Make use of calculations of fiber optic systems, wave division multiplexing (WDM) concepts and gain the importance of the same.
CO5	Identify the different applications of optical amplifiers and learn the variety of networking aspects, FDDI, SONET/SDH.
Semester	**VII**
Course Name	**Power Electronics**
Course Code	**10EC73**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Interpret the basic operation of various power semiconductor devices used in modern industries as switching devices.
CO2	Develop the various Power converter circuits.
CO3	Build different firing circuitsused for different types of power converters.
CO4	Make use of commutation circuits used for different power electronic circuit applications.
CO5	Construct and implement inverter circuits used for different applications.

Semester	**VII**
Course Name	**Embedded System Design**
Course Code	**10EC74**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Interpret the meaning of Embedded system and also to understand how the hardware is built.
CO2	Utilization of memory in building the embedded system.
CO3	Development of embedded system.
CO4	Utililse the operating system in building the embedded system .
CO5	Apply the knowledge acquired to measure the performance of Embedded system build and also its optimization.
Semester	**VII**
Course Name	**DSP Algorithms & Architecture(Elective 2- Group B)**
Course Code	**10EC751**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply the fundamental principles of digital signal processing techniques, sampling theorem, architectural features of DSP devices and identifying various building blocks of programmable digital signal processor to achieve speed.
CO2	Identify architecture, software, and hardware features of TMS320C54xx processor. Acquire knowledge about various addressing modes of DSP TMS320C54XX and are able to program DSP processor.
CO3	Build the Q-notation to develop assembly level programming with an example. FIR and IIR filters on TMS320C54xx.
CO4	Model the implementation of interpolation and decimation on TMS320C54xx.
CO5	Examine the FFT and DFT computation in developing a TMS320C54xx assembly code to find DFT of a sequence
Semester	**VII**
Course Name	**Applied Embeded Systems Design(Elective -II (Group B)**
Course Code	**10EC755**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the techniques that are required to design an embedded system and have proficiency in both hardware and software.
CO2	Construct an embedded system around a microprocessor or DSP or microcontroller.
CO3	Understand networking of embedded systems , concepts of devices and communication buses for device network.
CO4	Understand the device drivers and interrupt servicing mechanism.
CO5	Identify architectural and implementation decisions that influence performance and power dissipation and produce efficient code for embedded systems.
Semester	**VII**
Course Name	**Image processing (Elective-III Group C)**

Course Code	**10EC763**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	understand the fundamentals of Digital Image processing.
CO2	make use of the concepts of Image sensing & acquisition using various sensors and its applications.
CO3	make use of different mathematical for Image Transformations.
CO4	Applying various techniques for image enhancement, restoration/degradation, compression and segmentation in different domains for greyscale images.
CO5	Applying various techniques for image enhancement, restoration/degradation, compression and segmentation in different domains for color Images.
Class	**ELECTRONICS AND COMMUNICATION ENGINEERING**
Semester	**VII**
Course Name	**VLSI Lab**
Course Code	**15ECL77**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Experiment with various digital circuits by simulating using Verilog Test bench
CO2	Built and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers.
CO3	Make use of transistors to design gates and further using gates realize shift registers and adders to meet desired parameters.
CO4	Make use of basic amplifiers and further design higher level circuits like operational amplifier and analog/digital converters to meet desired parameters.
CO5	Interpret concepts of DC Analysis, AC Analysis and Transient Analysis in analog circuits.
Class	**ELECTRONICS AND COMMUNICATION ENGINEERING**
Semester	**VII**
Course Name	**Power Electronics Lab**
Course Code	**10ECL78**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Make use of high Power to understand various type of power semiconductor devices.
CO2	Model the firing circuits using power semiconductor devices
CO3	Make use of firing circuits model to analyze different types of power converters.
CO4	Make use of power converter to realize the working of DC and AC motors drives
CO5	Select the suitable Power Converter and Firing Ciricuits using Pspice software.

Course Outcomes for VIII SEM SUBJECTS	
Semester	**VIII**
Course Name	**wireless communication**
Course Code	**10EC81**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	To understand the concept of wireless communication system through different generations
CO2	Able to select and study cellular system components , its identification and fundamentals
CO3	Identifying various accessing schemes and gain knowledge on GSM architecture and operations
CO4	Make use of CDMA , TDMA technology in utilizing the various accessing schemes
CO5	Apply the basic knowledge in solving the path loss model and coding techniques
Semester	**VIII**
Course Name	**DIGITAL SWITCHING SYSTEMS**
Course Code	**10EC82**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the basic concepts and parameters of telecommunication networks and services.
CO2	Identify the evolution of switching system, its architecture and operation.
CO3	Model the traffic flow in lost call systems and queuing systems.
CO4	Organize the digital switching software architecture for various levels of control.
CO5	Identify the software aspects of switching systems and its maintenance.
Semester	**VIII**
Course Name	**GSM**
Course Code	**10EC843**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the need for network security and understand the conventional encryption
CO2	Plan to learn Public-key encryption and Hash Functions used in cryptography
CO3	Make use of Digital signature for providing the authentication in network security
CO4	Apply the different methods for intrusion detection and relate the techniques for data protection
CO5	Choose the OSI model used in network security and identify the effect of virus and show the use of firewalls in networks

Semester	**VIII**
Course Name	**Network Security**
Course Code	**10EC832**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain the need of mobile communication,architectural features, radio link capability and use of smart antennas in cellular communication of GSM.
CO2	Relate the need of speech coding and different services available in GSM.
CO3	Identify the data services, Handover in GSM, process of authorization and authentication in cellular communication.
CO4	Identify process of authorization and authentication in cellular Communication.
CO5	Apply need for planning in mobile technology and the drawbacks of GSM yielding to future scope.
	PG Courses
	Ist sem
Course Name	**Advanced Mathematics**
Course Code	**14ELD11**
CO1	Understand vector spaces, basis, linear transformations and the process of obtaining matrix linear and transformations arising in magnification and rotation of images.
CO2	Apply the technique of singular value decomposition for data compression, least square approximation in solving inconsistent linear systems.
CO3	Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits.
CO4	Learn the idea of random variables (discrete/continuous) and probability distributions in analyzing the probability models arising in control systems and system communications.
CO5	Analyze random process through parameter-dependent variables in various random processes.
Course Name	**Antenna Theory and Design**
Course Code	**14ECS12**
CO1	Classify different types of antennas
CO2	Define and illustrate various types of array antennas
CO3	Design antennas like Yagi-Uda, Helical antennas and other broad band antennas
CO4	Describe different antenna synthesis methods
CO5	Apply methods like MOM

Course Name	**Probability and Random process**
Course Code	**14CS13**
CO1	Understand the basics of probability, events, sample space and how to use them to real life problems
CO2	2. Understand and analyze the random variables, random functions and operations
CO3	1. Understand and analyze the multiple random variables and relate through examples to real problems.
CO4	Understand and analyze the concept of random processes such as Markov processes, Gaussian Processes, Poisson Processes
CO5	Apply the concepts of probabilities in engineering applications such as communications; signal processing, control systems, computer networks, and Telephone networks.
Course Name	**Advanced Digital Communication**
Course Code	**14ECS14**
CO1	understand digital modulation formats.
CO2	understand M-ray modulation techniques, Power spectra, Bandwidth efficiency
CO3	Analyse systematic and non systematic convolution codes
CO4	Analyse adaptive equalization for differnet coding systems
CO5	Analyse diversity techniques for fading multipath channels.
Course Name	**Wireless and Mobile Networks**
Course Code	**14CS151**
CO1	understand wireless channel systems and its specifications
CO2	understand wireless networks issues and standards.
CO3	Analyse the design issues in wireless systems.
CO4	Analyse research issues in wireless networks.
CO5	Analyse wireless adhoc networks, VANET's.
	2nd Sem
Course Name	**Wireless Communication**
Course Code	**14ECS21**
CO1	Explain the concepts of multi-channel signaling (including OFDM) scheme and synchronization for carrier and symbol timing recovery at receiver.
CO2	Evaluate the capacity and degradation in performance of various symbol signaling schemes in a multipath fading environment.
CO3	Develop & analyze schemes to improve performance in a multipath fading environment including maximal ratio combining, RAKE RF and Microwave Circuit Design

CO4	Develop and evaluate the performance of aOFDM MIMO scheme to meet specified rate in a given multipath environment.
CO5	Develop and evaluate the performance of OFDM scheme.

Course Name	**RF and Microwave Circuit Design**
Course Code	**14ECS22**
CO1	Explain the concepts of microwavesignals ,Wave propagation in network and its application.:
CO2	Expalining the concepts & properties of S matrix and eevaluate the stacbility concepts using smith chart
CO3	Analysing the concepts of linear and non-linears amplifiers
CO4	Analysing the concepts of microwave devices
CO5	Evaluate the functioning of Microwave IC's.
Course Name	**Modern DSP**
Course Code	**14ECS23**
CO1	Analyse signals, systems, concept of frequency domain transformations.
CO2	Design of IIR filters from frwquency transformations
CO3	Analyse interpolation and sampling rate conversions.
CO4	Evaluate the adaptive filters and its applications
CO5	Evaluate the RLS algorithm for various applications.
Course Name	**Optical Communication and Networking**
Course Code	**14ECS24**
CO1	Identify different modes of signal propagation and losses of optical fibre
CO2	Construct the working principle of optical connectors,multiplexures and amplifiers
CO3	Develop the modulation and demodulation in optical Communication
CO4	Analyse networking aspects of optical fibre and various standards associated with it
CO5	Explain different WDM elements and control and Management functions

Course Name	**Advanced Embedded system**
Course Code	**14ECS253**
CO1	Understand the core of the embeded system, sensors and actuators
CO2	Develop hardware software codesign and program modelling
CO3	Analyse embedded firmware design approaches.
CO4	Evaluate the types of files generated in cross compilation
CO5	Evaluate the trends in the embedded industry

Course Outcomes for 2017-18 Courses	
Class	**MECHANICAL ENGINEERING**
Semester	**III**
Course Name	**Engineering Mathematics – III**
Course Code	**15MAT31**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Make use of Fourier series to analyze wave forms of periodic functions
CO2	Make use of Fourier transforms and Z - transforms to analyze wave forms of non periodic functions
CO3	Identify statistical methods to find correlation and regression lines, also numerical methods to solve transcendental equations.
CO4	Utilize Numerical techniques for various finite difference technique problems
CO5	Construct Greens, divergence and Stokes theorems for various engineering applications
Class	**MECHANICAL ENGINEERING**
Semester	**III**
Course Name	**Materials Science**
Course Code	**15ME32**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Interpret the basic concepts of crystal structure, concepts of diffusion, mechanical behavior of materials and various modes of failure.
CO2	Classify solid solutions, interpret equilibrium phase diagrams of ferrous and nonferrous alloys and mechanism of solidification.
CO3	Relate suitable heat-treatment process to achieve desired properties of metals and alloys
CO4	Interpret the properties and applications of various materials like ceramics, plastics and Smart materials.
CO5	Identify various composite materials and their processing as well as applications.
Class	**MECHANICAL ENGINEERING**
Semester	**III**
Course Name	**Basic Thermodynamics**
Course Code	**15ME33**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain thermodynamic systems, properties, Zeroth law of thermodynamics, temperature scales and energy interactions
CO2	Determine heat, work, internal energy, enthalpy for flow & non flow process using First and Second Law of Thermodynamics
CO3	Interpret behavior of pure substances and its applications to practical problems
CO4	Determine change in internal energy, change in enthalpy and change in entropy using TD relations for ideal gases
CO5	Calculate Thermodynamics properties of real gases at all ranges of pressure, temperatures using modified equation of state including Vander Waals equation, Redlich Wong equation and Beattie

Class	**MECHANICAL ENGINEERING**
Semester	**III**
Course Name	**Mechanics of Materials**
Course Code	**15ME34**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand simple, compound, thermal stresses and strains their relations, Poisson's ratio, Hooke's law, mechanical properties including elastic constants and their relations.
CO2	Determine plane stress, principal stress, maximum shear stress and their orientations using analytical method and Mohr's circle
CO3	Draw SFD and BMD for different beams including cantilever beams, simply supported beams and overhanging beams subjected to UDL, UVL, Point loads and couples
CO4	Determine dimensions, bending stress, shear stress and its distribution in beams of circular, rectangular, symmetrical I and T sections subjected to point loads and UDL
CO5	Determine the dimensions of shafts based on torsional strength, rigidity and flexibility and also elastic stability of columns using Rankin's and Euler's theory
Class	**MECHANICAL ENGINEERING**
Semester	**III**
Course Name	**Metal Casting and Welding**
Course Code	**15ME35A**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Classify the casting process, different moulding techniques, pattern, Core, and Gating, Riser system and Molding Machines.
CO2	Explain working and parameters of different furnaces and the different casting Techniques
CO3	Illustrate about the Solidification process in and Casting of ferrous and Non-Ferrous Metals
CO4	Make use of the knowledge of the welding process used in manufacturing
CO5	Make use of the Metallurgical aspects in Welding and inspection Methods for the quality assurance of components made of casting and joining process in the manufacturing industry

Class	**MECHANICAL ENGINEERING**
Semester	**III**
Course Name	**Computer Aided Machine Drawing**
Course Code	**15ME36A**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Sections of pyramids, prisms, cubes, cones and cylinders resting on their bases in 2D Orthographic views of machine parts with and without sectioning in 2D.
CO2	Hexagonal and square headed bolt and nut with washer, stud bolts with nut and lock nut, flanged nut, slotted nut, taper and split pin for locking counter sunk head screw, grub screw, Allen screw assemblies in 2D
CO3	single and double riveted lap joints, butt joints with single/double cover straps, cotter and knuckle joint for two rods in 2D
CO4	Sketch split muff, protected type flanged, pin type flexible, Oldham's and universal couplings in 2D
CO5	assemblies from the part drawings with limits ,fits and tolerance given for Plummer block, Ram bottom safety valve, I.C. Engine connecting rod, Screw Jack, Tailstock of lathe, Machine Vice and Lathe square tool post in 2D and 3D
4TH SEMESTER	
Class	**MECHANICAL ENGINEERING**
Semester	**IV**
Course Name	**ENGG. MATHEMATICS – IV**
Course Code	**15MAT41**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply Numerical methods to obtain the solution of fist order and first degree differential equations.
CO2	Make use of probability theory on discrete and continuous random variables to obtain the solution of problems on different distributions and joint probability distribution.
CO3	Identify the problems on sampling distribution and on markov chains in attempting the engineering problems for feasible random events.
CO4	Utilize the Bessel's and Legendre functions for the problems arising in engineering fields.
CO5	Construct the analytic functions. Calculate residues and poles of complex potentials in flow problems.

Class	**MECHANICAL ENGINEERING**
Semester	**IV**
Course Name	**KINEMATICS OF MACHINES**
Course Code	**15ME42**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the basic terminology of planar mechanisms and their motion study
CO2	Construct velocity and acceleration diagrams for planar mechanisms by Graphical method
CO3	Apply complex algebra method for velocity and acceleration analysis for planar mechanisms
CO4	Analyze the transmission of power by application of various gears and gear trains.
CO5	Model displacement diagrams for followers with various types of motions and Cam profile drawing for various followers
Class	**MECHANICAL ENGINEERING**
Semester	**IV**
Course Name	**APPLIED THERMODYNAMICS**
Course Code	**15ME43**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the basic thermodynamic cycles like otto, Diesel, Dual and gas turbine cycles applied in IC engine and gas turbine Applications.
CO2	Apply Basic thermo dynamic cycles used in the steam power plants for power productions based on Rankine cycle
CO3	Build combustion parameters for correct heat combustion for given air fuel ratio, efficiency calculations along with performance and testing of IC Engines
CO4	Construct refrigeration systems based on various refrigeration cycles along with air conditioning systems
CO5	Illustrate the basic formulations for reciprocating compressors and steam nozzles for efficiency and effect of friction
Class	**MECHANICAL ENGINEERING**
Semester	**IV**
Course Name	**FLUID MECHANICS**
Course Code	**15ME44**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply the key fluid properties used in the analysis of fluid behavior
CO2	Apply the knowledge of fluid statics, kinematics and dynamics while addressing problems of Mechanical Engineering
CO3	Apply the principles of fluid kinematics and dynamics to study the fluid flow through pipes
CO4	Make use of the concept of boundary layer in fluid flow and apply dimensional analysis to form dimensionless numbers in terms of input - output variables.
CO5	Make use of the basic concept of compressible flow and CFD to solve industrial related gas turbine and engines problems

Class	**MECHANICAL ENGINEERING**
Semester	**IV**
Course Name	**MACHINE TOOLS & OPERATION**
Course Code	**15ME45B**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain the construction & specification of various machine tools
CO2	Describe various machining processes pertaining to relative motions between tool & work piece
CO3	Discuss different cutting tool materials, tool nomenclature & surface finish
CO4	Apply mechanics of machining process to evaluate machining time.
CO5	Analyze tool wear mechanisms and equations to enhance tool life and minimize machining cost.

Class	**MECHANICAL ENGINEERING**
Semester	**IV**
Course Name	**MECHANICAL MEASUREMENT & METROLOGY**
Course Code	**15ME46B**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the basics standards of measurements like slip gauges for angle and length measurement
CO2	Apply the prinicples of limits, fit sand tolerances for design of gauges
CO3	Apply the principles of measurement systems to measure different parameters of gears &screw threads
CO4	Demonstrate the use of transducers,electrical intermediate modifying devices,Electronic amplifiers&terminating devices
CO5	Make use of methods of measurements to measure torque, force and tempertaure
Class	**MECHANICAL ENGINEERING**
Semester	**IV**
Course Name	**MECHANICAL MEASUREMENTS AND METROLOGY LAB**
Course Code	**15MEL37 B / 47B**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	To calibrate pressure gauge, thermocouple, LVDT, load cell, micrometer
CO2	To measure angle using Sine Center/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set.
CO3	To measure cutting tool forces using Lathe/Drill tool dynamometer
CO4	To measure Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth vernier/Gear tooth micrometer
CO5	To measure surface roughness using Tally Surf/ Mechanical Comparator.

Class	**MECHANICAL ENGINEERING**
Semester	**III/IV**
Course Name	**MATERIALS TESTING LAB**
Course Code	**15MEL37 A / 47A**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Acquire experimentation skills in the field of material testing.
CO2	Develop theoretical understanding of the mechanical properties of materials by performing experiments
CO3	Apply the knowledge to analyze a material failure and determine the failure inducing agent/s.
CO4	Apply the knowledge of testing methods in related areas.
CO5	Know how to improve structure/behavior of materials for various industrial applications
Class	**MECHANICAL ENGINEERING**
Semester	**III/IV**
Course Name	**FOUNDRY AND FORGING LAB**
Course Code	**15MEL38A / 48A**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Demonstrate various skills of sand preparation, molding
CO2	Demonstrate various skills of forging operations
CO3	Work as a team keeping up ethical principles
CO4	
CO5	

Class	**MECHANICAL ENGINEERING**
Semester	**III/IV**
Course Name	**MACHINE SHOP**
Course Code	**15MEL38B / 48B**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Perform turning , facing , knurling , thread cutting, tapering , eccentric turning and allied operations
CO2	Perform gear tooth cutting using milling machine
CO3	Understand the formation of cutting tool parameters of single point cutting tool using bench grinder / tool and cutter grinder
CO4	Understand Surface Milling/Slot Milling
CO5	Exhibit interpersonal skills towards working in a team
5TH SEMESTER	
Class	**MECHANICAL ENGINEERING**
Semester	**V**
Course Name	**Management and Engineering Economics**
Course Code	**15ME51**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand needs, functions, roles, scope and evolution of Management, importance, purpose of Planning and hierarchy of planning and also analyze its types
CO2	Discuss Decision making, Organizing, Staffing, Directing and Controlling
CO3	Select the best economic model from various available alternatives
CO4	Understand various interest rate methods and implement the suitable one & Estimate various depreciation values of commodities
CO5	Prepare the project reports effectively
Class	**MECHANICAL ENGINEERING**
Semester	**V**
Course Name	**Dynamics of Machinery**
Course Code	**15ME52**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Design centrifugal governors and understand the gyroscopic effect on ships, aeroplanes & vehicles
CO2	Build the concept of balancing rotating and reciprocating parts in machinery
CO3	Identify the effect of static and dynamic equilibrium of forces in planar mechanisms
CO4	Examine the concept of SHM and interpret natural frequencies of Undamped free vibrations.
CO5	Inspect the nature of damped free vibrations, Forced vibration of single degree freedom systems
Class	**MECHANICAL ENGINEERING**
Semester	**V**
Course Name	**Turbo Machines**
Course Code	**15ME53**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Able to give precise definition of turbomachinery & various types of turbo machinery
CO2	Apply the Euler's equation for turbomachinery to analyse energy transfer in turbomachines
CO3	Understand the principle of operation of pumps, fans, compressors and turbines.
CO4	Perform the preliminary design of turbomachines (pumps, rotary compressors and turbines)
CO5	Analyze the performance of turbo machinery

Class	**MECHANICAL ENGINEERING**
Semester	**V**
Course Name	**Design of Machine Elements - I**
Course Code	**15ME54**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Describe the design process, choose materials, codes and standards in design process
CO2	Analyze the behavior of machine components under static, impact, fatigue loading using failure theories.
CO3	Design shafts, joints, couplings
CO4	Design of riveted and welded joints.
CO5	Design of threaded fasteners and power screws
Class	**MECHANICAL ENGINEERING**
Semester	**V**
Course Name	**Non Traditional Machining**
Course Code	**15ME554**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the compare traditional and non-traditional machining processand recognize the need for Non-traditional machining process.
CO2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM.
CO3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations
CO4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM
CO5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM.

Class	**MECHANICAL ENGINEERING**
Semester	**V**
Course Name	**Project Managemet**
Course Code	**15ME564**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the selection, prioritization and initiation of individual projects and strategic role of project management
CO2	Understand the work breakdown structure by integrating it with organization and uncertainty in projects
CO3	Students will be able to understand risk management planning using project quality tools
CO4	Understand the activities like purchasing, acquisitions, contracting, partnering and collaborations related to performing projects
CO5	Draw the network diagram to calculate the duration of the project and reduce it using crashing.
Class	**MECHANICAL ENGINEERING**
Semester	**V**
Course Name	**FLUID MECHANICS & MACHINERY LAB**
Course Code	**15MEL57**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Perform experiments to determine the coefficient of discharge of flow measuring devices.
CO2	Conduct experiments on hydraulic turbines and pumps to draw characteristics
CO3	Test basic performance parameters of hydraulic turbines and pumps and execute the knowledge in real life situations
CO4	Determine the energy flow pattern through the hydraulic turbines and pumps
CO5	Exhibit his competency towards preventive maintenance of hydraulic machines
Class	**MECHANICAL ENGINEERING**
Semester	**V**
Course Name	**ENERGY LAB**
Course Code	**15MEL58**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Perform experiments to determine the properties of fuels and oils.
CO2	Test basic performance parameters of I.C. Engine and implement the knowledge in industry
CO3	Identify exhaust emission, factors affecting them and report the remedies
CO4	Determine the energy flow pattern through the I C Engine
CO5	Exhibit his competency towards preventive maintenance of IC engines.
6TH SEMESTER	
Class	**MECHANICAL ENGINEERING**
Semester	**VI**
Course Name	**Finite Element Analysis**
Course Code	**15ME61**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the basic procedures implemented in FEM along with reduction of execution time and memory requirements for given engineering problem
CO2	Construct the basic algorithms or numerical procedures to solve simple bar and truss problems subjected to axial loading
CO3	Make use of finite element matrix to solve lateral and torsional loaded members confined to regular shapes
CO4	Construct the fundamental numerical procedures required to solve thermal and fluid flow problems confined to simple loading conditions
CO5	Construct the mass and stiffness matrix to solve dynamic problems along with axisymmetric ring elements

Class	**MECHANICAL ENGINEERING**
Semester	**VI**
Course Name	**Computer integrated Manufacturing**
Course Code	**15ME62**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply the knowledge of mathematical models of automation in production systems and automated flow lines, to optimize the process of CAD/CAM/CIM
CO2	Solve the simple problems of transformations of entities on computer graphics and process planning of material requirement, quality and shop floor control
CO3	Identify the applications of flexible manufacturing systems, AS/RS and solve the problems on line balancing methods
CO4	Develop the programs using G codes and M codes for CNC machines tools and robotics in industrial applications
CO5	Explain the concept of various additive manufacturing technologies and Internet of Things (IOT)
Class	**MECHANICAL ENGINEERING**
Semester	**VI**
Course Name	**Heat Transfer**
Course Code	**15ME63**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the three modes of heat transfer and construct conduction heat transfer equations for composite bodies make use of both sizing and rating methods
CO2	Construct the fins to enhance heat transfer from a surface and solve for unsteady heat conduction rate
CO3	Select the type of correlation to be used suitably so as to experiment with convection heat transfer coefficient for various applications
CO4	Utilize the methods, to find the exit temperature of fluid and size of heat exchangers, also identify the effect of cavitation and fouling due to boiling and condensation of fluid
CO5	Analyze two-dimensional heat conduction equations and examine the radiation heat transfer rate from black bodies, real surfaces and thermal shield
Class	**MECHANICAL ENGINEERING**
Semester	**VI**
Course Name	**Design of Machine Elements -II**
Course Code	**15ME64**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Solve the state of art problems relating to springs and different types of drives
CO2	Make use of beam analysis to design the different gear systems
CO3	Solve problems pertaining to clutches and brakes
CO4	Select a journal/antifriction bearing for mechanical application
CO5	Apply the concepts of stress- strain analysis to curved beam and cylinders
Class	**MECHANICAL ENGINEERING**
Semester	**VI**
Course Name	**Metal Forming**
Course Code	**15ME653**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Utilize the basic and unique characteristics of metals that lead to plastic deformation as a processing strategy in metal working
CO2	Indentify the effect of process parameters on the process mechanics during bulk metal forming
CO3	Apply metal forming processes like drawing and Rolling to get the knowledge of manufacturing the product
CO4	Choose the approaches to indentify steps involved to manufacture product by Extrusion & Sheet Metal Forming process
CO5	Indentify the methods and applications in High Energy Rate Forming Methods & Powder Metallurgy
Class	**MECHANICAL ENGINEERING**

Semester	**VI**
Course Name	**Total Quality Management**
Course Code	**15ME664**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand various approaches to TQM and Quality Management systems
CO2	Understand the characteristics of quality leader and his role
CO3	Role of employee involvement and customer satisfaction by design feedback systems
CO4	Improve the quality in organization using Continuous Process Improvement techniques and Statistical Process Control tools
CO5	Enhance the knowledge in Tools and Techniques of quality management
Class	**MECHANICAL ENGINEERING**
Semester	**VI**
Course Name	**Heat Transfer Lab**
Course Code	**15MEL67**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values
CO2	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin
CO3	Determine surface emissivity of a test plate
CO4	Estimate performance of a refrigerator and effectiveness of fin
CO5	Calculate temperature distribution of study and transient heat conduction through plane wall, cylinder and fin using numerical approach.
Class	**MECHANICAL ENGINEERING**
Semester	**VI**
Course Name	**Modeling and Analysis Lab (FEA)**
Course Code	**15MEL68**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Demonstrate the basic features of an analysis package
CO2	Use the modern tools to formulate the problem, and able to create geometry, descritize, apply boundary condition to solve problems of bars, truss, beams, plate to find stress with differentloading conditions
CO3	Demonstrate the deflection of beams subjected to point, uniformly distributed and varying loads further to use the available results to draw shear force and bending moment diagrams
CO4	Analyze the given problem by applying basic principle to solve and demonstrate 1D and 2D heat transfer with conduction and convection boundary conditions
CO5	Carry out dynamic analysis and finding natural frequencies for various boundary conditions and also analyze with forcing function
7TH SEMESTER	
Class	**MECHANICAL ENGINEERING**
Semester	**VII**
Course Name	**Engineering Economy**
Course Code	**10ME71**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Summarize the basic concepts of thermal energy systems, renewable energy sources and their utilization
CO2	Understand the basic concepts of solar radiation and analyze the working of solar PV and thermal systems.
CO3	Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, biogas
CO4	Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator.
CO5	Identify methods of energy storage for specific applications

Class	**MECHANICAL ENGINEERING**
Semester	**VII**
Course Name	**Mechanical Vibrations**
Course Code	**10ME72**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Formulate the mathematical models in vibrations using different principles for undamped and damped mechanical Systems
CO2	Determine solution for damped free vibrations systems and infer the solutions for different amount of damping
CO3	Interpret the physical and design considerations of forced vibrations and isolators in Vibration and frequency measuring instruments Interpret the physical and design considerations of forced vibrations and isolators in Vibration and frequency measuring instruments
CO4	Analyze the critical speed of shaft and determine the principle mode of vibration for two DOF systems
CO5	Evaluate the natural frequencies of Multi DOF Systems using various numerical techniques
Class	**MECHANICAL ENGINEERING**
Semester	**VII**
Course Name	**Hydraulics And Pneumatics**
Course Code	**10ME73**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Describe the working principle and performance parameters of various hydraulic and pneumatic components and systems
CO2	Design hydraulic and pneumatic circuits for mechanical engineering applications
CO3	Analyze performance evaluation of fluid power systems and propose improvements
CO4	Illustrate self-learning capability in the field of Fluid Power Systems.
CO5	Students to select the appropriate hydraulic and pneumatic actuating system for the different integrated applications.
Class	**MECHANICAL ENGINEERING**
Semester	**VII**
Course Name	**Operation Research**
Course Code	**10ME74**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research.
CO2	Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO3	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems
CO4	Construct networkdiagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO5	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3machines,n jobs-m machinesand 2 jobs-n machines using Johnson's algorithm.
Class	**MECHANICAL**
Semester	**VII**
Course Name	**Theory Of Plasticity**
Course Code	10ME752
At the end of this course, the student will be able to:	
Course Outcome #	**MECHANICAL ENGINEERING**
CO1	Understand stress, strain, deformations, relation between stress and strain and plastic deformation in solids
CO2	Understand plastic stress-strain relations and associated flow rules
CO3	Perform stress analysis in beams and bars including Material nonlinearity
CO4	Analyze the yielding of a material according to different yield theory for a given state of stress
CO5	Interpret the importance of plastic deformation of metals in engineering problems.

Class	**MECHANICAL**
Semester	**VII**
Course Name	**Total Quality Management**
Course Code	**10ME758**
At the end of this course, the student will be able to:	
Course Outcome #	**MECHANICAL ENGINEERING**
CO1	Understand the philosophy and core value to TQM and to determine the voice of customers and its impact on quality.
CO2	Apply and evaluate best practices for attainment of total quality
CO3	Understand the methodologies to enhance the management process such as bench marking, business process reengineering
CO4	Choose the framework to evaluate the performance excellence of organization and to determine the set of performance indicators
CO5	Measure cost of poor quality and to identify the areas of improvement.

Class	**MECHANICAL**
Semester	**VII**
Course Name	**Experimental Stress Analysis**
Course Code	**10ME761**
At the end of this course, the student will be able to:	
Course Outcome #	**MECHANICAL ENGINEERING**
CO1	Define various phenomenon and properties associated with light and photo elastic materials
CO2	Identify different strain gauges and rossette.
CO3	Explain and illustrate the principles for measuring strain
CO4	Apply the concept of photo elasticity, strain gauge circuit and rosette for the calculation of stress in the given component under different loading conditions
CO5	Investigate different methods of calibration and compensation techniques to improve the accuracy of strains being measured
Class	**MECHANICAL**
Semester	**VII**
Course Name	Tool Design
Course Code	10ME762
At the end of this course, the student will be able to:	
Course Outcome #	**MECHANICAL ENGINEERING**
CO1	Describe general requirements of machine tools
CO2	Use control systems for forming and auxiliary motions in machine tools.
CO3	Analyze types of design problems such as gear box design, guide way design, shaft loading and its associated parts.
CO4	Design machine tool parts
CO5	Evaluate the forces generated by cutting tools.
Class	**MECHANICAL**
Semester	**VII**
Course Name	Design Laboratory
Course Code	10MEL77
At the end of this course, the student will be able to:	
Course Outcome #	**MECHANICAL ENGINEERING**
CO1	To **understand** the working principles of machine elements such as Governors, Gyroscopes etc.
CO2	To **identify** forces and couples in rotating mechanical system components.
CO3	To **identify** vibrations in machine elements and design appropriate damping methods and to determine the critical speed of a rotating shaft
CO4	To **identify** the strain induced in a structural member using the principle of photo-elasticity.
CO5	To **determine** the minimum film thickness, load carrying capacity, frictional torque and pressure distribution of journal bearing

Class	**MECHANICAL**
Semester	**VII**
Course Name	CIM & Automation Lab
Course Code	10MEL78
At the end of this course, the student will be able to:	
Course Outcome #	**MECHANICAL ENGINEERING**
CO1	Given a English language description of the problem &/or a schematic representation of the problem, Identify the various Manufacturing process associated with the problem & develop an initial generic solution using the G & M codes
CO2	Identify & virtually simulate various concepts of CIM such as CNC, FMS, Automation, Industrial Robots, ASRS and Hydraulics & Pneumatics
CO3	Apply the manufacturing specific G & M codes to the given problem & to simulate the same using the FANUC Package
CO4	Analyse the simplicity/complexity of the problem. Breakdown the sequence of manufacturing process & task involved.
CO5	Develop a Program for the Robot & CNC to execute various tasks and manufacturing process respectively considering the manufacturing & task precedence constraints
8TH SEMESTER	
Class	**MECHANICAL ENGINEERING**
Semester	**VIII**
Course Name	Operation Management
Course Code	10ME81
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Gain an understanding and appreciation of principles and applications relevant to planning, design and operation of manufacturing/ service firms
CO2	Develop necessary skills to effectively analyze and synthesize many inter-relationship in production systems.
CO3	Gain ability to recognize the situations in production systems environment that suggests use of quantitative methods to assist in decision making
CO4	Understand aggregate planning and master scheduling techniques
CO5	Choose a frame work of inventory control and enterprise resource planning through MRP-II
Class	**MECHANICAL ENGINEERING**
Semester	**VIII**
Course Name	Control Engineering
Course Code	10ME82
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify various test signals, compensators and control systems.
CO2	Develop mathematical models for simulation of mechanical, electrical and hydraulic control systems in order to obtain system response for given input test signals
CO3	Integrate each sub system for a desired control system and obtain the relevant transfer functions
CO4	Predict the stability of a control system employing nyquist, polar, bode and root locus plots as stability criteria.
CO5	Develop block diagrams and signal flow graphs for different applications of control system.
Class	**MECHANICAL ENGINEERING**
Semester	**VIII**
Course Name	Tribology
Course Code	10ME831
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Realize and describe the mechanisms of lubrication in bearings.
CO2	Compute load carrying capacity in light and heavy loaded journal bearings.
CO3	Analyze the friction force and power loss in hydrodynamic and hydrostatic lubrication.
CO4	Identify the appropriate material for bearings based on the application.
CO5	Recognize the different wear regimes in tribological components

Class	**MECHANICAL ENGINEERING**
Semester	**VIII**
Course Name	Automotive Engineering
Course Code	10ME844
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the different self-propelled systems that are employed in the design of the automobile
CO2	Distinguish the properties of fuels and lubricants, fuel supply systems that are ideal for the operations of an i.c engine.
CO3	Able to apply the concept of power trains, drive to wheels, suspension and braking systems to achieve better controllability of an automobile.
CO4	Hypothesize the formation of automobile pollutions in si and ci engines and improve the performance of automotive system through various test procedures and enhancing techniques
CO5	Assess the construction, working principle of various types of transmissions of an automobile.
PG Courses	
Class	**MECHANICAL ENGINEERING**
Semester	**I**
Course Name	Advanced Mathematics
Course Code	14ELD11
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand vector spaces, basis, linear transformations and the process of obtaining matrix linear and transformations arising in magnification and rotation of images.
CO2	Apply the technique of singular value decomposition for data compression, least square approximation in solving inconsistent linear systems.
CO3	Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits.
CO4	Learn the idea of random variables (discrete/continuous) and probability distributions in analyzing the probability models arising in control systems and system communications.
CO5	Analyze random process through parameter-dependent variables in various random processes.
Class	**MECHANICAL ENGINEERING**
Semester	**I**
Course Name	**FINITE ELEMENT METHOD**
Course Code	**16MDE12**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the knowledge of FEM as a numerical method for the solution of solid mechanics,
CO2	**Apply** the knowledge of FEM as a numerical method for the solution of structural mechanics.
CO3	**Apply** the knowledge of FEM as a numerical method for the solution of thermal problems.
CO4	**Apply** the knowledge of FEM as a numerical method for the solution of vibration problems.
CO5	**Plan** to develop skills required to use a commercial FEA software.
Class	**MECHANICAL ENGINEERING**
Semester	**I**
Course Name	**Continuum Mechanics**
Course Code	**16CAE13**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the knowledge of Continuum Mechanics as a Theoretical method for the solution of solid mechanics problems,
CO2	**Apply** the knowledge of Continuum Mechanics as a Theoretical method for the solution of structural mechanics.
CO3	**Apply** the knowledge of Continuum Mechanics as a Theoretical method for the solution of thermal problems.

CO4	**Apply** the knowledge of Continuum Mechanics as a Theoretical method for the solution of Rotating members.
CO5	**Plan** to develop skills required to use a commercial Continuum Mechanics software.
Class	**MECHANICAL ENGINEERING**
Semester	**I**
Course Name	**EXPERIMENTAL MECHANICS**
Course Code	**16CAE16**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Understand** the concepts of measurements
CO2	**Analyze** the concepts of strain rossets
CO3	**Apply** the knowledge 2D photo elasticity for stress determination
CO4	**Apply** the knowledge 3D photo elasticity for stress determination
CO5	**Analyze** the Concepts of holograpgy

Class	**MECHANICAL ENGINEERING**
Semester	**I**
Course Name	**Mechatronics System Design**
Course Code	**16MDE153**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the knowledge of Mechatronic concepts in the solution of engineering problems.
CO2	**Apply** the knowledge of Mechatronic Concepts in integrating mechanical elements with electronic components.
CO3	**Apply** the knowledge of mechatronics as a combination of electronics and mechanical elements with software elements
CO4	**Apply** the knowledge of Mechatronics in usage of sensor design in industrial applications.
CO5	**Plan** to develop skills required to use Applications based on Mecatronic principles.
Class	**MECHANICAL ENGINEERING**
Semester	**I**
Course Name	**Design Engineering Lab I**
Course Code	**16MDE16**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the knowledge of Finite element concepts in the solution of one dimensional problems using commercial softwares.
CO2	**Apply** the knowledge of Finite element Concepts in the solution of thermal problems.
CO3	**Apply** the knowledge of Finite element software's in the application of finding the system stability through frequency analysis.
CO4	**Apply** the knowledge of Finite element methods in building the solution for mechanical problems through virtual simulation techniques.
CO5	Plan to develop skills required to standardize software codes for standard engineering problems
Class	**MECHANICAL ENGINEERING**
Semester	**II**
Course Name	**COMPOSITE MATERIALS TECHNOLOGY**
Course Code	**16MST21**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Understand** the specifics of mechanical behavior of layered composites compared to isotropic materials
CO2	**Apply** constitutive equations of composite materials and understand mechanical behavior at micro level.
CO3	**Determination** of stresses and strains in composites
CO4	**Analyze** and apply the different composites in various mechanical application
CO5	**Analyze** the failures in composite materials and its testing
Class	**MECHANICAL ENGINEERING**
Semester	**II**
Course Name	**ADVANCED MACHINE DESIGN**
Course Code	**16MDE22**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the concepts of theory of failure for estimating the life of the structure
CO2	**Analyze** the concepts of stress-life approach
CO3	**Apply** the knowledge of LEFM concepts
CO4	**Apply** the concepts of life estimation for varying loads
CO5	**Analyze** the effect of surface wear in design of materials

Class	**MECHANICAL ENGINEERING**
Semester	**II**
Course Name	**DYNAMICS AND MECHANISM DESIGN**
Course Code	**16MDE23**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the knowledge of Mechanism principles to find the type of mechanism and the associated degree of freedom.
CO2	**Apply** the knowledge of principles of mechanism to form a new mechanism from existing mechanisms.
CO3	**Apply** the knowledge of Mechanism principles to estimate the movements and rotations for the given angular rotation of the crank.
CO4	**Apply** the knowledge of Mechanism principles to find the duplicate or cognate linkages for the same drive input.
CO5	**Plan** to develop skills required to form a commercial dynamic linkages software.

Class	**MECHANICAL ENGINEERING**
Semester	**II**
Course Name	**ADVANCED THEORY OF VIBRATIONS**
Course Code	**16MDE24**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the knowledge of Vibration principles to find the degree of freedom solution for the continuum system
CO2	**Apply** the knowledge of advanced principles of Vibrations to built Vibration control systems.
CO3	Apply the knowledge of Vibrations to find the response under transient vibrations which helps in selecting the dampers to reduce the extent of vibration.
CO4	**Apply** the knowledge of vibration principles to find the nonlinear response of the systems due to either seismic or road vibrations.
CO5	**Plan** to develop skills required to form commercial software to find the response of the mechanical systems under various vibration loads.
Class	**MECHANICAL ENGINEERING**
Semester	**II**
Course Name	**Theory of Plasticity**
Course Code	**16MDE252**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the knowledge of stress, strain and stress strain relation from Theory of elasticity.
CO2	**Apply** the knowledge of plastic deformation and its related theories.
CO3	**Apply** the knowledge of Yield criteria and to study Tresca and Vonmises Yield criteria
CO4	**Apply** the knowledge of materials to study the behavior of different materials under loading, Solution to the problems
CO5	**Apply** the knowledge of slip line theory, continuity equation to understand formulation of plasticity problems.
Class	**MECHANICAL ENGINEERING**
Semester	**II**
Course Name	**DESIGN ENGINEERING LAB-II**
Course Code	**16MDE26**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	**Apply** the knowledge of Finite element based commercial software ansys to find engineering solutions for composite structures subjected to various structural loads.
CO2	Apply the knowledge of Finite element Methods in selection of suitable elements based on the type of analysis required.
CO3	Apply the knowledge of Finite element Methods through Ansys software to find optimized structures based on the shape subjected to rotational loads.
CO4	Apply the knowledge of Ansys software to find thermal solutions for plates and pins under thermal loading.
CO5	Plan to develop ansys codes to find stress solution for adhesive joints, welded joints , bolted joints etc.

Course Outcomes for 2017-18 Courses	
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**III**
Course Name	**Engineering Mathematics – III**
Course Code	**15MAT31**
Course Outcome #	**Course Outcome**
CO1	Make use of Fourier series to analyze wave forms of periodic functions
CO2	Make use of Fourier transforms and Z - transforms to analyze wave forms of non periodic functions
CO3	Identify statistical methods to find correlation and regression lines, also numerical methods to solve transcendental equations.
CO4	Utilize Numerical techniques for various finite difference technique problems
CO5	Construct Greens, divergence and Stokes theorems for various engineering applications
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**III**
Course Name	**Analog Electronics Circuits**
Course Code	**15EC32**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Acquire knowledge of • Working principles, characteristics and basic applications of BJT and FET. • Single stage, cascaded and feedback amplifier configurations.
CO2	Analyse the performance of • FET amplifier in CS configuration. • Power Amplifiers and Oscillator circuits.
CO3	Interpretation of performance characteristics of transistors amplifiers, frequency Response and Oscillators
CO4	Apply the knowledge gained in the design of transistorized circuits, amplifiers and Oscillators.
CO5	Make use of transistor to design and analyze Discrete transistor voltage regulators

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**III**
Course Name	**Digital Electronics**
Course Code	**15EC33**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Develop simplified switching equation using Karnaugh Maps and QuineMcClusky techniques.
CO2	Explain the operation of decoders, encoders, multiplexers, demultiplexers, adders, subtractors and comparators.
CO3	Explain the working of Latches and Flip Flops (SR,D,T and JK).
CO4	Design Synchronous/Asynchronous Counters and Shift registers using Flip Flops.
CO5	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits. Apply the knowledge gained in the design of Counters and Registers.
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**III**
Course Name	**Network Analysis**
Course Code	**15EC34**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Ability to apply knowledge of mathematics and engineering on electronic circuits like node analysis, loop analysis
CO2	Analyze small RLC circuits and performing basic electrical measurements to verify circuit concepts.
CO3	Able to apply different theorems to reduce complicated circuits (thevenin, Norton).
CO4	Evaluate the time response of basic circuits with one energy storage element Use network techniques
CO5	Evaluate the steady state time response of R, L and C elements supplied by sinusoidal voltage or current sources

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**III**
Course Name	**Electronic Instrumentation**
Course Code	**15EC35**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Define and describe accuracy and precision, types of errors, statistical and probability analysis.
CO2	Describe basic functional concepts of various analog and digital measuring instruments.
CO3	Describe basic concepts of microprocessor based instruments
CO4	Describe and discuss functioning and types of oscilloscopes and signal generators, AC and DC bridges.
CO5	Recognize and describe significance and working of different types of transducers.
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**III**
Course Name	**Engineering Electromagnetics**
Course Code	**15EC36**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Evaluate problems on electric field due to point, linear, volume charges by applying conventional methods or by Gauss law.
CO2	Determine potential and energy with respect to point charge and capacitance using Laplace equation.
CO3	Calculate magnetic field, force, and potential energy with respect to magnetic materials.
CO4	Apply Maxwell's equation for time varying fields, EM waves in free space and conductors.
CO5	Evaluate power associated with EM waves using Poynting theorem.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**IV**
Course Name	**Engineering Mathematics – IV**
Course Code	**15MAT41**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply Numerical methods to obtain the solution of fist order and first degree differential equations
CO2	Make use of probability theory on discrete and continuous random variables to obtain the solution of problems on different distributions and joint probability distribution
CO3	Identify the problems on sampling distribution and on markov chains in attempting the engineering problems for feasible random events
CO4	Utilize the Bessel's and Legendre functions for the problems arising in engineering fields
CO5	Construct the analytic functions. Calculate residues and poles of complex potentials in flow problems.
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**IV**
Course Name	**Microprocessor**
Course Code	**15EC42**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain the architecture of 8086 and illustrate the basic instructions of 8086 with example programs
CO2	Identify 8086 Instructions and make use of assembler directives to write assembly level programs
CO3	Make use of Stack, Interrupts, macros and procedures and develop some modular programs
CO4	Construct the circuits using basic peripherals and interfacing with 8086 by applying bus configuration timings
CO5	Choose appropriate INT 21 DOS interrupt function calls in programming of ADC/DAC and also identify the architecture of 8087/8088.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**IV**
Course Name	**Control Systems**
Course Code	**15EC43**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Model the Open Loop, Closed Loop electrical and mechanical systems using various statergies.
CO2	Make use of the time response specifications and steady state errors for the first ,second order system feedback system
CO3	Utilize different time domain procedures and determine stability of feedback system
CO4	Utilize different frequency domain procedures and determine stability of feedback system
CO5	Make use of state, state variables in linear continuous and discrete time systems
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**IV**
Course Name	**Signals and Systems**
Course Code	**15EC44**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the mathematical description of continuous and discrete time signals and systems.
CO2	Analyze the signals in time domain using convolution difference/differential equations
CO3	Classify signals into different categories based on their properties
CO4	Analyze Linear Time Invariant (LTI) systems in time and transform domains
CO5	Build basics for understanding of courses such as signal processing, control system and communication.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**IV**
Course Name	**Principles of Communication Systems**
Course Code	**15EC45**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Design simple systems for generating and demodulating AM, DSB, SSB and VSB signals.
CO2	Understand the concepts in Angle modulation for the design of communication systems.
CO3	Design simple systems for generating and demodulating frequency modulated signals
CO4	Learn the concepts of random process and various types of noise
CO5	Evaluate the performance of the communication system in presence of noise.
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**IV**
Course Name	**Linear Integrated Circuits**
Course Code	**15EC46**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the parameters of Op-amp, construct basic circuits and analyze DC Amplifiers
CO2	Construct different AC amplifiers using op-amp.
CO3	Build and experiment with certain Op-amp application circuits.
CO4	Construct and interpret the performance characteristics of Filters and regulators.
CO5	Make use of PLL in VCO, op-amp in DAC, ADC converters and 555 Timer in Multivibrators.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**V**
Course Name	**Management & Enterpreneurship**
Course Code	**15ES51**
Course Outcome #	**Course Outcome**
CO1	Identify different ways for Decision Making, Explain various management functions and planning
CO2	Demonstrate Characteristics of organizing, staffing and controlling process
CO3	Choose the best Entrepreneurship model for establishing new industry
CO4	Identify the Institutional support by various state and central government agencies towards business
CO5	Choose different techniques on Project Planning and Development Strategies
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**V**
Course Name	**Digital Signal Processing**
Course Code	**15EC52**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Study and acquire knowledge on Discrete Fourier transform and its properties.
CO2	Understand and implement Fast Fourier transform (decimation in time and decimation in frequency) algorithms for efficient computation of DFT
CO3	Design analog IIR filters (butterworth and chebyshev filter) for various specifications
CO4	Understand different methods of converting analog filters to digital filters
CO5	Design and analyze FIR filter using window technique and frequency sampling

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**V**
Course Name	**Verilog HDL**
Course Code	**15EC53**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Utilize the concept of Hierarchical Modeling and understand the fundamentals of Verilog HDL in designing Digital circuits.
CO2	Identify different types of data types, system tasks, compiler directives in Verilog and utilize them in modeling Verilog code.
CO3	Plan a digital design using gate level modeling and data flow modeling
CO4	Model a Verilog module using behavioral modeling in Verilog and Make use of VHDL concepts in designing Digital circuits.
CO5	Model test benchesto Verify the functionality of digital design.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**V**
Course Name	**Information Theory and Coding**
Course Code	**15EC54**
Student will able to	
Course Outcome #	**Course Outcome**
CO1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source
CO2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
CO3	Model the continuous and discrete communication channels using input, output and joint probabilities
CO4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes
CO5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**V**
Course Name	**Operating System**
Course Code	**15EC553**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the services provided by an operating system.
CO2	Understand how processes are synchronized and scheduled
CO3	Understand different approaches of memory management and virtual memory management.
CO4	Understand the structure and organization of the file system
CO5	Understand inter process communication and deadlock situations.
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**V**
Course Name	**Object Oriented Programming Using C + +**
Course Code	**15EC562**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Describe basics of OOP concepts used in problem solving
CO2	Problem solving using OOP concepts like class and functions
CO3	Describe overloading, Constructors and Destructors used in problem solving
CO4	Define virtual functions, encapsulation, Polymorphism and Inheritance used in problem solving
CO5	Analyze problems and simulate system models that work with streams and files.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VI**
Course Name	**Digital Communication**
Course Code	**15EC61**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Inspect the various bandpass signals and analyze its characteristics with detail study of lines codes.
CO2	Apply Gram Schmidt procedure and utilize optimum receivers using coherent detection.
CO3	Build the various Digital Modulation and demodulation techniques and to study its various parameters.
CO4	Organise Communication through Band limited channels to model the correlative coding.
CO5	Illustrate the principles of spread spectrum techniques
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VI**
Course Name	**ARM Microcontroller & Embedded Systems**
Course Code	**15EC62**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the architectural features and instruction set of 32 bit microcontroller ARM Cortex M3.
CO2	Program ARM Cortex M3 using the various instructions and C language fordifferent applications.
CO3	Understand the basic hardware components and their selection method based onthe characteristics and attributes of an embedded system
CO4	Develop the hardware software co-design and firmware design approaches.
CO5	Explain the need of real time operating system for embedded system applications.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VI**
Course Name	**Microwave Theory and Antennas**
Course Code	**15TE63**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand the Basic Parameters as applied to Antennas and their importance in designing an Antenna and micro strip lines.
CO2	By making use of the concepts of Antenna arrays students will be able to construct radiation patterns
CO3	Develop loop and horn antennas and also explain the importance of different types of antennas
CO4	Apply the concept of S- Parameters and various Microwave passive components
CO5	Make use of the Principle of operation of Microwave Tubes able to solve for reflection cofficient ,transmission coefficient standing wave ratio,using transmission line equations
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VI**
Course Name	**Computer Communication Networks**
Course Code	**15EC64**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify Data Link Layer protocols and services
CO2	Understand Medium access control
CO3	Compare various connecting devices in network
CO4	Classify various network layer protocols and routing algorithms
CO5	Analyze transport layer protocols

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VI**
Course Name	**Digital Switching Systems**
Course Code	**15EC654**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Apply different network structures and Multiplexing techniques in digital transmission systems.
CO2	choose different switching and distributed techniques in digital systems
CO3	Identify different types of telecommunication traffic and single stage switching systems.
CO4	Illustrate the working of space, time switching and switching system software
CO5	Explain the software, hardware architecture and its maintenance
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VI**
Course Name	**Image Processing**
Course Code	**15TE655**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify image formation and the role human visual system plays in perception of gray and color image data.
CO2	Apply image processing techniques the spatial domains
CO3	Apply image processing techniques the frequency (Fourier) domain and identify various noise models & filtering of noise.
CO4	Analyze the concepts of morphological image processing & image segmentation
CO5	Identify image analysis techniques in the form of image segmentation and to evaluate the Methodologies for segmentation.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VI**
Course Name	**Digital System Design using Verilog**
Course Code	**15EC663**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Utilize the concept of assumptions behind the digital abstraction constraints while designing the Digital circuits and construct combinational and sequential circuits.
CO2	Identify different types of memories and errors; make use of error correcting and detecting algorithms.
CO3	Make use of the implementation of fabrics and select suitable fabric for the digital design.
CO4	Model a Verilog module for input and output devices for an embedded system design.
CO5	Illustrate the design flow, optimization of the design and design test concepts.
Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VII**
Course Name	**Computer Communication Network**
Course Code	**10TE71**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Independently understand the OSI reference model and the TCP/IP reference model
CO2	Familiarity with topology and protocols of a computer networks and assist in networking design and implementation
CO3	Familiarize with wireless networking concepts, network technology and data communication system
CO4	Understanding and building of IP addressing to fulfill network requirements and analyze the features of various application layer protocols
CO5	Apply Routing protocol for various networks and solve computational problems

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VII**
Course Name	**Optical Fiber Communication**
Course Code	**10TE72**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Understand propagation of light in waveguide, recognize and categorize Optical fiber structures and types and Apply sophisticated numerical skills to the solution of optical communication problem
CO2	Acquire knowledge on the channel impairments like losses, dispersion along with various coupling losses and analyze the noise performance of the system
CO3	Study and understand Optical sources, detectors, other components in optical fiber link, their different construction methods
CO4	Analysis of design considerations of fiber optic systems
CO5	Understand the wave division multiplexing (WDM) concepts and ability to analyze the importance of the same and Learn variety of networking aspects, FDDI, SONET/SDH

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VII**
Course Name	**Wireless Communication**
Course Code	**10TE73**
Course Outcome #	**Course Outcome**
CO1	Able to understand the broad overview of the wireless systems in greater depth and how it provides voice and circuit switched services.
CO2	Able to have the basic knowledge about problems and design approaches in wireless communication systems.
CO3	Able to understand effects of fading of multipath channels and provide possible solutions to the problem of signal fading in wireless communication links
CO4	Able to understand the wireless communication systems, standards and flow diagrams for GSM, CDMA, TDMA.
CO5	Analyze the working and application of 1G, 2G and 3G cellular systems and IEEE 802.11 and 802.15 standards.

Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VII**
Course Name	**DSP Algorithms & Architecture**
Course Code	**10TE74**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Describe the specific architecture of DSP processor used in the course and understand the architecture of similar commercially produced DSP processors.
CO2	Discuss the various issues that need to be addressed when implementing DSP algorithms in real hardware with finite resources such as processing speed, memory and bit resolution
CO3	Acquire knowledge about various addressing modes of DSP processor TMS320C54XX and program the processor.
CO4	Write assembler code to implement basic DSP algorithms such as linear filtering with FIR and IIR filters and other more complex DSP algorithms.
CO5	Understand the applications of DSP in image processing, speech processing, communication systems and the problems that might be encountered in a research or commercial DSP environment.

Table 1: Course Outcomes

Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VII**
Course Name	**Image processing**
Course Code	**10EC754**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Gained knowledge about fundamentals of Digital Image processing.
CO2	Understand the concepts of Image sensing & acquisition using various sensors and its applications.
CO3	Acquired skills to apply different mathematical methodologies for Image Transformations.
CO4	Capable of applying various techniques for image enhancement, restoration/degradation, compression and segmentation in different domains for grey images.
CO5	Capable of applying various techniques for image enhancement, restoration/degradation, compression and segmentation in different domains for color Images.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VII**
Course Name	**Embedded System Design**
Course Code	**10TE765**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Students will be able to build Simple Embedded System
CO2	Will have ability to solve design problems while developing an ES.
CO3	Will have the ability to code an O.S Kernel for simple task execution
CO4	Students will gain the ability to analyze code complexities
CO5	Students will have the ability to evaluate code performance and simplify complex codes.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VIII**
Course Name	**Optical Networking**
Course Code	**10TE81**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain the basic optical network and different nonlinear effects in optical network
CO2	Identify the need for various optical components, optical transmitters, detectors, switches, wavelength converters in optical networks.
CO3	Summarize the SONET/SDH, second generation networks and Explain the Network architecture ,OTDM, multiplexing and synchronization.
CO4	Make use of different management techniques and apply the knowledge on node design, wavelength assignment in optical networks.
CO5	Apply the knowledge of different crosstalks, dispersion and the overall design consideration in optical network

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VIII**
Course Name	**GSM**
Course Code	**10TE82**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify present GSM system and frequency bands
CO2	Understand the present interference reducing methods and GSM logical channels
CO3	Compare various GSM messages and speech coding methods
CO4	Classify various Privacy Schemes and also various security Schemes
CO5	Analyze cellular mobility and GSM network management

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VIII**
Course Name	**Network Security**
Course Code	**10EC832**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Classify the network services, attacks and able to explain the encryption techniques to illustrate the security methods.
CO2	Compare various private and public key encryption techniques used in cryptosystems.
CO3	Solve the problems with electronic transaction with web security considerations by utilizing the best methods and also to identify the various intruders and intrusion detection techniques
CO4	Identify various viruses, related threats and countermeasures
CO5	Make use of the firewall design principles and trusted systems for network security.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VIII**
Course Name	**Fuzzy Logic**
Course Code	**10TE836**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Ability to understand basic mathematical elements of fuzzy sets emphasis, the differences and similarities between fuzzy and classical sets theories
CO2	Ability to analyze fuzzy arithmetic and fuzzy relations concepts for fuzzy inference system.
CO3	Capable of representing a simple classical proposition using crisp set characteristic function and likewise representing a fuzzy proposition using fuzzy set membership function
CO4	Gains complete knowledge of fuzzification and defuzzification processes for fuzzy inference
CO5	Able to implement fuzzy inference in intelligent or humanistic practical system.

Table 1: Course Outcomes	
Class	**TELECOMMUNICATION ENGINEERING (2017-2018)**
Semester	**VIII**
Course Name	**Adhoc Wireless Networks**
Course Code	**10TE845**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Organize the unique issues in ad-hoc networks.
CO2	Able to analyze current technology trends for implementation of ad-hoc wireless networks.
CO3	Discover the challenges in designing MAC, routing and transport protocols for ad-hoc wireless networks.
CO4	Inspect the challenges in designing routing and transport protocols for ad-hoc wireless networks.
CO5	Identify the security and quality of service for ad-hoc networks

I-Year Basic Science and Humanities	
Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I**
Course Name	**Engineering maths -I**
Course Code	**17MAT11**
Course Outcome #	**Course Outcome**
CO1	Make use of polar curves to find the angle between the curves and radius of curvature
CO2	Make use of partial derivatives to calculate rates of change of multivariate functions
CO3	Analyze position, velocity, and acceleration in two or three dimensions using the calculus of vector valued functions
CO4	Construct and solve first-order ordinary differential equations, Newton's law of cooling
CO5	Apply matrix techniques for solving systems of linear equations in the different areas of Linear Algebra
Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**II**
Course Name	**Engineering maths -II**
Course Code	**17MAT21**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Make use of Inverse differential operator method to obtain the solution of Ordinary Differential Equations and their applications
CO2	Construct the Partial Differential Equations and obtain the solution by direct integration method
CO3	Solve the Cauchy's, Legendre and non linear differential equations
CO4	Identify the double and triple integral and evaluate them by change of order and variables
CO5	Apply Laplace transforms method to obtain the solution of linear differential equations

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**ENGINEERING PHYSICS**
Course Code	**17PHY12,17PHY22**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Build the knowledge of Modern Physics & Quantum Mechanics; Solve the Engineering problems using the concept of wave particle dualism in modern day applications
CO2	Make use of Free Electron Theory to study the material properties and understand its use in Engineering Applications and studies
CO3	Apply the basic principle and concepts of light to construct lasers and optical fibers, impart the knowledge and develop skills to use modern instruments
CO4	Identify the structure and various planes in a Crystals, study its properties and use for applications
CO5	Build the concept shock waves & Construct a quantum mechanical model to explain the behavior of systems at Nano level and identify its application.

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**ENGINEERING CHEMISTRY**
Course Code	**17CHE12,17CHE22**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Make use of polymers by replacement of conventional materials (metals) for domestic and industrial applications.
CO2	Identify the concepts of corrosion & apply their knowledge for protection of metals from using different method
CO3	Solve energy crisis, knocking in IC engine and emission of toxic pollutants using alternate energy sources (Solar energy, biodiesel and power alcohol).
CO4	Construct working and applications of the electrochemical cells, battery and fuel cells by using the principles of electrochemistry
CO5	Utilize of sewage treatment, desalination of sea water and over viewing of synthesis, properties and applications of nanomaterials

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**PROGRAMMING WITH C AND DATA STRUCTURES**
Course Code	**17PCD13 / 17PCD23**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Explain the basic data types, operators, I/O statements, pseudocode, algorithm and structure of C program and demonstrate simple C programs
CO2	Build the C programs by utilizing the concepts of branching, looping statements
CO3	Construct the C programs by using arrays, strings, functions, Illustrate the terms involved in functions and develop modular programs using functions
CO4	Make use of structure, file concepts, develop and implement C programs.
CO5	Construct the C programs for pointers concept. Outline the basics of data Structures

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**Elements of Civil Engg & Engg Mechanics**
Course Code	**17CIV14/24**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the role of Civil Engineer in the Infrastructure development of the county, to know different types of roads, pavements, dams and bridges
CO2	Apply basics of mechanics, force, system of forces and types of force systems and equilibrium. To analyze frictional problems and to make use of lamis theorem
CO3	Identify and select different types of supports, loads and beams used in practical applications
CO4	Apply use of Centroid and moment of inertia of different geometrical figures and their applications
CO5	Apply Newton's laws of motion, understanding concept of super elevation and projectile and rectilinear motions.

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**BASIC ELECTRONICS**
Course Code	**17ELN15 /17ELN25**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the basic electronic devices such as PN diode , BJT its basic operations and their applications
CO2	Construct the biasing circuit for BJT, ideal operational amplifier and its applications
CO3	Make use of number systems, logic gates, De'Morgans theorem, algebraic simplification and develop few combinational logic circuits
CO4	Construct the fundamental latch, flip flops and to study the microcontroller 8051 and its applications
CO5	Illustrate the basic communication systems, modulation systems and various transducers

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**Basic Electrical Engineering**
Course Code	**17ELE15 /17ELE25**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Identify the behavior of electrical and magnetic circuits.
CO2	Classify the type of generator / motor required for a particular application
CO3	Identifythe requirement of transformers in transmission and distribution of electrical power and other Applications
CO4	Utilize Electrical Safety Rules & standards.
CO5	Make use of the course knowledge to work on multi-disciplinary teams

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**COMPUTER PROGRAMMING LABORATORY**
Course Code	**17CPL16 / 17CPL26**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Illustrate the knowledge on various parts of a computer.
CO2	Develop a flowcharts and write algorithms for every C Programs
CO3	Develop C problem solving skills
CO4	Develop modular programming skills.
CO5	Analyze the tracing and debugging of a program.

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**ENGG PHYSICS LAB**
Course Code	**17 PHYL17/ 27**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Analysis the concepts of quantum mechanics to verify the Stefan's law and understand Fermi energy in metals.
CO2	Examine the chateristics of Zener diode, photo diode, transistor by utilizing the concepts of semiconductors physics.
CO3	Discover the ability to use various passive electrical components, determine Dielectric constant and electrical resonance.
CO4	Analysis the concepts of diffraction and interference of light by using diffraction grating and Newton's ring.
CO5	Inspect the modulus of elasticity for various rigid bodies by setting up torsional pendulum and uniform bending.

Table 1: Course Outcomes	
Class	**FIRST YEAR**
Semester	**I&II**
Course Name	**Engineering Chemistry Lab**
Course Code	**17CHEL17/27**
At the end of this course, the student will be able to:	
Course Outcome #	**Course Outcome**
CO1	Estimate the amount of analytic present in the solution using the principles of electro analytical techniques (pH Meter, Condutometer, Potentiometer, Flame Photometry and Photoelectric Colorimeter)
CO2	Determine the viscosity coefficient of liquid using Ostwald's Viscometer
CO3	Estimate the amount of Cao in cement and Total Hardness of water by complex metric Titration
CO4	Estimate the % of copper in brass by Iodometric Titration
CO5	Estimate the amount of iron in hematite ore and COD in waste water by Redox Titration