K S INSTITUTE OF TECHNOLOGY, BENGALURU

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OUTCOME FOR 2021-22 ACADEMIC YEAR

Course: CALCULUS AND DIFFRENTIAL EQUATIONS
Course Code: 21MAT11
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bending of a curve.
CO 2:Establish the notation of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians.
CO 3:Solve first order linear/nonlinear differential equations analytically using standard methods.
CO 4:Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations.
CO 5: Make use of matrix theory for solving system of linear equations and compute Eigen values and Eigen vectors.

Course: ADVANCED CALCULUS AND NUMERICAL METHODS
Course Code: 21MAT21
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
CO 2:Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations.
CO 3:Construct a variety of partial differential equations and solution by method of separation of variables.
CO 4:Illustrate the applications of multivariate calculus to understand the solenoid and irrational vectors and also exhibit the inner dependence of line, surface and volume integrals.
CO 5:Utilize the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes.

Course: ENGINEERING PHYSICS
Course Code: 21 PHY12/ 22
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Make use of Hooke's law to study the theory of different types of oscillations with their solutions and distinguish between sound waves & its application based on mach number.
CO 2:Apply the Planck's quantum assumptions to study the quantisation of energy and interpretation of particle properties and its wave functions.

CO 3:Apply the concept of interaction of radiation with matter to produce monochromatic light and to study its propagation through optical fibres.
CO 4:Make use of QFET to study the electrical conductivity in solid materials.
CO 5:Choose the various characterisation techniques in studying the structural properties of Nano materials.

Course: Engineering Chemistry
Course Code: 21CHE12/22
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Make use of electrochemical energy systems such as electrodes and batteries.
CO 2:Identify the fundamental concepts of corrosion, its control and surface modification methods namely electroplating and electroless plating
CO 3:Make use of the importance, synthesis and applications of polymers. Understand properties and application of nanomaterials.
CO 4:Apply the knowledge of green chemistry, understand properties and application alternative fuels.
CO 5:Build the knowledge of water chemistry, applications of volumetric and analytical instrumentation.

Course: PROBLEM SOLVING THROUGH PROGRAMMING
Course Code: 21PSP13/23
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Elucidate the components of computer, algorithm and flowchart and the structure of C Programming.
CO 2:Develop programs using C basic constructs and I/O functions.
CO 3:Develop various searching and sorting techniques using arrays and C basic constructs.
CO 4:Develop solutions to the real-world problems using user defined and built-in functions in C.
CO 5:Design and develop solutions to problems using user defined data types and compiler directives.

Course: BASIC ELECTRONICS & COMMUNICATION ENGG
Course Code: 21ELN14/24
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Make use of the concepts of power supplies, amplifiers and oscillators to build and test its working.

CO 2:Interpret the basics of digital logic circuits and the microcontroller to simulate its applications.
CO 3:Use the basics of embedded systems to understand the advancement in the development of modern embedded system
CO 4:Apply the fundamentals of communication engineering and simulate AM & FM.
CO 5:Make use of concepts of wireless communication to realize cellular communication system.

Course: Elements of Mechanical Engineering
Course Code:21EME15/25
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Understand basic concepts of mechanical engineering in the fields of energy and its utilization, materials technology, manufacturing techniques, and transmission systems through demonstrations.
CO 2:Understand the application of energy sources in Power generation and utilization, Engineering materials, manufacturing, and machining techniques leading to the latest
CO 3:Explain the working principle of IC Engines, Refrigeration and Air Conditioning.
CO 4:Describe the application of power transmission, and Robotics through video demonstration.
CO 5:Describe the advanced manufacturing tools and techniques.

Course: Engineering Chemistry Lab
Course Code: 21CHEL16/26
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1: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)
CO 2:Determine the viscosity coefficient of liquid using Ostwald's Viscometer
CO 3:Estimate the amount of Nickel and Total Hardness of water by complex metric Titration
CO 4:Estimate the % of copper in brass by Iodometric Titration
CO 5:Estimate the amount of iron in hematite ore and COD in waste water by Redox Titration & preparation of nano particles by precipitation method.

Course: Computer Programming Laboratory
Course Code: 21CPL17/27
Course Learning Outcomes:
After completing the course, the students will be able to,

CO 1:Elucidate the problem statement and identify the appropriate solutions.
CO 2:Make use of C compiler, IDE for programming, identify and correct the syntax and runtime errors in programming.
CO 3:Develop algorithm, flowchart and write programs to solve the given problem.
CO 4:Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving.
CO 5:Document the inference and observations made from the implementation.

Course: COMMUNICATIVE ENGLISH
Course Code: 21EGH18
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Illustrate the knowledge of Fundamentals of Communicative English and Skills in general.
CO 2:Apply the Concept of Phonetics with perfect intonation and Pronunciation which in turn is helpful for their better communication skills
CO 3:Make use of English Grammar with ease and also illustrate the importance of Language skills by applying them at professional level.
CO 4:Develop good vocabulary skills there by attain proficiency in language which in turn will help them to communicate efficiently
CO 5:Develop the art/technique of transferring information through presentations.

Course: PROFESSIONAL WRITING SKILLS IN ENGLISH
Course Code: 21EGH28
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Identify common errors in spoken and written communication
CO 2:Get familiarized with English vocabulary and language proficiency
CO 3:Improve nature and style of sensible writing and acquire employment and work place communication skill.
CO 4:Improve the Technical Communication skills through Technical reading and writing practices
CO 5:Perform well in campus recruitment, engineering and all other general competitive examinations

Course: Scientific Foundation of Health
Course Code: 21SFH29
Course Learning Outcomes:

After completing the course, the students will be able to,
CO 1:To understand Health and wellness (and its Beliefs)
CO 2:To acquire Good Health & It's balance for positive mindset
CO 3:To inculcate and develop the healthy lifestyle habits for good health.
CO 4:To Create of Healthy and caring relationships to meet the requirements of MNC and LPG world
CO 5:To adopt the innovative & positive methods to avoid risks from harmful habits in their campus & outside the campus.

Course: INNOVATION AND DESIGN THINKING
Course Code: 21IDT29
Course Learning Outcomes:
After completing the course, the students will be able to,
CO 1:Apply various design thinking process and procedures
CO 2:Model design ideas through different techniques
CO 3:Identify the significance of reverse Engineering to Understand products
CO 4:Model design ideas using technical drawings.
CO 5:Choose appropriate design thinking techniques.

Course: Engineering Mathematics – III (18MAT31)	
CO1	Utilize Numerical techniques for various finite difference technique problems
CO2	Make use of Fourier series to analyze wave forms of periodic functions
CO3	Identify statistical methods to find correlation and regression lines, also numerical methods to solve transcendental equations.
CO4	Obtain the Fourier and Z - transforms to analyze wave forms of non periodic functions
CO5	Construct Greens, divergence and Stokes theorems for various engineering applications

Course: Mechanics Of Materials (18ME32)	
CO1	Utilize the concept of mechanics to solve the art of state problems on stress & strain
CO2	Make use of the concept of stress and strain to solve compound stress and cylinder problems.
CO3	Construct Shear Force and Bending Moment model of beam application and solve for its stresses

CO4	Utilization of pure torsion & column equations in structural application
CO5	Select theory of failure & strain energy equation for solving engineering problems

Course: Basic Thermodynamics (18ME33)	
CO1	**Identify** thermodynamic systems, properties, Zeroth law of thermodynamics, temperature scales, work and heat interactions.
CO2	**Determine** heat, work, internal energy, enthalpy for flow & non flow process using First and Second Law of Thermodynamics.
CO3	**Calculate** change in internal energy, change in enthalpy, change in entropy, efficiency and cop for Reversible and irreversible process.
CO4	**Make use of** the behaviour of pure substances and its applications to practical problems. compare the Availability and Irreversibility.
CO5	**Evaluate** the properties of ideal ,real gases and air- water mixture.

Course: Material Science (18ME34)	
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.

Course: COMPUTER AIDED MACHINE DRAWING (18ME36A)	
CO1	Develop the sectional views of the solids and Draw the orthographic views of the machine components by using CAD software.
CO2	Build the 2D views and 3D drawings of simple machine parts/ Threaded fasteners.
CO3	Construct the views of machine elements including keys, Couplings and joints.
CO4	Inspect Limits, Fits, Tolerances and level of surface finish of machine elements.

CO5	Create 2D and 3D models by standard CAD software with manufacturing considerations.

Course: MATERIALS TESTING LAB (18MEL37A)	
CO1	**Understand** & acquire experimentation skills in the field of material testing.
CO2	**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	Evaluate how to improve structure/behaviour of materials for various industrial applications.

Course: Workshop and Machine Shop Practice (18MEL38A)	
CO1	Perform turning, facing, knurling, thread cutting, tapering, eccentric turning and allied operations, Perform keyways / slots, grooves etc using shaper
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.

Subject :ENGG. MATHEMATICS – IV (18MAT41)	
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.

Course: Applied Thermodynamics (18ME42)	
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	**Make use of** the basic formulations for reciprocating compressors and steam nozzles for efficiency and effect of friction. .

Course: Fluid Mechanics (18ME43)	
CO1	Identify the need of the fluid properties used for the analysis of fluid behavior.
CO2	Utilize the knowledge of kinematics and dynamics while addressing problems of fluid flow. Make use of the principles of bernoulli's theorem to derive an expression for discharge of different flow measuring devices
CO3	Derive an expression for loss of head due to friction in pipes and also an equation of hagen poiseille's for laminar flow through pipe and parallel plates.
CO4	Analyze the development of boundary layer due to the flow over a flat plate and further identify the difference between lift and drag forces for both compressible and incompressible fluid flow.
CO5	Solve the industrial related gas turbine and engines problems using the basic concept of compressible flow and CFD.

Course: KINEMATICS OF MACHINERY (18ME44)	
CO1	**Understanding** the basic terminology of planar mechanisms and their motion study.
CO2	**Model** displacement diagrams for followers with various types of motions and Cam profile drawing for various followers.
CO3	**Evaluating** the transmission of power by application of various gears and gear trains.
CO4	**Constructing** velocity and acceleration diagrams for planar mechanisms by Graphical method
CO5	**Inspect** velocity and acceleration of planar mechanisms by complex algebra method and kinematic synthesis of four bar and slider crank kinematic chain

Course: Metal Casting and Welding (18ME45B)	
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.

Course: Mechanical Measurements and Metrology (18ME46B)	
CO1	**Explain** the basic concepts of metrology, standards of measurement and working principles of different comparators.
CO2	**Select** the limits of size, fits, geometric and position tolerances, gauges and their design and calibration process of instruments such as slip gauges, sine bar, sine center and Autocollimator.
CO3	**Interpret** the nomenclature and measuring methods of screw threads and gears.
CO4	**Illustrate** the measurement systems, transducers, intermediate modifying devices and terminating devices.
CO5	**Summarize** the functioning of force, torque, pressure, strain and temperature measuring devices.

Course: Mechanical Measurements and Metrology lab (18ME47B)	
CO1	Explain calibration of pressure gauge, thermocouple, LVDT, load cell and micrometer
CO2	Find angle using Sine Center/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set.
CO3	Obtainmeasurements using Optical Projector/Tool maker microscope, Optical flats.
CO4	Determine cutting tool forces using Lathe/Drill tool dynamometer.
CO5	Find Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth vernier/Gear tooth micrometer.

Course: FOUNDRY AND FORGING LAB (18ME48B)	
CO1	**Analyze** and optimize foundry sand, core sand to a particular application.
CO2	**Build** moulds with or without patterns.
CO3	**Understand** casting of ferrous and non-ferrous objects.
CO4	**Develop** skills in making forging models manually and also with the use of power hammers.

Course: Management and Economics (18ME51)	
CO1	**Explain** the concepts of management and understand the importance of planning, organizing, staffing, directing and controlling in the development of organization.
CO2	**Understand** comprehensive concepts of engineering and economics and identify the alternative uses of limited resources to select the prefered course of action for decision makers.

CO3	**Apply** suitable organizational structure, motivation theories with sound communication tools.
CO4	**Solve** compound interest factors, different economic models such as PWC, FWC, AEC & Rate of return in the process of decision making.
CO5	Calculate the total cost of the products and depreciation of assets using different methods.

Course : DESIGN OF MACHINE ELEMENTS -I (18ME52)	
CO1	Understand the design process, material selection, codes & standards, behaviour of component under impact and cyclic loading
CO2	Determine the stresses induced in a component due to eccentric, torsional impact and reversed bending loads and fatigue loads.
CO3	Determine dimensions of couplings, keys and the corresponding stress developed.
CO4	Design and analyze the riveted joints and welded brackets under transverse and parallel welds.
CO5	Analyze the stresses developed in Joints, threaded fasteners and power screw under static and dynamic loads.

Course: DYNAMICS OF MACHINERY (18ME53)	
CO1	Establish the characteristics of centrifugal governors and gyroscopic effect on ships, aeroplanes & vehicles
CO2	Utilize the concept of balancing in rotating and reciprocating parts of machinery.
CO3	Analyze the effect of static and dynamic equilibrium of forces in planar mechanisms.
CO4	Understand the concept of SHM and determine natural frequencies in un-damped free vibrations of single degree freedom systems
CO5	Inspect the nature of damped free vibrations and Forced vibration of single degree freedom systems.

Course: Turbo machines (18ME54)	
CO1	**Illustrate** the need of dimensional analysis, specific speed, degree of reaction, utilization factor to classify the turbo machines
CO2	**Explain** the working of steam turbine, hydraulic turbine and centrifugal pump based on fluid inlet and exit conditions
CO3	**Make use of** the dimensionless parameter, degree of reaction and fluid inlet and exit directions for **identifying** the type of turbo machine
CO4	**Select** a suitable hydraulic turbine for the analysis based on head, energy input, specific speed and quantity of fluid flowing and **identify** the effect of compounding in steam turbines

CO5	**Identify** the difference between single and multi-stage centrifugal pumps and compressors

Course: Fluid Power Engineering (18ME55)	
CO1	Identify the components of fluid power system (Hydraulic & Pneumatic) with different types of fluids for industrial applications
CO2	Select the types of pumps and actuators for various applications
CO3	Distinguish the types of control valves used in fluid power system with circuit design
CO4	Compare the pneumatic control valves with the hydraulic system
CO5	Examine an appropriate hydraulic or pneumatic circuit or combination circuit like electro-hydraulics, electro-pneumatics for a given application

Course: FLUID MECHANICS AND MACHINES LABORATORY (18MEL57)	
CO1	Estimate the coefficient of friction and head losses in pipes and forces developed by impact of jet on vanes
CO2	Experiment with different types of flow measuring devices.
CO3	Evaluate performance of power generating fluid machines
CO4	Evaluate performance of power absorbing fluid machines
CO5	Evaluate the performance of Reciprocating compressor and air blower

Course: ENERGY LABORATORY (18MEL58)

CO1	**Experiment with** different fuels to measure its properties like flash point, fire point and calorific value
CO2	**Determine** viscosity of different grades of oil at various temperatures using say bolt and redwood viscometer
CO3	Construct actual port timing and valve timing diagram for 4-stroke engine to identify the valve overlap
CO4	**Evaluate** the results of tests on single cylinder four stroke petrol engines and diesel engine and analyze performance curves
CO5	**Determine** the emission values of diesel and petrol engines using gas analyzer inserted into exhaust pipe of engine

Course: Finite Element Method (18ME61)	
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	Establish a relation between mass and stiffness matrix to solve dynamic problems along with axisymmetric ring elements

Course : DESIGN OF MACHINE ELEMENTS -II (18ME62)	
CO1	**Apply** design principles for the design of mechanical systems involving springs, belts, pulleys, and wire ropes.
CO2	**Make use of** beam analysis to design the different gear systems like spur & helical gears
CO3	**Evaluate** the efficiency of the Bevel & worm gears drives for relevant applications:
CO4	**Apply** the Design Principles for the design of Brakes & Clutches.
CO5	**Apply** design concepts of hydrodynamic bearings for different applications and select Anti friction bearings for different applications using the manufacturers, catalogue.

Course : Heat Transfer (18ME63)	
CO1	Illustrate the three modes of heat transfer and interpret conduction heat transfer equations for slab or cylinders or spheres in both steady and unsteady states
CO2	Explain the various correlations for force, free convection, radiation, condensation and heat exchangers.
CO3	Make us of thermal resistance concept to solve numerical on slabs, cylinders, fins in steady state and infinite, semi-infinite solids in unsteady state.
CO4	Examine the type of correlation to be used suitably so as to analyse convection heat transfer for various applications and Boiling and condensation
CO5	Analyse the methods, to find the exit temperature of fluid and size of heat exchangers, also radiation heat transfer rate from black bodies, real surface and thermal shield.

Course: Non-Traditional Machining (18ME641)

CO1	**Explain** the needs, advantages, limitations and applications of non-traditional machining process viz; USM, AJM, WJM, ECM, CHM, EDM, PAM, LBM, and EBM.
CO2	**Compare** the various traditional and non-traditional machining processes and **Classify** and select the various non-traditional machining processes based on nature of energy employed.

CO3	**Explain** the constructional features of USM, AJM, WJM, ECM, CHM, EDM, PAM, LBM, and EBM.
CO4	**Explain** the working principle of USM, AJM, WJM, ECM, CHM, EDM, PAM, LBM, and EBM.
CO5	**Make use of** process characteristics and parameters to **analyze** the performance of USM, AJM, WJM, ECM, CHM, EDM, PAM, LBM, and EBM.

Course: Computer Aided Modeling and Analysis Lab (18MEL66)	
CO1	Understand the basic concepts of representation of engineering problems in to one dimensional modeling and analysis.
CO2	Solve truss problems using one dimensional concept
CO3	Solve bending moment and shear force representation for various loading cases. Solve rectangular plate with a circular hole problem under uni-axial loading.
CO4	Solve thermal problems using one dimensional and two-dimensional FEA concepts
CO5	Solve Dynamic problems through one dimensional FEA concept.

Course: HEAT TRANSFER LABORATORY (18MEL67)	
CO1	Perform experiments to **determine** the thermal conductivity of a metal rod
CO2	**Estimate** the effective thermal resistance in composite slabs and efficiency in pin-fin
CO3	Conduct experiments to **determine** convective heat transfer coefficient for free and forced convection and correlate with theoretical values
CO4	**Determine** surface emissivity of a test plate and Steffan Boltzman Constant
CO5	**Determine** LMDT and Effectiveness in a Parallel Flow and Counter Flow Heat Exchangers**,** Estimate performance of a Vapour Compression Refrigeration.

Course: Control Engineering (18ME71)	
CO1	Explain concepts of loop systems and different types of controllers.
CO2	Construct mathematical models to understand transfer function of mechanical, electrical and hydraulic control systems with block diagrams and SFG.
CO3	Build the concept of transient and steady state system and solve frequency response analysis.
CO4	Solve Bode plots and Root locus plots for frequency response analysis.
CO5	Develop state equation of linear continuous data for controllability and observability.

Course: OPERATION RESEARCH

CO1	Explain the various models and tools used in OR in order to assist the decision making.
CO2	Construct mathematical equations for a real world scenario in LPP form and solve using graphical method
CO3	Solve problems for sequencing the production runs, optimal strategies for players in Game theory and various models of queuing theory.
CO4	Select a suitable method to solve the transportation problem and further validate the same by mathematical software so as to simplify decision making process.
CO5	Apply and solve for; critical path for scheduling project activities; Simplex or Big-M or dual simplex method or Hungarian method for LPP.

Course: Additive Manufacturing (18ME741)	
CO1	Understanding the Additive Manufacturing process, Systems drives and actuators used in it
CO2	Discussing the Polymerization and Powder Metallurgy process and the importance of Nanotechnology
CO3	Summarizing the characterisation techniques used in Powder Metallurgy process
CO4	Explaining the characterisation techniques used on Nanomaterials
CO5	Acquiring Knowledge on CNC and Automation

Course: Computer Integrated Manufacturing Lab (18MEL76)	
CO1	**Explain** the concepts of Computer Integrated manufacturing and Classify NC,CNC and DNC systems.
CO2	**Develop** manual part programs to perform milling, drilling and turning operations in design, simulation and manufacturing.
CO3	**Analyze** the Simulation of Tool Path for different Machining operations of small components using CNC Lathe & CNC Milling Machine.
CO4	**Identify** the concepts of flexible manufacturing systems like Automatic storage and Retrieval system and utilize Robot programming language for simple operations such as pick and place, stacking objects using teach pendent and off line programming.
CO5	**Apply** the knowledge of pneumatics and hydraulics to demonstrate the related experiments.

Course: DESIGN LABORATORY (18MEL77)	
CO1	To determine the natural frequency, logarithmic decrement, damping ratio and damping coefficient in a SDOF systems subjected to longitudinal and torsional vibrations.
CO2	To construct force and couple polygons to balance the rotating masses.

CO3	To utilize the principles of photo elasticity and determine the fringe constant and stress concentration of photo elastic materials subject to different loads.
CO4	To calculate equilibrium speed, sensitiveness, power and effort of Porter and Hartnell Governor.
CO5	To obtain Pressure distribution in Journal bearing and find the critical speed of a rotating shaft.

Course: Energy Engineering (18ME81)	
CO1	**Summarize** the basic concepts of Thermal energy systems, Diesel power plant, Hydel power plant, renewable energy sources and their utilization.
CO2	**Understand** the basic concepts of solar energy, Green energy, zero energy and energy from alternate sources.
CO3	**Apply** the basic concepts for Thermal and Hydel power plant
CO4	**Make use of the** basic concepts solar and wind energy to analyse it
CO5	**Identify** the concepts and applications of Bio mass energy, Green energy and zero energy.

INTERNSHIP/PROFESSIONAL PRACTICE (18ME85)	
CO1	Take part in activities\Process happening in industry to familiarise the industry culture.
CO2	Involve in building the relationship between the industry and institute positively
CO3	Inspect the permitted departments in the industry to examine the advanced technology.
CO4	Analyze the complex engineering problems pertaining in that industry and suggest suitable solutions.
CO5	List the various activities involved in the industry and documents the same as per the university guidelines.

PROJECT WORK(18MEP83)	
CO1	Interact with various industries and identify real world problem statement / identify problems in engineering and technology in selected field of interest.
CO2	Synthesize and apply the mechanical knowledge of engineering to design and implement solutions to open-ended problems
CO3	Design and Develop the concept with mechanical Engineering practices and standards.
CO4	Use different tools for communication, design, implementation, testing and report writing.
CO5	Analyzing professional issues, including ethical, legal, environmental and safety issues, related to project and Develop better interpersonal communication skills, presentation skills, team work and leadership qualities.

Third Semester

Table 3.1.1.1 Course outcomes of – **Engg. Mathematics – III 18MAT31**(Third Semester)

18MAT31.1	Solve first and second order ordinary differential equations arising in engineering problems using single step and multi steps numerical methods
18MAT31.2	Use Laplace transform and inverse Laplace transform in solving differential/integral equation arising in network analysis, control systems and other fields of engineering.
18MAT31.3	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
18MAT31.4	Determine the external functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
18MAT31.5	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems

Table 3.1.1.1 Course outcomes of – **Data Structures And Applications 18CS32**(Third Semester)

18CS32.1	**Apply** the fundamental concepts of data structures and their applications essential for programming/problem solving.
18CS32.2	**Make use of** stacks to evaluate mathematical expressions and queues for mazing problems
18CS32.3	**Choose** linked list to implement of lists, stacks, queues, polynomials and sparse matrix.
18CS32.4	**Construct** various types of trees using linked-lists and apply tree traversal methods for expressions evaluation.
18CS32.5	**Utilize** BFS,DFS, Searching Sorting Hashing and Files concepts to develop various applications

Table 3.1.1.1 Course outcomes of – **Analog and Digital Electronics 18CS33** (Third Semester)

18CS33.1	Design the applications of analog circuits using photo devices, timer IC, power supply and regulator and IC op-amp for various applications such as Schmitt trigger, relaxation oscillator etc.
18CS33.2	Choose the Combinational Logic circuits and simplification techniques such as Karnaugh Maps, Quine McClusky Techniques for designing various digital circuits.
18CS33.3	Construct different circuits using Decoders, Encoders, Multiplexers, Adders and

	Subtractors
18CS33.4	Make use of the latches, Flip-Flops, Registers, Counters for constructing sequential circuits
18CS33.5	Obtain the steps to design counters and registers

Table 3.1.1.1 Course outcomes of – **Computer Organization 18CS34**(Third Semester)

18CS34.1	Construct architecture & organization of a computer system, machine instruction formats and addressing modes.
18CS34.2	Build techniques for I/O communication with standard bus interfaces and interrupt service routines.
18CS34.3	Identify different memories and memory mapping techniques.
18CS34.4	Design different arithmetic operational units.
18CS34.5	Derive control sequences for hardwired and micro-program control units for both single and multi bus processors.

Table 3.1.1.1 Course outcomes of – **Software Engineering 18CS35**(Third Semester)

18CS35.1	Able to **outline** the software engineering principles and illustrate the activities involved in building large software and also illustrating the process of requirements, requirements classification.
18CS35.2	**Demonstrate** Object Orientation Modelling Concepts and Class Modelling
18CS35.3	**Analyze** the system models, examine the object oriented design patterns and list out the open source development tools
18CS35.4	To **choose** appropriate software testing types, also identify the significance of software maintenance.
18CS35.5	To **choose** the right software pricing and measurements of software metrics. Also to identify the software quality parameters and standards

Table 3.1.1.1 Course outcomes of – Discrete mathematical Structures **18CS36** (Third Semester)

18CS36.1	Interpret propositional and predicate logic in knowledge representation and truth verification.
18CS36.2	Demonstrate the properties of integers and fundamental principle of counting in discrete structures.
18CS36.3	Utilize the understandings of relations and functions and be able to determine their properties
18CS36.4	Solve the problems using the concept of graph theory and trees properties
18CS36.5	Solve problems using recurrence relations and Principle of Inclusion and Exclusion

Table 3.1.1.1 Course outcomes of – Analog And Digital Electronics Laboratory**18CSL37**(Third Semester)

18CSL37.1	Utilize Operational Amplifier and timers for different applications also make use of simulation package to design circuits
18CSL37.2	Build window comparator and simulate
18CSL37.3	Choose the Combinational Logic circuits for realizing adders, subtractors and multiplexers and also simulate the same
18CSL37.4	Design MSJK Flip Flop, also make use of simulation package to design circuits
18CSL37.5	Construct code converters circuits, synchronous and asynchronous counters.

Table 3.1.1.1 Course outcomes of – **:DataStructures Laboratory 18CSL38**(Third Semester)

18CSL38.1	**Select** implementation procedures to demonstrate the various operations on different data structures.
18CSL38.2	**Develop** the C programs to implementvarious operations on different data structures.
18CSL38.3	**Identity** suitable data structures to implement stack, queues, trees, graphs and hash table.
18CSL38.4	**Experiment with** C programs to implement stack, queues, trees, graph and hash table with different data structures.

18CSL38.5	**Apply** concepts of arrays, stack, queue, linked list, trees and graph to solve different problems.

Fourth Semester

Table 3.1.1.1 Course outcomes of – **Engg. Mathematics – IV18MAT41** (Fourth Semester)

18MAT41.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
18MAT41.2	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field
18MAT41.3	Fit a suitable curve for the given data and analyze the relationship between two variables using statistical methods.
18MAT41.4	Utilize conformal transformation and complex integral arising in fluid flow visualization and image processing.
18MAT41.5	Apply the knowledge of joint probability distributions in attempting engineering problems for feasible random events and also Understand the concepts of sampling theory and apply it to related real life problems.

Table 3.1.1.1 Course outcomes of – **Design And Analysis Of Algorithms 18CS42**(Fourth Semester)

18CS42.1	**Identify** the Performance Analysis of various Algorithms.
18CS42.2	**Experiment with** time complexity of different algorithms of divide and conquer and decrease and conquer algorithm techniques.
18CS42.3	**Apply** different Greedy and transform and conquer approaches for problem solving.
18CS42.4	**Develop** optimal solutions for different problems using dynamic programming techniques.
18CS42.5	**Model** the different solutions using Backtracking technique, Branch and Bound technique and NP complete and hard technique.

Table 3.1.1.1 Course outcomes of – **Operating Systems 18CS43** (Fourth Semester)

18CS43.1	Identify the need and services of various types of Operating Systems.
18CS43.2	Apply suitable techniques for process scheduling, synchronization and thread management.
18CS43.3	Make use of deadlock and memory management schemes for managing the operating Systems.
18CS43.4	Determining the need of demand paging, file and directory management.
18CS43.5	Apply suitable technique for disk scheduling and protection in operating system.

Table 3.1.1.1 Course outcomes of – **Microprocessors And Microcontrollers 18CS44** (Fourth Semester)

18CS44.1	Apply ARM processor architecture concept to the assembly language programming
18CS44.2	Apply ARM processor programming concept to solve complex problem
18CS44.3	Illustrate the Applicability of the Embedded system
18CS44.4	Illustrate the Design process of Embedded system
18CS44.5	Comprehend the real time operating system used for the Embedded system

Table 3.1.1.1 Course outcomes of – **Object Oriented Concepts 18CS45** (Fourth Semester)

18CS45.1	Learn fundamental features of object oriented language and programming in C++
18CS45.2	Learn Building blocks of Java, how to set up JDK environment and apply the same to create, Debug and run simple java programs
18CS45.3	Learn how to use the concept of inheritance and exception handling in java and apply the same to write simple java programs
18CS45.4	Learn the concepts of Packages, Interfaces and multithreads in Java and apply the same to write simple java programs.
18CS45.5	Learn the concepts of Event Handling and swings in Java and apply the same to write simple Java programs.

Table 3.1.1.1 Course outcomes of – **Data Communication 18CS46**(Fourth Semester)

18CS46.1	**Identify** the different types of network topologies and protocols.
18CS46.2	**Construct** the different line coding schemes, Transmission modes.
18CS46.3	**Apply** different error detection and correction methods for digital data and construct the different switching circuits, link addressing.
18CS46.4	**Distinguish** different data link protocols and select suitable media access control protocol for data transmission.
18CS46.5	**Identify** the architecture of wired and wireless Local Area Networks (LANs).

Table 3.1.1.1 Course outcomes of –**Design And Analysis Of Algorithms Laboratory 18CSL47**(Fourth Semester)

18CSL47.1	**Develop** the JAVA programs to demonstrate the concepts of JAVA programming
18CSL47.2	**Select** theimplementation procedures to demonstrate the various algorithms.
18CSL47.3	**Construct** the JAVA programs to implement various algorithms.
18CSL47.4	**Apply** algorithms to solve different problems.
18CSL47.5	**Build** the JAVA programs for selected programs to solve different algorithms.

Table 3.1.1.1 Course outcomes of – **Microprocessors & Microcontrollers Laboratory 18CSL48**(Fourth Semester)

18CSL48.1	**Demonstrate** different instructions of ARM7/TDMI/LPC2148 using Keil µvision-4 tool/compiler.
18CSL48.2	**Apply** the knowledge of assembly language programming to solve problems using ARM7/TDMI/LPC2148 instruction set.
18CSL48.3	**Illustrate** various ports, configuration registers of 32 bit microcontroller ARM7/TDMI/LPC2148.
18CSL48.4	**Illustrate** various input/output devices to interface with ARM7/TDMI/LPC2148 evaluation board.
18CSL48.5	**Demonstrate** interfacing of various hardware devices using embedded C and evaluation board ARM/TDMI/LPC2148.

Fifth Semester

Table 3.1.1.1 Course outcomes of – **Management & Entrepreneurship For It Industry18CS51** (Fifth Semester)

18CS51.1	**Outline** the functional areas of management, evolution of management theories and classifying planning, organizing and staffing
18CS51.2	**Classify** directing and controlling also interpret the motivational theories and leadership styles
18CS51.3	**Utilize** the entrepreneurial types, roles and its characteristics in the Indian business and also identify business opportunities in terms of market, technical, financial and social feasibility
18CS51.4	**Examine** the need of the project. Dissect the significance and content formulation of project report. Classify Enterprise Resource Planning and Supply Chain Management
18CS51.5	**Classify** the characteristics, steps and policies in establishing micro and small enterprises. Examine the case studies, different intuitional support and importance of IPR

Table 3.1.1.1 Course outcomes of –**Computer Networks 18CS52**(Fifth Semester)

18CS52.1	**Identify** the fundamentals of application layer protocols
18CS52.2	**Utilize** transport layer services and demonstrate UDP and TCP protocols
18CS52.3	**Make use of** Routing algorithms in network layer and classify the routers.
18CS52.4	**Experiment with** elements of Network security
18CS52.5	**Interpret** the concepts of Multimedia Networking & Applications

Table 3.1.1.1 Course outcomes of –Database Management System **18CS53**(Fifth Semester)

18CS53.1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
18CS53.2	Use Structured Query Language (SQL) for database manipulation.
18CS53.3	Design and build simple database systems

18CS53.4	Develop application to interact with databases.
18CS53.5	Use Transaction processing concepts to handle concurrency control

Table 3.1.1.1 Course outcomes of –Automata Theory And Computability **18CS54**(Fifth Semester)

18CS54.1	**Obtain** fundamental understanding of the core concepts in automata theory and theory of computation.
18CS54.2	**Identify** and translate between different formal language representations.
18CS54.3	**Design** Grammars and Automata for different language classes.
18CS54.4	**Develop** skills in formal reasoning and reduction of a problem to a formal model.
18CS54.5	**Consruct** the decidability and intractability of Computational problems. **Experiment with** CFG into Normal forms.

Table 3.1.1.1 Course outcomes of –Application Development Using Python **18CS55**(Fifth Semester)

18CS55.1	**Make use of** Python syntax and semantics to work on flow control statements and functions.
18CS55.2	**Build** Python programs using core data structures like Lists, Dictionaries and Strings.
18CS55.3	**Utilize** the Regular Expression in Python and File system.
18CS55.4	**Make use of** the concepts of Object-Oriented Programming as used in Python.
18CS55.5	**Construct** exemplary applications related to Network Programming, Web Services and Databases in Python.

Table 3.1.1.1 Course outcomes of –Unix Programming **18CS56**(Fifth Semester)

18CS56.1	**Identify** the UNIX features, architecture, structure and organization of UNIX file system.
18CS56.2	**Construct** the regular expression for grep commands and implement shell

	programs.
18CS56.3	**Develop** system programs using different categories of API's.
18CS56.4	**Build**Interprocess communication using various techniques.
18CS56.5	**Utilize** POSIX API for implementing signals.

Table 3.1.1.1 Course outcomes of –Computer Network Laboratory **18CSL57**(Fifth Semester)

18CSL57.1	**Utilize** socket program using TCP & UDP
18CSL57.2	**Develop** security algorithm to provide network security
18CSL57.3	**Make use of** CRC to develop the code for Data link layer protocol
18CSL57.4	**Develop** the performances of Routing protocol
18CSL57.5	**Build** Wired and Wireless network using network simulator

Table 3.1.1.1 Course outcomes of –Database Management System Laboratory **18CSL58**(Fifth Semester)

18CSL58.1	**Construct** tables with different data types and without constraints.
18CSL58.2	**Experiment with**SQL DML/DDL commands querying a table once it is populated.
18CSL58.3	**Implement** database using trigger and stored procedure
18CSL58.4	Develop the queries and views for the given database.
18CSL58.5	**Demonstrate** solution for real world problems using the above learned concepts

Sixth Semester

Table 3.1.1.1 Course outcomes of –System Software And Compiler Design**17CS61**(Sixth Semester)

18CS61.1	Identify the functions of System Software such as Assemblers and loaders
18CS61.2	Make use of the Lexical analysis phase of the compiler to generate tokens
18CS61.3	Utilize different parsers to parse the given input string
18CS61.4	Build Lex and YACC programs
18CS61.5	Construct the syntax directed translation, intermediate code and target code for any given input code

Table 3.1.1.1 Course outcomes of –Computer Graphics And Visualization**18CS62**(Sixth Semester)

18CS62.1	Design and implement algorithms for 2D graphics primitives and attributes.
18CS62.2	Construct Geometric transformations on both 2D and 3D objects.
18CS62.3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.
18CS62.4	Design suitable hardware and software for developing graphics packages using OpenGL.
18CS62.5	Interview the representation of curves, surfaces, Color and Illumination models.

Table 3.1.1.1 Course outcomes of – **Web Technology and its Applications 17CS63**(Sixth Semester)

18CS63.1	Understand HTML and CSS syntax and semantics to build web pages
18CS63.2	Understand the concepts to construct, visually format tables and forms using HTML and CSS
18CS63.3	Develop client side scripts using Javascript and server-side scripts using PHP to generate and display the contents dynamically
18CS63.4	List the principles of object oriented development using PHP
18CS63.5	Illustrate Javascript frameworks like jQuery and Backbone which facilitates developer to focus on core features

Table 3.1.1.1 Course outcomes of –System Software And Lab
18CSL66(Sixth Semester)

18CSL66.1	**Utilize** LEX and YACC to execute programs to recognize valid arithmetic expression, evaluation of expression, to recognize strings
18CSL66.2	**Construct** LL(1) parser for given grammar
18CSL66.3	**Make use of** triples to generate machine code
18CSL66.4	**Develop** programs for CPU Scheduling, deadlock detection, page replacement policies
18CSL66.5	**Choose** LEX and YACC to eliminate comment lines and recognize valid identifiers

Table 3.1.1.1 Course outcomes of –**Computer Graphics Lab With Mini Project 17CSL68**(Sixth Semester)

17CSL68.1	Develop programs using OPENGL Graphics Primitives and attributes
17CSL68.2	Design and implement algorithms for geometric transformations on 2D objects and 3D objects.
17CSL68.3	Make use of line drawing and clipping algorithms using OpenGL functions.
17CSL68.4	Construct programs using double buffers for spinning the objects and viewing API to demonstrate lighting and shading concepts
17CSL68.5	Experiment with various OpenGL APIs to develop applications.
17CSL68.6	Design and Develop graphics with animation and related applications

Table 3.1.1.1 Course outcomes of –**Mobile Application Development 18CSMP68**(Sixth Semester)

17CSL68.1	Configure Android studio to run the applications. Understand and implement Android's User interface functions. Create and run simple Android Programs in the IDE.
17CSL68.2	Understanding **Implicit Intent, Explicit Intents, bundles to navigate from one page to another with data.** Applying the same to create and implement Android programs for demonstrating the same.
17CSL68.3	Understanding **Android Threads.** Applying the same to create and implement Android programs for demonstrating the same.

17CSL68.4	Understanding Communication between native apps, and also from native apps to web browser. Applying the same to create and implement Android programs for demonstrating the same.
17CSL68.5	Integrating the above all learnings for creating a simple app in Android studio for Android phones as a part of mini project.

Seventh Semester

Table 3.1.1.1 Course outcomes of –**Artificial Intelligence and Machine Learning18CS71(**Seventh **Se**mester)

18CS71.1	**Utilize** given AI technique to solve concrete problem
18CS71.2	**Make use of** concept learning to implement finds and candidate elimination algorithm
18CS71.3	**Construct** decision tree and artificial neural network using appropriate algorithms
18CS71.4	**Make use of** Bayes Classifier for solving problems
18CS71.5	**Determine** instance based and reinforcement learning techniques.

Table 3.1.1.1 Course outcomes of –**Big Data and Analytics 18CS72(**Seventh **Se**mester)

18CS72.1	Identify the Bigdata analytics
18CS72.2	Determine Hadoop framework components and Hadoop Distributed filesystem
18CS72.3	Determine the concepts of NoSQL using MongoDB and Cassandra for Big Data
18CS72.4	Make use of MapReduce programming model to process the big data along with Hadoop tools
18CS72.5	Utilize Machine Learning algorithms for real world big data and determine web contents and social networks to provide analytics with relevant visualization tools

Table 3.1.1.1 Course outcomes of –**Big Data and Analytics 18CS73(**Seventh **Se**mester)

Table 3.1.1.1 Course outcomes of –**Artificial Intelligence and Machine Learning Lab 18CS76(**Seventh **Se**mester)

18CS76.1	Make use of AI techniques to solve A * and AO* ALGORITHM
18CS76.2	Construct program to implement concept learning and decision tree problem
18CS76.3	Develop the program to construct artificial neural network using back propagation algorithm
18CS76.4	Utilize Baye's theorem and EM algorithm to classify real world data
18CS76.5	Make use of K-nearest neighbour concept and regression to predict the input data

Eigth Semester

Table 3.1.1.1 Course outcomes of –**Internet of Things Technology18CS81** (Eigth Semester)

18CS81.1	Illustrate the impact and challenges posed by IOT networks leading to new architectural models.
18CS81.2	Identify the development of smart objects and the technologies required to connect them to the network.
18CS81.3	Choose the role of IOT protocols for efficient network communication.
18CS81.4	Identify different sensor technologies for sensing real world entities and identify the applications of IOT in industry.
18CS81.5	Develop the need for Data Analysis and Security in IOT.

K. S. Institute of Technology
DEPARTMENT OF ELECTRONICS AND COMMUNICATION & ENGINEERING
COURSE OUTCOMES 2018-22 BATCH
I SEMESTER

Course code 18MAT11	Course: CALCULUS AND LINEAR ALGEBRA
18MAT11.1	Make use of matrix theory for solving system of linear equations and compute Eigen values and Eigen vectors required for matrix diagonalization process.
18MAT11.2	Establish the notation of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians.
18MAT11.3	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bending of a curve.
18MAT11.4	Solve first order linear/nonlinear differential equations analytically using standard methods.
18MAT11.5	Utilize the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes.

Course code 18CHE12	Course: ENGINEERING CHEMISTRY
18CHE12.1	Make use of Electrochemical energy systems, battery by using the principles of electrochemistry and study its applications.
18CHE12.2	**Identify** the concepts of corrosion & apply their knowledge for protection of metals from using different method.
18CHE12.3	**Solve** energy crisis, knocking in IC engine and emission of toxic pollutants using alternate energy sources (Solar energy, biodiesel and power alcohol).
18CHE12.4	**Utilize** of sewage treatment, desalination of sea water and control of environmental pollution.

18CHE12.5	**Build** the knowledge of instrumental methods of analysis and applications of nano materials.

Course code 18CPS13	Course: C PROGRAMMING FOR PROBLEM SOLVING
18CPS13.1	Illustrate simple algorithms from the different domains such as mathematics and physics.
18CPS13.2	Construct a programming solution to the given problem using C.
18CPS13.3	Construct C programs by using arrays, strings and develop modular programs using basic algorithms.
18CPS13.4	Make use of functions and recursion concepts, develop and implement C programming.
18CPS13.5	Construct the C programs by using structures and pointer concepts.

Course code 18ELN14	Course: BASIC ELECTRONICS
18ELN14.1	Identify and understand the characteristics and operation of Semiconductor Devices
18ELN14.2	Analyze electronic circuits for different applications
18ELN14.3	Design analog circuits using operational amplifiers
18ELN14.4	Design Combinational and Sequential circuits using digital electronic fundamentals
18ELN14.5	Illustrate the principles of communication system

Course code 18ME15	Course: ELEMENTS OF MECHANICAL ENGINEERING
18ME15.1	Demonstrate different types of sources of energy; environmental issues like global warming, Ozone depletion, Basic concepts of thermodynamics and steam.
18ME15.2	Illustrate the Boilers and its accessories; principle of operation of different types Turbines and pumps; types of IC engines, Refrigeration and air conditioning and its working principle.

18ME15.3	Explain the Properties, composition and application of engineering metals; Joining processes, belt drive and gear drives; Machining process like Lathe and milling process; Advanced machining processes like CNC and Robots.
18ME15.4	Calculate the internal energy, entropy and enthalpy of thermodynamic system; thermodynamic properties of steam; the efficiency, power and other related working parameters of IC engines.
18ME15.5	Derive the length of the belt in open and cross belt drive and solve the related problems of Belt drive and gear drives.

Course code 18CHEL16	**Course: ENGINEERING CHEMISTRY LAB**
18CHEL16.1	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)
18CHEL16.2	Determine the viscosity coefficient of liquid using Ostwald's Viscometer
18CHEL16.3	Estimate the amount of Cao in cement and Total Hardness of water by complex metric Titration
18CHEL16.4	Estimate the % of copper in brass by Iodometric Titration
18CHEL16.5	Estimate the amount of iron in hematite ore and COD in waste water by Redox Titration & Estimate the % of chlorine in bleaching powder by Iodometric Titration.

Course code 18CPL17	**Course: C PROGRAMMING LAB**
18CPL17.1	Illustrate the knowledge on various parts of a computer.
18CPL17.2	Develop flow charts and write algorithms for every C programs.
18CPL17.3	Develop C problem solving skills.
18CPL17.4	Develop modular programming skills
18CPL17.5	Analyze the tracing and debugging of a program

Course code 18EGH18	Course: TECHNICAL ENGLISH - I
18EGH18.1	Make use of grammatical english and essentials of language skills and identify nuances of phonetics and intonation and flawless pronunciation.
18EGH18.2	Construct english vocabulary at command and language proficiency.
18EGH18.3	Identify common errors in spoken and written communication.
18EGH18.4	Apply and improve the non verbal communication and kinesics.
18EGH18.5	Build in campus recruitment, engineering and all other general competitive examinations

K. S. Institute of Technology
DEPARTMENT OF ELECTRONICS AND COMMUNICATION & ENGINEERING
COURSE OUTCOMES 2015-19 BATCH
II SEMESTER

Course code 18MAT21	Course: ADVANCED CALCULUS AND NUMERICAL METHODS
18MAT21.1	Apply the knowledge of numerical methods in the modeling of various physical and engineering phenomena
18MAT21.2	Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations.
18MAT21.3	Construct a variety of partial differential equations and solution by method of separation of variables.
18MAT21.4	Illustrate the applications of multivariate calculus to understand the solenoid and irrational vectors and also exhibit the inner dependence of line, surface and volume integrals.
18MAT21.5	Explain the application of infinite series and obtain series solutions of ordinary differential equations

Course code 18PHY22	Course: ENGINEERING PHYSICS
18PHY22.1	Obtain the knowledge of Quantum Mechanics; compute Eigen values, Eigen function, momentum of atomic and subatomic particles. Apprehend theoretical background of laser, construction and working of different types of lasers and its application in different fields.
18PHY22.2	Make use of different theoretical models to study the electrical and thermal properties of materials like conductors, semiconductors and dielectrics to understand its use in engineering applications.
18PHY22.3	Build the concept of shock waves; discover the role of shock waves in various fields. Understand the various types of oscillations and their implications.
18PHY22.4	Identify the elastic properties of materials; impart the knowledge to understand its engineering applications.
18PHY22.5	Establish the interrelation between time varying electric and magnetic field, transverse nature of electromagnetic waves and realize their role in optical fiber communication.

Course code 18ELE23	Course: BASIC ELECTRICAL ENGINEERING

18ELE23.1	Make use of Ohm's Law and Kirchoff's Laws to study the behaviour of electrical circuits with DC sources.
18ELE23.2	Establish relationship between different quantities of electrical circuits powered by single phase and 3 phase AC sources.
18ELE23.3	Identify the operation of single phase transformers and the concepts of electrical wiring.
18ELE23.4	Identify the performance characteristics of 3 phase AC generators and motors
18ELE23.5	Estimate the performance of DC generators and DC motors.

Course code 18CIV24	**Course: ELEMENTS OF CIVIL ENGINEERING & MECHANICS**
18CIV24.1	Outline the Role of Civil Engineer in different fields of civil engineering & Infrastructure development of the country and explain free body diagrams, types of force systems and its theorems.
18CIV24.2	Explain the Newton's law of motion, Kinetics, Kinematics, projectiles, Trusses, Wedge and ladder friction
18CIV24.3	Solve for resultant force in the system and also for friction in bodies viz; Wedge and ladder friction
18CIV24.4	Make use of centroid to analyze geometrical figures and solve for support reactions for various beams
18CIV24.5	Solve for moment of inertia and identify the parameter required for Kinematics, Kinetics & Projectiles

Course code 18EGDL25	**Course: ENGINEERING GRAPHICS**

18EGDL25.1	Explain the standards and conventions followed in preparation of Engineering Drawings
18EGDL25.2	Demonstrate projections of Points, Lines and Plane surfaces on Horizontal and Vertical Planes
18EGDL25.3	Construct the orthographic view of Solids at different positions
18EGDL25.4	Develop the lateral surface of various solids
18EGDL25.5	Build isometric projections which will be helpful in representing the objects in three dimensional appearances

Course code 18PHYL26	**Course: ENGG PHYSICS LAB**
18PHYL26.1	Analysis the concepts of quantum mechanics to verify the Stefan's law and understand Fermi energy in metals.
18PHYL26.2	Examine the chateristics of Zener diode, photo diode, transistor by utilizing the concepts of semiconductors physics.
18PHYL26.3	Discover the ability to use various passive electrical components, determine Dielectric constant and electrical resonance.
18PHYL26.4	Analysis the concepts of diffraction and interference of light by using diffraction grating and Newton's ring.
18PHYL26.5	Inspect the modulus of elasticity for various rigid bodies by setting up torsional pendulum and uniform bending.

Course code 18ELEL27	**Course: BASIC ELECTRICAL ENGINEERING LAB**

18ELEL27.1	**Analyse** the effect of open circuit and short circuit in DC circuits using KCL, KVL.
18ELEL27.2	**Compare** the power factor for different types of lamps
18ELEL27.3	**Measure** the parameters of choke coil and earth resistance
18ELEL27.4	**Measure** current and the power consumed in three phase load.
18ELEL27.5	**Examine** the truth table for two-way and three-way control of lamps.

Course code 18EGH28	**Course: TECHNICAL ENGLISH -II**
18EGH28.1	Identify the common errors in spoken and written communication.
18EGH28.2	Get familiarized with english vocabulary and language proficiency.
18EGH28.3	Improve nature and style of sensible writing and acquire employment and work place communication skills.
18EGH28.4	Improve the technical communication skills through technical reading and writing practices.
18EGH28.5	Perform well in campus recruitment, engineering and all other general competitive examinations.

K. S. Institute of Technology
DEPARTMENT OF ELECTRONICS AND COMMUNICATION & ENGINEERING
COURSE OUTCOMES 2018-22 BATCH
III SEMESTER

Course code 18MAT31	Course: TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES
18MAT31.1	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
18MAT31.2	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
18MAT31.3	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
18MAT31.4	Determine the externals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
18MAT31.5	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.

Course code 18EC32	Course: NETWORK THEORY
18EC32.1	Analyze ac and dc electrical networks.
18EC32.2	Analyse electrical circuits using network theorems.
18EC32.3	Apply transient behaviour and initial conditions to find response of RLC circuits.
18EC32.4	Apply laplace transforms and transient analysis to find response of RLC circuits.
18EC32.5	Apply the various parameters of series ,parallel resonance circuits and two port network parametrs.

Course code 18EC33	Course: ELECTRONIC DEVICES
18EC33.1	Apply the principles of semiconductor physics to electronic devices.
18EC33.2	Identify the characteristics of semiconductor and Optoelectronic devices.
18EC33.3	Analyze the BJTs and FETs circuits using mathematical model.
18EC33.4	Identify the operation of FET and its frequency limitation.
18EC33.5	Identify the fabrication process of semiconductor devices and CMOS process integration.

Course code 18EC34	Course: DIGITAL SYSTEM DESIGN
18EC34.1	Simplify switching equations using K-map and Quine Mc-Cluskey techniques.
18EC34.2	Design combinational logic circuits.
18EC34.3	Design sequential logic circuits
18EC34.4	Analyze sequential logic circuits using Mealy and Moore Finite state machine
18EC34.5	Design complex digital circuits for various applications.

Course code 18EC35	Course: COMPUTER ORGANIZATION AND ARCHITECTURE
18EC35.1	Categorize the operations of major subsystems of computer
18EC35.2	Analyze different types of semiconductor memories and secondary memories.
18EC35.3	Analyze control unit operations.
18EC35.4	Analyze the performance in terms of speed and technolgy.
18EC35.5	Apply the concepts of hardwired control and microprogrammed control.

Course code 18EC36	Course: POWER ELECTRONICS AND INSTRUMENTATION
18EC36.1	Analyse the SCR characteristics, turn-on and turn-off mechanisms.
18EC36.2	Analyse the power electronic converters and controllers.
18EC36.3	Identify the measurement errors and characteristics of the instruments.
18EC36.4	Determine the unknown value of AC Bridges.
18EC36.5	Analyse operations of digital measuring instruments, Transducers and PLCs.

Course code 18ECL37	Course: ELECTRONIC DEVICES AND INSTRUMENTATION LAB
18ECL37.1	Construct and test the rectifiers, clipping circuits, clamping circuits and voltage regulators.
18ECL37.2	Determine the characteristics of SCRs and SCR rectifier circuits.
18ECL37.3	Determine the characteristics of photodiode, LDR and its applications.
18ECL37.4	Determine the characteristics of temperature -resistance bridge circuits.
18ECL37.5	Model the V-I characteristics BJT,MOSFET and the characteristics of UJT triggering and regulated power supply using simulation software.

Course code 18ECL38	Course: DIGITAL SYSTEM DESIGN LAB
18ECL38.1	Design the test the working of combinational circuits.
18ECL38.2	Analyse the working of adders and code converter using multiplexer and decoder.
18ECL38.3	Design the flip flop circuits and verify its working using universal gates.
18ECL38.4	Design synchronous counters and asynchronous counters.
18ECL38.5	Analyze the working of serial adder and multiplier using tool.

K. S. Institute of Technology
DEPARTMENT OF ELECTRONICS AND COMMUNICATION & ENGINEERING
COURSE OUTCOMES 2018-22 BATCH
IV SEMESTER

Course code 18MAT41	Course: COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS
18MAT41.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
18MAT41.2	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
18MAT41.3	Fit a suitable curve for given data and analyze the relationship between two variables using statistical methods.
18MAT41.4	Utilize conformal transformation and complex integral arising in fluid flow visualization and image processing.
18MAT41.5	Apply the knowledge of joint probability distributionsin attempting engineering problems for feasible random events and also Understand the concepts of sampling theory and apply it to related real life problems.

Course code 18EC42	Course: ANALOG CIRCUITS
18EC42.1	Model the BJT and FET amplifiers using small signal and high frequency parameters.
18EC42.2	Analyze the high frequency model of MOSFET and oscillator circuits.
18EC42.3	Analyse the behaviour of BJT power amplifier.
18EC42.4	Examine the operation and application of linear ICs
18EC42.5	Examine the performance of linear ICbased circuits like DAC, ADC, Rectifier and filters.

Course code 18EC43	Course: CONTROL SYSTEMS
18EC43.1	Develop the mathematical model of mechanical / electrical systems and obtain its transfer function using block reduction method /Signal flow graph method
18EC43.2	Ability to relate transient performance parameters (overshoot, rise time, peak time and settling time) for the given system and to evaluate steady state error.
18EC43.3	Identify various stability criteria and Determine the stability of a system in the time domain using Routh-Hurwitz criterion and Root-locus technique.
18EC43.4	Determine the stability of a system in the frequency domain using Nyquist and bode plots

18EC43.5	Develop a control system model in continuous and discrete time using state variable techniques

Course code 18EC44	Course: ENGINEERING STATISTICS and LINEAR ALGEBRA
18EC44.1	Identify Random Variables to extract quantitative statistical parameters and apply the same for special distributions.
18EC44.2	Analyze statistical representations and Eigen values of some special matrices and demonstrate the same using MATLAB.
18EC44.3	Analyze the concept of multiple Random variables to extract quantitative statistical parameters.
18EC44.4	Analyze Random events in typical communication events to extract quantitative statistical parameters.
18EC44.5	Analyze vectors and vector spaces using suitable transformations and basis function sets.

Course code 18EC45	Course: SIGNALS AND SYSTEMS
18EC45.1	Apply the basic operations on signals and classify elementary signals.
18EC45.2	Identify the various systems and analyze the concepts of convolution sum & integral on signals and
18EC45.3	Identify the system properties and represent periodic continuous/discrete signals in time and frequency domain using Fourier series.
18EC45.4	Make use of the properties of Fourier Transform on aperiodic signals to represent the signals in frequency domain.
18EC45.5	Make use of Z-transforms, inverse Z-transforms and transfer functions to analyze the complex LTI systems.

Course code 18EC46	Course: MICROCONTROLLER
18EC46.1	Distinguish the role of functional units in the architecture of 8051 microcontroller
18EC46.2	Identify various instructions of 8051 Microcontroller
18EC46.3	Build solutions using assembly level language and high level language
18EC46.4	Make use of timers/counters, serial port and interrupts to generate delay and perform serial communication
18EC46.5	Design interfacing of peripherals to 8051 Microcontroller

Course code 18ECL47	Course: MICROCONTROLLER LAB
18ECL47.1	Identify the instructions of microcontroller for perform arithmetic operations.
18ECL47.2	Make use of various instructions for generating the delay and convert the code
18ECL47.3	Build solutions using interrupts to operate a switch.
18ECL47.4	MAke use of ADC inetrface to generate the different waveforms.
18ECL47.5	Build solutions to interface LCD and stepper motor to 8051 microcontroller.

Course code 18ECL48	Course: ANALOG CIRCUITS LAB
18ECL48.1	**Design** and test the setup of BJT and FET amplifiers and study its frequency response.
18ECL48.2	**Design** and analyse the applications of opamps for DACs,filetrs ,Schmitt trigger and adder,integrator and differentiator circuits.
18ECL48.3	**Analyze** and test the Multivibrators using 555 Timer.
18ECL48.4	**Analyze** and implement the circuits of Oscillators, Filters, Rectifiers and Multivibrators using BJTs, ICs 741 using simulation software.
18ECL48.5	Analyse and implement the circuits Multivibrators using 555 using simulation software.

K. S. Institute of Technology
DEPARTMENT OF ELECTRONICS AND COMMUNICATION & ENGINEERING
COURSE OUTCOMES 2018-22 BATCH
IV SEMESTER

Course code 18ES51	Course: TECHNOLOGICAL INNOVATION MANAGEMENT AND ENTREPRENEURSHIP
18ES51.1	Understand various management functions, planning and different ways of decision making.
18ES51.2	Understand principles of organizing staffing, directing and controlling.
18ES51.3	Understand social responsibilities of business and basics of entrepreneurship
18ES51.4	Understand family business, idea generation and feasibility analysis.
18ES51.5	Apply the knowledge of Project Formulation and Evaluation Techniques.

Course code 18EC52	Course: DIGITAL SIGNAL PROCESSING
18EC52.1	Construct the frequency domain sampling and reconstruction of discrete time signals.
18EC52.2	Make use of the properties and develop efficient algorithms for the computation of DFT.
18EC52.3	Construct FIR and IIR filters in different structural forms.
18EC52.4	Utilize the procedures to design IIR filters from the analog filters using impulse invariance and bilinear transformation.
18EC52.5	Make use of the characteristics of DSP processors and implement FIR and IIR filters.

Course code 18EC53	Course: PRINCIPLES OF COMMUNICATION SYSTEMS
18EC53.1	Apply the time and frequency domain knowledge for the generation and demodulation of amplitude modulated signals.
18EC53.2	Identify the performance of different generation and detection methodologies of AM, FM and multiplexing.
18EC53.3	Examine analog signals in time domain as random processes and identify the types of basic Noise
18EC53.4	Demonstrate multiplexing and demultiplexing along with reconstruction of digital signals at the transmitter and the receiver respectively.
18EC53.5	Distinguish the characteristics of pulse modulation techniques

Course code 18EC54	Course: INFORMATION THEORY AND CODING
18EC54.1	Apply the concept of dependent and independent source to measure the parameters of information source.
18EC54.2	Construct the code word using source coding algorithms .
18EC54.3	Model the continuous and discrete communication channels using input, output and joint probabilities.
18EC54.4	Inspect the channel coding algorithms for error detection and correction.
18EC54.5	Design the encoding and decoding circuits for different channel coding techniques.

Course code 18EC55	Course: ELECTROMAGNETIC WAVES
18EC55.1	Interpret the problems on electric fields due to point, linear, volume charges by applying conventional methods or by Gauss law.
18EC55.2	Analyze potential and energy with respect to point charge and capacitance using Laplace equation.
18EC55.3	Solve for magnetic field, force, and potential energy of magnetic materials.
18EC55.4	Apply Maxwell‘s equation for time varying fields, EM waves in free space and conductors.
18EC55.5	Make use of Poynting theorem to find power associated with EM waves.

Course code 18EC56	Course: VERILOG HDL
18EC56.1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction & simple programs in VHDL in different styles.
18EC56.2	design and verify the functionality of digital circuit/system using test benches.
18EC56.3	Identify the suitable abstraction level for a particular digital design.
18EC56.4	Write the programs effectively using verilog tasks, functions and directives.
18EC56.5	Perform timing and delay simulation and interpret the various constructs in logic synthesis.

Course code 18ECL57	Course: DIGITAL SIGNAL PROCESSING LAB
18ECL57.1	Apply sampling theorem and effective reconstruction of signal.
18ECL57.2	Compute the DFT for a discrete signal and verification of its properties using MATLAB.
18ECL57.3	Solve difference equations and perform different operations on discrete time signals
18ECL57.4	Design IIR and FIR filters for the given specifications.
18ECL57.5	Implement DSP computations on TMS processor and verify the result

Course code 18ECL58	Course: HDL LAB
18ECL58.1	Develop and write the Verilog programs to simulate combinational circuits in different styles
18ECL58.2	Develop and write the Verilog programs to simulate sequential circuits like flip flops and counters in Behavioral description.
18ECL58.3	Develop, and Synthesize Combinational and Sequential circuits on programmable ICs
18ECL58.4	Develop and Interface the hardware to the FPGA chips through I/O ports.
18ECL58.5	Develop and write test benches for performance analysis of digital designs in Hardware Descriptive Languages

K. S. Institute of Technology
DEPARTMENT OF ELECTRONICS AND COMMUNICATION & ENGINEERING
COURSE OUTCOMES 2018-22 BATCH
VI SEMESTER

Course code 18EC61	Course: DIGITAL COMMUNICATION
18EC61.1	Develop the concepts of Band pass sampling to well specified signals and channels.
18EC61.2	Utilize the performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels.
18EC61.3	Identify valid symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels.
18EC61.4	Identify the bandpass signals when subjected to corruption and distortion during transmission over a bandlimited channel.
18EC61.5	Identify the need for data security using spread spectrum technique and error rate calculation.

Course code 18EC62	Course: EMBEDDED SYSTEMS
18EC62.1	Construct the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.
18EC62.2	Make use of the knowledge gained for Programming ARM Cortex M3 for different applications.
18EC62.3	Identify the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
18EC62.4	Develop the hardware/software co-design and firmware design using ARM Cortex M3.Instruction set.
18EC62.5	Establish the need of real time operating system for embedded system applications

Course code 18EC63	Course: MICROWAVE AND ANTENNA
18EC63.1	Identify the working of reflex Klstron by studying the mode curves and also understand transmission lines structures along with its line equations using smith charts to calculate the reflection coefficient ,SWR,input and load impedance.
18EC63.2	Solve for microwave network parameters using S-matrix and also study passive microwave devices like connectors ,Adapters attenuators ,Tees and phase shifters .
18EC63.3	Identify the different types of strip lines and understandthe antenna basics to find various parameters like antenna gain, directivity.
18EC63.4	Classify the point source of n-isotropic antennas and electric dipole.

18EC63.5	Identify loop,horn antenna and the helical antenna by making use of the design considerations.

Course code 18ECL66	Course: EMBEDDED Controller LAB
18ECL66.1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language.
18ECL66.2	Develop assembly language programs using ARM Cortex M3 for different applications
18ECL66.3	Develop C language programs to interface external devices and I/O with ARM Cortex M3.
18ECL66.4	Develop C language programs for embedded system applications.
18ECL66.5	Develop C language programs which makes use of library functions for embedded system applications.

Course code 18ECL67	Course: COMMUNICATION LAB
18ECL67.1	Make use of the characteristics and response of microwave devices
18ECL67.2	Utilize the characteristics of micros trip antennas and measurement of its parameters.
18ECL67.3	Construct the analog and digital modulation schemes with the display of waveforms and computation of performance parameters
18ECL67.4	Make use of the sampling and multiplexing concepts and reconstruct.
18ECL67.5	Model different digital communication concepts using simulation

Course code 18ECM68	Course: MINI PROJECT
18ECM68.1	Identify the Problem statement and technology used. through Literature review in specific area of interest.
18ECM68.2	Formulate specific Objectives and methodology arrive at the block diagram using hardware required for the project.
18ECM68.3	Develop leadership qualities through effective team work & perform functional verification of the project
18ECM68.4	Develop technical writing , presentation, teamwork and communication skills
18ECM68.5	Design the project as per the specification.

K. S. Institute of Technology
DEPARTMENT OF ELECTRONICS AND COMMUNICATION & ENGINEERING
COURSE OUTCOMES 2018-22 BATCH
VII SEMESTER

Course code 18EC71	Course: COMPUTER NETWORKS
18EC71.1	Examine the layering architecture of computer networks and distinguish between the OSI reference model and TCP/IP protocol suite
18EC71.2	Evaluate the protocols and services of Data link layer, Media access control, wired and wireless LANS architectures
18EC71.3	Analyze the packetizing, routing, forwarding services and associated protocols of Network layer.
18EC71.4	Analyze the protocols and functions associated with the transport layer services.
18EC71.5	Analyze the standard application layer Protocols

Course code 18EC72	Course: DIGITAL IMAGE PROCESSING
18EC72.1	Interpret the concept of MOS transistor theory and its V-I characteristics.
18EC72.2	Make use of the steps involved in CMOS fabrication and utilize layout design rules with respect to technology scaling.
18EC72.3	Utilize the basic concepts of combinational and sequential circuit design considering its delay factor.
18EC72.4	Identify the concepts of dynamic logic circuits and Memory elements with its timing considerations.
18EC72.5	Interpret the principles involved in logic verification and testability issues in VLSI design.

Course code 18EC732	Course: SATELLITE COMMUNICATION
18EC732.1	Apply the mathematical preliminaries in analysing the orbital and satellite performance parameters and characteristics.
18EC732.2	Evaluate various subsystems of satellite and earth station design architectures.
18EC732.3	Identify different Multiple Access Techniques and satellite link design for satellite communication.
18EC732.4	Analyze various parameters, characteristics and application of Communication satellites.

18EC732.5	Categorize different types of satellites, orbits and systems for wide range of applications.

Course code 18EC741	**Course: INTRODUCTION TO IOT**
18EC741.1	Explain the architecture of WSN and IOT.
18EC741.2	Identify the communication protocols which best suits in WSN & IOT.
18EC741.3	Design the software for IOT application.
18EC741.4	Evaluate the design principles for WSN & IOT.
18EC741.5	Design the cloud computing and prototyping.

Course code 18EC744	**Course: CRYPTOGRAPHY**
18EC744.1	Explain the fundamental concepts, principles and theories of cryptography.
18EC744.2	Make use of the concepts of generating pseudo random numbers required for cryptographic applications.
18EC744.3	Utilize the various concepts of number theory in cryptography.
18EC744.4	Evaluate the prominent techniques used for public-key cryptosystems and digital signature schemes.
18EC744.5	Design one way hash functions for data encryption.

Course code 18EC745	**Course: MACHINE LEARNING WITH PYTHON**
18EC745.1	Identify the problems in Machine learning.
18EC745.2	Identify the appropriate method of learning like supervised, unsupervised and reinforcement learning for problem solving.
18EC745.3	Apply theory of probability and statistics in machine learning.
18EC745.4	Apply concept learning, ANN, Bayes classifier and K nearest neighbour
18EC745.5	Build statistical analysis of machine learning techniques.

Course code 18EC753	**Course: INTRODUCTION TO ARTIFICIAL INTELLIGENCE**
18EC753.1	Identify the AI based problems.
18EC753.2	Apply Techniques to solve the AI problems.

18EC753.3	Define learning and explain various learning techniques.
18EC753.4	Define and learn different strategies for game palying, interactions between computer and natural languages.
18EC753.5	Discuss on expert systems.

Course code 18ECL76	**Course: COMPUTER NETWORKS LABORATORY**
18ECL76.1	Develop the operations of network protocols and algorithms using C programming.
18ECL76.2	Utilize the network simulator for learning and practice of networking algorithms.
18ECL76.3	Build the network with different configurations to measure the performance parameters.
18ECL76.4	Develop the data link and routing protocols using C programming.
18ECL76.5	Develop wired and wireless LAN protocol using network simulator.

Course code 18ECL77	**Course: VLSI Laboratory**
18ECL77.1	Model basic digital circuits to simulate using EDA Tool.
18ECL77.2	Experiment with synthesis process of digital circuits using EDA tool.
18ECL77.3	Make use of steps involved in synthesis to obtain gate level netlist and to meet desired constraints.
18ECL77.4	Experiment with the basic amplifiers to design higher level circuits like operational amplifier and Analog / Digital converters to meet desired parameters.
18ECL77.5	Inspect steps involved in RTL-GDSII flow and understand the stages in ASIC design.

Course code 18ECP78	Course: PROJECT WORK PHASE I
1ECP78.1	Carry out Literature survey in their specific area of interest.
18ECP78.2	Identify the Problem statement and technology used.
18ECP78.3	Formulate specific Objectives and methodology.
18ECP78.4	Develop technical writing and presentation skills.
18ECP78.5	Develop leadership qualities through effective team work.

K. S. Institute of Technology
DEPARTMENT OF ELECTRONICS AND COMMUNICATION & ENGINEERING
COURSE OUTCOMES 2018-22 BATCH
VIII SEMESTER

Course code 18EC81	Course: WIRELESS AND CELLULAR COMMUNICATION
18EC81.1	**Make use of** the system architecture and the functional standard specified in LTE 4G.
18EC81.2	**Identify** the role of the layer of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users.
18EC81.3	**Utilize** the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios.
18EC81.4	**Identify** the difference between uplink , down link and the physical layer procedures that provide the services to upper layers.
18EC81.5	**Utilize** the Performance of resource management and packet data processing and transport algorithms.

Course code 18ECP83	Course: PROJECT WORK PHASE II
18ECP83.1	**Build** the block diagram using hardware required for the project.
18ECP83.2	**Develop** the software required for the project.
18ECP83.3	**Test** for functionality of the project
18ECP83.4	**Develop** team work and communication skills
18ECP83.5	**Design** the project as per the specifications

Course code 18ECS84	Course: TECHNICAL SEMINAR
18ECS84.1	**Survey** the new technologies, methods, hardware and software tools associated with Electronics & Communication Engineering
18ECS84.2	**Compare** and explain the solutions for problems associated with engineering, society and environment
18ECS84.3	**Analyze** the study material in depth.
18ECS84.4	**Develop** the ability to document the study.
18ECS84.5	**Develop** communication skills.

Course code 18ECI85	Course: INTERNSHIP
18ECI85.1	**Examine** the knowledge and skills acquired in the classroom to a professional context
18ECI85.2	**Apply** the methods for solving the complex problems
18ECI85.3	**Develop** the organizational skills
18ECI85.4	**Develop** the ability to write the report
18ECI85.5	**Develop** the skills for communication and team working