



SRK INSTITUTE OF TECHNOLOGY
Enikepadu, Vijayawada 521108
Approved by AICTE, Affiliated to JNTUK, Kakinada
(ISO 9001:2015 Certified Institution)

Civil Engineering

YEAR	SEMESTER	SUBJECT	COS
I	I	ENGLISH - I	<ul style="list-style-type: none"> • The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly. • The lesson motivates the public to adopt road safety measures • The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival. • The lesson helps to choose a source of energy suitable for rural India. • The lesson creates an awareness in the reader as to the usefulness of animals for the human society. • The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace
I	I	MATHEMATICS-I (Common to all Branch's for I Year B. Tech)	<ul style="list-style-type: none"> • Solve linear differential equations of first, second and higher order. • Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE. • Calculate total derivative, Jacobian and minima of functions of two variables.
I	I	ENGINEERING CHEMISTRY	<ul style="list-style-type: none"> • The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano-materials and fullerenes and their uses. Similarly liquid

			<p>crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.</p>
		<p>Engineering Mechanics</p>	<ul style="list-style-type: none"> • concepts of force and friction, direction and its application • application of free body diagrams. Solution to problems using graphical methods and law of triangle of forces • concepts of centre of gravity • concepts of moment of inertia and polar moment of inertia including transfer methods and their applications • motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion • concepts of work, energy and particle motion
I	I	<p>COMPUTER PROGRAMMING</p>	<ul style="list-style-type: none"> • Write, compile and debug programs in C language. • Use different data types in a computer program. • Design programs involving decision structures, loops and functions. • Explain the difference between call by value and call by reference • Understand the dynamics of memory by the use of pointers • Use different data structures and create/update basic data files.
I	I	<p>ENVIRONMENTAL STUDIES</p>	<ul style="list-style-type: none"> • The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources • The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web • The biodiversity of India and the threats to biodiversity, and conservation practices to

			<p>protect the biodiversity</p> <ul style="list-style-type: none"> • Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices • Social issues both rural and urban environment and the possible means to combat the challenges • The environmental legislations of India and the first global initiatives towards sustainable development • About environmental assessment and the stages involved in EIA and the environmental audit. • Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum.
I	II	ENGLISH -II	<ul style="list-style-type: none"> • The lesson underscores that the ultimate aim of Education is to enhance wisdom. • The lesson enables the students to promote peaceful co-existence and universal harmony among people and society. • The Achievements of C V Raman are inspiring and exemplary to the readers and all scientists. • The lesson imparts the students to manage different cultural shocks due to globalization. • The lesson highlights insightful commentary on cultural traditions. • The lesson offers several inputs to protect environment for the sustainability of the future generations.
I	II	MATHEMATICS – II (MATHEMATICAL METHODS)	<ul style="list-style-type: none"> • Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators. • Compute interpolating polynomial for the given data. • Solve ordinary differential equations numerically using Euler’s and RK

			<p>method.</p> <ul style="list-style-type: none"> • Find Fourier series and Fourier transforms for certain functions. • Identify/classify and solve the different types of partial differential equations.
I	II	MATHEMATICS-III	<ul style="list-style-type: none"> • Determine rank, Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations. • Solve simultaneous linear equations numerically using various matrix methods. • Determine double integral over a region and triple integral over a volume. • Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.
I	II	ENGINEERING PHYSICS	<ul style="list-style-type: none"> • Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials
I	II	Professional Ethics and Human Values	<ul style="list-style-type: none"> • It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties. • It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively
I	II	Engineering Drawing	<ul style="list-style-type: none"> • To introduce the use and the application of drawing instruments and to make the students construct the polygons, curves and various types of scales. The student will be able to understand the need to enlarge or reduce the size of objects in representing them. • To introduce orthographic projections and

			<p>to project the points and lines parallel to one plane and inclined to other.</p> <ul style="list-style-type: none"> • To make the students draw the projections of the lines inclined to both the planes. • To make the students draw the projections of the plane inclined to both the planes. • To make the students draw the projections of the various types of solids in different positions inclined to one of the planes. • To represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.
II/IV R13	I	Electrical & Electronics Engineering	<ul style="list-style-type: none"> • To learn the basic principles of electrical law's and analysis of networks. • To understand the principle of operation and construction details of DC machines. • To understand the principle of operation and construction details of transformer. • To understand the principle of operation and construction details of alternator and 3-Phase induction motor. • To study the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPS. • To learn the operation of PNP and NPN transistors and various amplifiers.
II	I	Probability & Statistics	<ul style="list-style-type: none"> • Examine, analyze, and compare various Probability distributions for both discrete and continuous random variables. • Describe and compute confidence intervals for the mean of a population. • Describe and compute confidence intervals for the proportion and the variance of a population and test the hypothesis concerning mean, proportion and variance and perform ANOVA test. • Fit a curve to the numerical data.
II	I	STRENGTH OF MATERIALS-I	<ul style="list-style-type: none"> • The student will be able to understand the basic materials behaviour under the influence of different external loading conditions and the support conditions.

			<ul style="list-style-type: none"> • The student will be able to draw the diagrams indicating the variation of the key performance features like bending moment and shear forces. • The student will have knowledge of bending concepts and calculation of section modulus and for determination of stresses developed in the beams due to various loading conditions. • The student will be able to assess stresses across section of the thin and thick cylinders to arrive at optimum sections to withstand the internal pressure.
II	I	BUILDING MATERIALS AND CONSTRUCTION	<ul style="list-style-type: none"> • The student should be able to identify different building materials and their importance in building construction. • The student is expected to differentiate brick masonry, stone masonry construction and use of lime and cement in various constructions. • The student should have learnt the importance of building components and finishings. • The student is expected to know the classification of aggregates, sieve analysis and moisture content
II	I	SURVEYING	<ul style="list-style-type: none"> • To demonstrate the basic surveying skills • To use various surveying instruments. • To perform different methods of surveying • To compute various data required for various methods of surveying. • To integrate the knowledge and produce topographical map.
II	I	FLUID MECHANICS	<p><input type="checkbox"/> Upon successful completion of this course the students will be able to:</p> <ul style="list-style-type: none"> • Understand the various properties of fluids and their influence on fluid motion and analyse a variety of problems in fluid statics and dynamics. • Calculate the forces that act on submerged planes and curves. • Identify and analyse various types of fluid flows.

			<ul style="list-style-type: none"> • Apply the integral forms of the three fundamental laws of fluid mechanics to turbulent and laminar flow through pipes and ducts in order to predict relevant pressures, velocities and forces. • Draw simple hydraulic and energy gradient lines. □ Measure the quantities of fluid flowing in pipes, tanks and channels.
II/IV R13	II	BUILDING PLANNING & DRAWING	<ul style="list-style-type: none"> • Student should be able to plan various buildings as per the building by-laws. • The student should be able to distinguish the relation between the plan, elevation and cross section and identify the form and functions among the buildings. • The student is expected to learn the skills of drawing building elements and plan the buildings as per requirements.
II	II	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	<ul style="list-style-type: none"> • The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product • The Student able to get knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs. • One is also ready to understand the nature of different markets and Price Output determination under various market conditions • Understanding the knowledge of different Business Units. • The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and • Able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.
II	II	STRENGTH OF MATERIALS- II	<ul style="list-style-type: none"> • The student will be able to understand the basic concepts of Principal stresses developed when subjected to stresses along different axes and design the sections.

			<ul style="list-style-type: none"> • The student can assess stresses in different engineering applications like shafts, springs, columns and struts subjected to different loading conditions. • The student will be able to assess forces in different types of trusses used in construction.
II	II	HYDRAULICS AND HYDRAULIC MACHINERY	<ul style="list-style-type: none"> • Solve uniform and non uniform open channel flow problems. • Apply the principals of dimensional analysis and similitude in hydraulic model testing. • Understand the working principles of various hydraulic machineries and pumps.
II	II	CONCRETE TECHNOLOGY	<ul style="list-style-type: none"> • Understand the basic concepts of concrete. • realise the importance of quality of concrete. • Familiarise the basic ingredients of concrete and their role in the production of concrete and its behaviour in the field. • Test the fresh concrete properties and the hardened concrete properties. • Evaluate the ingredients of concrete through lab test results. • Design the concrete mix by BIS method. • Familiarise the basic concepts of special concrete and their production and applications. • Understand the behaviour of concrete in various environments.
II	II	STRUCTURAL ANALYSIS - I	<ul style="list-style-type: none"> • The student will be able to estimate the bending moment and shear forces in beams of different fixity conditions. • The student can analyze the continuous beams using tan important method of slope deflection which impart basic concepts for other methods of analysis to be discussed in next level analysis course. • The student will be able to analyze the loads in Pratt and Warren trusses when loads of different types and spans were passing over the truss. These concepts will be used in to understand the performance

			and to design of bridge structures in next level courses.
III/IV	I	ENGINEERING GEOLOGY	<ul style="list-style-type: none"> • Identify and classify the geological minerals. • Measure the rock strengths of various rocks. • Classify and measure the earthquake prone areas to practice the hazard zonation. • Classify, monitor and measure the Landslides and subsidence. • Prepares, analyses and interpret the Engineering Geologic maps • Analyses the ground conditions through geophysical surveys. • Test the geological material and ground to check the suitability of civil engineering project construction. • Investigate the project site for mega/mini civil engineering projects.Site selection for mega engineering projects like Dams,Tunnels, disposal sites etc
III	I	STRUCTURAL ANALYSIS – II	<ul style="list-style-type: none"> • Differentiate Determinate and Indeterminate Structures • Carryout lateral Load analysis of structures • Analyze Cable and Suspension Bridge structures • Analyze structures using Moment Distribution, Kani’s Method and Matrix methods.
III	I	DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES	<ul style="list-style-type: none"> • Work on different types of design philosophies • Carryout analysis and design of flexural members and detailing • Design structures subjected to shear, bond and torsion • Design different type of compression members and footings
III	I	GEOTECHNICAL ENGINEERING – I	<ul style="list-style-type: none"> • The student must know the definition of the various quantities related to soil mechanics and establish their inter-relationships.

			<ul style="list-style-type: none"> • The student should be able to know the methods of determination of the various index properties of the soils and classify the soils. • The student should be able to know the importance of the different engineering properties of the soil such as compaction, permeability, consolidation and shear strength and determine them in the laboratory. • The student should be able to apply the above concepts in day-to-day civil engineering practice.
III	I	TRANSPORTATION ENGINEERING – I	<ul style="list-style-type: none"> • Plan highway network for a given area. • Determine Highway alignment and design highway geometrics. • Design Intersections and prepare traffic management plans. • Judge suitability of pavement materials and design flexible and rigid pavements. • Construct and maintain highways
III	I	INTELLECTUAL PROPERTY RIGHTS AND PATENTS	<ul style="list-style-type: none"> • Intellectual property law – evolutionary past – intellectual property law basics - types of intellectual property and over use or misuse of intellectual property rights - compliance and liability issues are understood. • Principles of copyright and limitations infringement of copyright – international copyright law-semiconductor chip protection act are understood. • Patent law – rights and limitations – rights under patent law – patent requirements and new developments in patent law- invention • Developers and promoters are understood. • Trade mark – trade mark registration process – post registration procedures and international trade mark law • Trade secrets – maintaining trade secret – physical security and breach of • Contract – applying state law are

			<p>understood.</p> <ul style="list-style-type: none"> • Cyber law – information technology act - cyber crime and e-commerce – data security – confidentiality – privacy - international • Aspects of computer and online crime are understood.
III	II	DESIGN AND DRAWING OF STEEL STRUCTURES	<ul style="list-style-type: none"> • Work with relevant IS codes. • Carryout analysis and design of flexural members and detailing. • Design compression members of different types with connection detailing. • Design Plate Girder and Gantry Girder with connection detailing • Produce the drawings pertaining to different components of steel structures.
III	II	GEOTECHNICAL ENGINEERING – II	<ul style="list-style-type: none"> • The student must be able to understand the various types of shallow foundations and decide on their location based on soil characteristics. • The student must be able to compute the magnitude of foundation settlement and decide on the size of the foundation accordingly. • The student must be able to use the field test data and arrive at the bearing capacity. • The student must be able to apply the principles of bearing capacity of piles and design them accordingly.
III	II	TRANSPORTATION ENGINEERING – II	<ul style="list-style-type: none"> • Design geometrics in a railway track. • Provide good transportation network • Design airport geometrics and airfield pavements. • Plan, construct and maintain Docks and Harbours.
III	II	ENVIRONMENTAL ENGINEERING – I	<ul style="list-style-type: none"> • Plan and design the water and distribution networks and sewerage systems. • Identify the water source and select proper intake structure. • Characterisation of water • Select the appropriate appurtenances in the water supply.

			<ul style="list-style-type: none"> • Selection of suitable treatment flow for raw water treatments.
III	II	WATER RESOURCES ENGINEERING-I	<ul style="list-style-type: none"> • Have a thorough understanding of the theories and principles Governing the hydrologic processes. • Be able to quantify major hydrologic components and apply key concepts to several practical areas of engineering hydrology and related design aspects. • Develop Intensity-Duration-Frequency and Depth-Area Duration curves to design hydraulic structures. • Be able to develop design storms and carry out frequency analysis. • Be able to determine storage capacity and life of reservoirs. • Develop unit hydrograph and synthetic hydrograph. • Be able to estimate flood magnitude and carry out flood routing. • Be able to determine aquifer parameters and yield of wells. • Be able to model hydrologic processes.
III	II	ENVIRONMENTAL POLLUTION AND CONTROL	<ul style="list-style-type: none"> • Identify the air pollutant control devices • Have knowledge on the NAAQ standards and air emission standards • Differentiate the treatment techniques used for sewage and industrial wastewater treatment methods. • Understand the fundamentals of solid waste management, practices adopted in his town/village and its importance in keeping the health of the city. • Appreciate the methods of environmental sanitation and the management of community facilities without spread of epidemics. • Appreciate the importance of sustainable development while planning a project or executing an activity.
IV/IV	I	Geotechnical	<ul style="list-style-type: none"> • The student must be able to understand the

R10		Engineering-II	<p>various types of shallow foundations and decide on their location based on soil characteristics.</p> <ul style="list-style-type: none"> • The student must be able to compute the magnitude of foundation settlement and decide on the size of the foundation accordingly. • The student must be able to use the field test data and arrive at the bearing capacity. • The student must be able to apply the principles of bearing capacity of piles and design them accordingly.
IV	I	Design & Drawing of Irrigation Structures	<ul style="list-style-type: none"> • The student must be able to Surplus weir • The student must be able to Tank sluice with a tower head • The student must be able to Canal drop-Notch type • The student must be able to Canal regulator • The student must be able to Under tunnel • The student must be able to Syphon aqueduct type III
IV	I	Environmental Engineering	<ul style="list-style-type: none"> • Plan and design the sewerage systems • Characterisation of Sewage • Select the appropriate appurtenances in the sewerage systems • Selection of suitable treatment flow for sewage treatment • Identify the critical point of pollution in a river for a specific amount of pollutant disposal into the river
IV	I	Remote Sensing and GIS Applications	<ul style="list-style-type: none"> • Be familiar with ground, air and satellite based sensor platforms. • Interpret the aerial photographs and satellite imageries • Create and input spatial data for GIS application • Apply RS and GIS concepts in water resources engineering
IV	I	Earthquake Resistant	<ul style="list-style-type: none"> • The student should be able explain

		Design	<p>fundamentals of seismology</p> <ul style="list-style-type: none"> • The student should be able acquaint with principles of structural dynamics • The student should be able solve SDOF systems and suggest ductile design • The student should be able compute equivalent lateral seismic loads • The student should be able seismic design as per IS codal provisions
IV	I	Air Pollution and Control	<ul style="list-style-type: none"> • Decide the ambient air quality based on the analysis of air pollutants • Design particulate and gaseous control measures for an industry • Judge the plume behaviour in a prevailing environmental condition • Estimate carbon credits for various day to day activities
IV	II	Estimation, Specifications & Contracts	<ul style="list-style-type: none"> • The student should be able to determine the quantities of different components of buildings. • The student should be in a position to find the cost of various building components. • The student should be capable of finalizing the value of structures.
IV	II	Ground Water Development and Management	<ul style="list-style-type: none"> • At the end of the course the student will be able to Estimate aquifer parameters and yield of wells. • Analyse radial flow towards wells in confined and unconfined aquifers. • Design wells and understand the construction practices. • Interpret geophysical exploration data for scientific source finding of aquifers. • Determine the process of artificial recharge for increasing groundwater potential. • Take effective measures for controlling saline water intrusion. • Apply appropriate measures for

			groundwater management.
IV	II	Water Shed Management	<ul style="list-style-type: none"> • calculate watershed parameters and analyse watershed • Characteristics to take appropriate management action. • Quantify soil erosion and design control measures. • Apply land grading techniques for proper land management. • Suggest suitable harvesting techniques for better watershed management. • Apply appropriate models for watershed management.
IV	II	Advanced Structural Analysis	<ul style="list-style-type: none"> • Apply energy principles for the analysis of determinate/indeterminate structures. • Analyze structures comprising axial elements, Beams, Grids, Plane and space frames using matrix methods. • Analyse continuous beams and grids by flexibility and stiffness matrix methods. • Apply matrix methods for elastic instability and second order effects including plane frames and space frames.

Electrical and Electronics Engineering

YEAR	SEMESTER	SUBJECT	COS
I	I	ENGLISH - I	<ul style="list-style-type: none"> The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly. The lesson motivates the public to adopt road safety measures The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival. The lesson helps to choose a source of energy suitable for rural India. The lesson creates an awareness in the reader as to the usefulness of animals for the human society. The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace
I	I	MATHEMATICS-I (Common to all Branch's for I Year B. Tech)	<ul style="list-style-type: none"> Solve linear differential equations of first, second and higher order. Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE. Calculate total derivative, Jacobian and minima of functions of two variables.
I	I	MATHEMATICS – II (MATHEMATICAL METHODS)	<ul style="list-style-type: none"> Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators. Compute interpolating polynomial for the given data. Solve ordinary differential equations numerically using Euler's and RK method. Find Fourier series and Fourier transforms for certain functions. Identify/classify and solve the different types of partial differential equations.
I	I	APPLIED PHYSICS	<ul style="list-style-type: none"> Outcome: Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials
I	I	Professional Ethics and Human Values	<ul style="list-style-type: none"> It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties.

			<ul style="list-style-type: none"> • It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively
I	I	Engineering Drawing	<ul style="list-style-type: none"> • To introduce the use and the application of drawing instruments and to make the students construct the polygons, curves and various types of scales. The student will be able to understand the need to enlarge or reduce the size of objects in representing them. • To introduce orthographic projections and to project the points and lines parallel to one plane and inclined to other. • To make the students draw the projections of the lines inclined to both the planes. • To make the students draw the projections of the plane inclined to both the planes. • To make the students draw the projections of the various types of solids in different positions inclined to one of the planes. • To represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.
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I	II	MATHEMATICS-III	<ul style="list-style-type: none"> • Course Outcomes: At the end of the Course, Student will be able to: • Determine rank, Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations. • Solve simultaneous linear equations numerically using various matrix methods. • Determine double integral over a region and

			<p>triple integral over a volume.</p> <ul style="list-style-type: none"> • Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.
I	II	ENGINEERING CHEMISTRY	<ul style="list-style-type: none"> □ The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano-materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.
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		Electrical Circuit Analysis - I	<ul style="list-style-type: none"> • Use basic electrical DC concepts and theorems to analyze circuits. • Build and simulate electrical DC circuits and perform measurements with electronic test equipment. • Write technical reports using collected data
I	II	COMPUTER PROGRAMMING	<ul style="list-style-type: none"> • Understand the basic terminology used in computer programming • Write, compile and debug programs in C

			<p>language.</p> <ul style="list-style-type: none"> • Use different data types in a computer program. • Design programs involving decision structures, loops and functions. • Explain the difference between call by value and call by reference • Understand the dynamics of memory by the use of pointers • Use different data structures and create/update basic data files.
II	I	Electrical Circuit Analysis-II	<ul style="list-style-type: none"> • Students are able to solve three- phase circuits under balanced condition. • Students are able to solve three- phase circuits under unbalanced condition. • Students are able find out transient response of electrical networks with different types of excitations. • Students are able to estimate the different types of two port network parameters. • Students are able to represent electrical equivalent network for a given network transfer function. • Students are able to extract different harmonics components from the response of a electrical network.
II	I	Thermal And Hydro Prime Movers	<ul style="list-style-type: none"> • The student shall be able to calculate the performance of different types of internal combustion engines. • To train the student to calculate the performance of steam turbines using velocity diagrams. • To impart the knowledge of gas turbine fundamentals, the governing cycles and the methods to improve the efficiency of gas turbines. • To impart the knowledge of various types of pumps, their constructional features, working and performance. • Further, the student shall be able to calculate the performance of hydraulic turbines. • To train the student in the areas of types of hydro electric power plants, estimation and calculation of different loads by considering various factors.
		Basic Electronics And Devices	<ul style="list-style-type: none"> • Students are able to understand the basic concepts of semiconductor physics, which are useful to understand the operation of

			<p>diodes and transistors.</p> <ul style="list-style-type: none"> • Students are able to explain the operation and characteristics of PN junction diode and special diodes. • Ability to understand operation and design aspects of rectifiers and regulators. • Students are able to understand the characteristics of various transistor configurations. They become familiar with different biasing, stabilization and compensation techniques used in transistor circuits. • Students are able to understand the operation and characteristics of FET, Thyristors, Power IGBTs and Power MOSFETs. • Students are able to understand the merits and demerits of positive and negative feedback and the role of feedback in oscillators and amplifiers.
II	I	Complex Variable And Statistical Methods	<ul style="list-style-type: none"> • apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic (L3) • find the differentiation and integration of complex functions used in engineering problems (L5) • make use of the Cauchy residue theorem to evaluate certain integrals (L3) • apply discrete and continuous probability distributions (L3) • design the components of a classical hypothesis test (L6) • infer the statistical inferential methods based on small and large sampling tests (L4)
II	I	Electromagnetic Fields	<ul style="list-style-type: none"> • Ability to calculate electric field and potentials using gauss's law or solving Laplace's or Poisson's equations. • Learn how to calculate capacitance. Energy stored in dielectrics and get's the concept of

			<p>conduction and convention currents.</p> <ul style="list-style-type: none"> • Ability to find magnetic field intensity due to current. The application of ampere's law and the Maxwell's second and third equations. • Students can calculate the magnetic forces and torque produced by currents in magnetic field. • Will the able to calculate self and mutual inductances and the energy stored in the magnetic field. • Students will gain knowledge on time varying fields and get ability to calculate induced EMF. Concepts of displacement current and poynting vector and associated problems are solved.
II	I	Electrical Machines – I	<ul style="list-style-type: none"> • Able to explain the concepts of electromagnetic energy conversion. • Able to explain the operation of dc generator, armature reaction and commutation. • Able to analyze the characteristics and performance of dc generators. • Able to explain the torque developed and performance of dc motors. • Able to analyze the speed control and testing methods of dc motors. • Able to propose design aspects of a dc machine.
II	II	Environmental Studies	<ul style="list-style-type: none"> • The natural resources and their importance for the sustenance of the life and recognise the need to conserve the natural resources. • The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. • The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. • Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices. • Social issues both rural and urban environment and the possible means to combat the challenges. • The environmental legislations of India and the first global initiatives towards sustainable development. • About environmental assessment and the

			stages involved in EIA and the environmental audit.
		Switching Theory And Logic Design	<ul style="list-style-type: none"> • To study number system and codes in digital logic design. Study of basic logic gates • To study Boolean theorems K-Maps, tabulation method for minimization of Boolean functions • To study different types of combinational logic circuits like adders subtractors Multiplexer's, demultiplexers, encoders and decoders. • To study different types of combinational logic circuits like PLA,PAL and PROM • To study different types of sequential logic circuits like counters shift registers • To study different types of Finite State Machines like mealy and moore machines.
		Pulse & Digital Circuits	<ul style="list-style-type: none"> • Able to design linear wave shaping circuits like high pass and low pass RC circuits for different inputs • Able to design non-linear wave shaping circuits like clippers and clampers with non-linear devices • Able to understand the switching characteristics of non-linear devices • Design of multivibrators for generating non-sinusoidal signals • Design time based circuits to generate the time based signals • Understand the principles of synchronization and design synchronous circuits
		Power Systems-I	<ul style="list-style-type: none"> • Students are able to identify the different components of thermal power plants. • Students are able to identify the different components of nuclear Power plants. • Students are able to distinguish between AC & DC distribution systems and also estimate voltage drops in both types of distribution systems. • Students are able to locate the different components of an air and gas insulated substations. • Students are able to identify single core and multi core cables with different insulating materials. • Students are able to analyse the effect of load factor, demand factor and diversity factor on the cost of generation of electrical power and also able to identify the types of tariff applicable to consumers based on their

			load demand..
		Electrical Machines – II	<ul style="list-style-type: none"> • Able to explain the operation and performance of single phase transformer. • Able to explain the regulation losses and efficiency of single phase transformer. • Able to explain types of three phase transformer connection, tap changing methods and 3-phase to 2-phase transformation. • Able to explain the operation and performance of three phase induction motor. • Able to analyze the torque-speed relation, performance of induction motor and induction generator. • Able to explain design procedure for transformers and three phase induction motors
		Control Systems	<ul style="list-style-type: none"> • Ability to derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs. • Capability to determine time response specifications of second order systems and to determine error constants. • Acquires the skill to analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method. • Capable to analyze the stability of LTI systems using frequency response methods. • Able to design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams. • Ability to represent physical systems as state models and determine the response. Understanding the concepts of controllability and observability.
III/IV R13	I	Managerial Economics And Financial Analysis	<ul style="list-style-type: none"> • The Learner is equipped with the knowledge of estimating the Demand for a product and the relationship between Price and Demand • One should understand the Cost Concepts for decision making and to estimate the least cost combination of inputs • One has to understand the nature of different markets and Price Output determination under various market conditions) • One should equipped with the knowledge of different Business Units • The Learner is able to prepare Financial

			<p>Statements and the usage of various Accounting tools for Analysis</p> <ul style="list-style-type: none"> • The Learner is able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making
II	I	Electrical Measurements	<ul style="list-style-type: none"> • Able to choose right type of instrument for measurement of voltage and current for ac and dc. • Able to choose right type of instrument for measurement of power and energy – able to calibrate energy meter by suitable method • Able to calibrate ammeter and potentiometer. • Able to select suitable bridge for measurement of electrical parameters • Able to use the ballistic galvanometer and flux meter for magnetic measuring instruments • Able to measure frequency and phase difference between signals using CRO. Able to use digital instruments in electrical measurements.
II	I	Power Systems–II	<ul style="list-style-type: none"> • Able to understand parameters of various types of transmission lines for using calculation and behavior during different operating conditions. • Able to understand the insight into specific transmission lines short and medium type which would have application in medium and high voltage power transmission systems. • Student will be able to understand the surge propagation, reflection and refraction in transmission lines. such output will be useful in protecting transmission line insulators and designing level of insulation coordination at various high voltages. • Will be able to utilize it for understanding the surge behaviour of transmission line for protection of connects equipments,viz.power transformer and system connected shunt reactors. • Will be able to understand various phenomenon related to charged line transmitting different level of power. • Will be able to understand physical and geometrical parameters of transmission line for safe and efficient performance during

			operating condition of voltage and power.
II	I	Electrical Machines – III	<ul style="list-style-type: none"> Analyze the performance of single phase induction and ac series motors. Explain the structure of synchronous machines and design the windings. Develop solutions for regulation of both non salient pole and salient pole synchronous generators. Explain the role of synchronous generators operation when connected to an infinite bus or when operating in parallel. Analyze the performance of synchronous motor for development of torque and power factor correction. Explain hunting phenomenon and methods of starting of synchronous motor.
		Power Electronics	<ul style="list-style-type: none"> Explain the characteristics of various power semiconductors derive and analyze the operation of diode bridge rectifier. Design firing circuits for SCR. Analyze the operation of AC voltage controller and half-wave phase controlled rectifiers. Explain the operation of single phase full-wave converters and analyze harmonics in the input current. Explain the operation of three phase full-wave converters and dual converter. Analyze the operation of single phase cyclo converters and high frequency dc-dc converters. Explain the working of inverters and application of PWM techniques for voltage control and harmonic mitigation.
		Linear & Digital Ic Applications	<ul style="list-style-type: none"> After completion of this course student can able to differentiate “Analog Circuits & Digital Circuits”. The course content gives an insight in to the fundamentals so that one can design the “Linear Circuits” with their own innovative skills. Those who are taken this course can specialize in this subject in their Post Graduation. It is a challenging task for the individual to exhibit his logical skills & Analytical ability. They can design their own circuits which may be useful for current industry needs.
		Intellectual	<ul style="list-style-type: none"> Intellectual property law – evolutionary past – intellectual property law basics -

		Property Rights And Patents	<p>types of intellectual property and over use or misuse of intellectual property rights - compliance and liability issues are understood.</p> <ul style="list-style-type: none"> • Principles of copyright and limitations infringement of copyright – international copyright law-semiconductor chip protection act are understood. • Patent law – rights and limitations – rights under patent law – patent requirements and new developments in patent law-invention • Developers and promoters are understood. • Trade mark – trade mark registration process – post registration procedures and international trade mark law • Trade secrets – maintaining trade secret – physical security and breach of • Contract – applying state law are understood. • Cyber law – information technology act - cyber crime and e-commerce – data security – confidentiality – privacy - international • Aspects of computer and online crime are understood.
III/IV R13	II	Switchgear And Protection	<ul style="list-style-type: none"> • To be able to understand the principles of arc interruption for application to high voltage circuit breakers of air, oil, vacuum, SF6 gas type. • Ability to understand the working principle and constructional features of different types of electromagnetic protective relays. • Students acquire in depth knowledge of faults that is observed to occur in high power generator and transformers and protective schemes used for all protections. • Improves the ability to understand various types of protective schemes used for feeders and bus bar protection. • Generates understanding of different types of static relays with a view to application in the system. • To be able to understand the different types of over voltages appearing in the system, including existing protective schemes required for insulation co-ordination.
		Microprocessors	<ul style="list-style-type: none"> • To be able to understand the microprocessor capability in general and explore the

		and Microcontrollers	<p>evaluation of microprocessors.</p> <ul style="list-style-type: none"> • To be able to understand the addressing modes of microprocessors • To be able to understand the micro controller capability • To be able to program mp and mc • To be able to interface mp and mc with other electronic devices • To be able to develop cyber physical systems
		Utilization Of Electrical Energy	<ul style="list-style-type: none"> • Able to identify a suitable motor for electric drives and industrial applications • Able to identify most appropriate heating or welding techniques for suitable applications. • Able to understand various level of illuminosity produced by different illuminating sources. • Able to estimate the illumination levels produced by various sources and recommend the most efficient illuminating sources and should be able to design different lighting systems by taking inputs and constraints in view. • Able to determine the speed/time characteristics of different types of traction motors. • Able to estimate energy consumption levels at various modes of operation.
		Power System Analysis	<ul style="list-style-type: none"> • Able to draw an impedance diagram for a power system network. • Able to form a Y bus matrix for a power system network with or without mutual couplings. • Able to find out the load flow solution of a power system network using different types of load flow methods. • Able to formulate the Zbus for a power system network. • Able to find out the fault currents for all types faults with a view to provide data for the design of protective devices. • Able to find out the sequence components of currents for any unbalanced power system network. • Able to analyze the steady state, transient and dynamic stability concepts of a power system.
		Power	<ul style="list-style-type: none"> • Explain the fundamentals of electric drive and different electric braking methods.

		Semiconductor Drives	<ul style="list-style-type: none"> Analyze the operation of three phase converter controlled dc motors and four quadrant operation of dc motors using dual converters. Explain the converter control of dc motors in various quadrants. Explain the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters. Explain the principles of static rotor resistance control and various slip power recovery schemes. Explain the speed control mechanism of synchronous motors .
		Management Science	<ul style="list-style-type: none"> After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational behavior. Will familiarize with the concepts of functional management project management and strategic management.
IV//IV R10	I	High Voltage Engineering	<ul style="list-style-type: none"> To be acquainted with the performance of high voltages with regard to different configurations of electrode systems. To be able to understand theory of breakdown and withstand phenomena of all types of dielectric materials. To acquaint with the techniques of generation of AC,DC and Impulse voltages. To be able to apply knowledge for measurement of high voltage and high current AC,DC and Impulse. To be in a position to measure dielectric property of material used for HV equipment. To know the techniques of testing various equipment's used in HV engineering.
		Power System Operation And Control	<ul style="list-style-type: none"> Able to compute optimal scheduling of Generators. Able to understand hydrothermal scheduling. Understand the unit commitment problem. Able to understand importance of the frequency. Understand importance of PID controllers in single area and two area systems.

			<ul style="list-style-type: none"> • Will understand reactive power control and line power compensation.
		VLSI Design	<ul style="list-style-type: none"> • Ability to demonstrate the fundamentals of IC technology such as various MOS fabrication technologies. • Ability to calculate electrical properties of MOS circuits such as $I_{ds} - V_{ds}$ relationship, V_t, g_m, g_{ds}, figure of merit, sheet resistance, area capacitance. • Ability to demonstrate semi conductor IC design such as PLA's, PAL, FPGA, CPLD's design. • Ability to demonstrate VHDL synthesis, simulation, design capture tools design verification tools, CMOS testing.
		Optimization Techniques	<ul style="list-style-type: none"> • State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem. • Apply classical optimization techniques to minimize or maximize a multi-variable objective function, without or with constraints, and arrive at an optimal solution. • Formulate a mathematical model and apply linear programming technique by using Simplex method. Also extend the concept of dual Simplex method for optimal solutions. • Solve transportation and assignment problem by using Linear programming Simplex method. • Apply gradient and non-gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal solutions. • Formulate and apply Dynamic programming technique to inventory control, production planning, engineering design problems etc. to reach a final optimal solution from the current optimal solution
		Electrical Distribution Systems	<ul style="list-style-type: none"> • Able to understand the various factors of distribution system. • Able to design the substation and feeders. • Able to determine the voltage drop and power loss • Able to understand the protection and its coordination.

			<ul style="list-style-type: none"> • Able to understand the effect of compensation on p.f improvement. • Able to understand the effect of voltage, current distribution system performance.
		<p style="text-align: center;">Energy Audit, Conservation & Management</p>	<ul style="list-style-type: none"> • Explain energy efficiency, conservation and various technologies. • Design energy efficient lighting systems. • Calculate power factor of systems and propose suitable compensation techniques. • Explain energy conservation in HVAC systems. • Calculate life cycle costing analysis and return on investment on energy efficient technologies.
		<p style="text-align: center;">Non-Conventional Sources Of Energy</p>	<ul style="list-style-type: none"> • Analyze solar radiation data, extraterrestrial radiation, and radiation on earth's surface. • Design solar thermal collections. • Design solar photo voltaic systems. • Develop maximum power point techniques in solar PV and wind. • Explain wind energy conversion systems, Betz coefficient, tip speed ratio. • Explain basic principle and working of hydro, tidal, biomass, fuel cell and geothermal systems.
		<p style="text-align: center;">Optimization Techniques</p>	<ul style="list-style-type: none"> • State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem. • Apply classical optimization techniques to minimize or maximize a multi-variable objective function, without or with constraints, and arrive at an optimal solution. • Formulate a mathematical model and apply linear programming technique by using Simplex method. Also extend the concept of dual Simplex method for optimal solutions. • Solve transportation and assignment problem by using Linear programming Simplex method. • Apply gradient and non-gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal solutions. • Formulate and apply Dynamic programming

			<p>technique to inventory control, production planning, engineering design problems etc. to reach a final optimal solution from the current optimal solution</p>
IV//IV R10	II	Digital Control Systems	<ul style="list-style-type: none"> • The students learn the advantages of discrete time control systems and the “know how” of various associated accessories. • The learner understand z–transformations and their role in the mathematical analysis of different systems(like laplace transforms in analog systems). • The stability criterion for digital systems and methods adopted for testing the same are explained. • Finally, the conventional and state–space methods of design are also introduced.
		Advanced Control Systems	<ul style="list-style-type: none"> • State space representation of control system and formulation of different state models are reviewed. • Able to design of control system using the pole placement technique is given after introducing the concept of controllability and observability. • Able to analyse of nonlinear system using the describing function technique and phase plane analysis. • Able to analyse the stability analysis using lypnov method. • Minimization of functionals using calculus of variation studied. • Able to formulate and solve the LQR problem and riccati equation.
		Special Electrical Machines	<ul style="list-style-type: none"> • Explain theory of operation and control of switched reluctance motor. • Explain the performance and control of stepper motors, and their applications. • Describe the operation and characteristics of permanent magnet dc motor. • Distinguish between brush dc motor and brush less dc motor. • Explain the theory of travelling magnetic field and applications of linear motors. • Understand the significance of electrical motors for traction drives.

		<p>Digital Signal Processing</p>	<ul style="list-style-type: none"> • Able to study different types of signals and properties of systems. • Able to apply of Fourier transform to discrete time systems. • Able to apply the FFT and inverse FFT to discrete sequences. • Able to realize and design digital filters. • Able to understand the multi-rate signal processing. • Able to understand architecture of digital signal processors.
		<p>Flexible Alternating Current Transmission Systems (FACTS)</p>	<ul style="list-style-type: none"> • Determine power flow control in transmission lines by using FACTS controllers. • Explain operation and control of voltage source converter. • Discuss compensation methods to improve stability and reduce power oscillations in the transmission lines. • Explain the method of shunt compensation by using static VAR compensators. • Appreciate the methods of compensations by using series compensators. • Explain the operation of modern power electronic controllers (Unified Power Quality Conditioner and Interline Power Flow Controller).
		<p>Oops Through JAVA</p>	<ul style="list-style-type: none"> • Understand the format and use of objects. • Understand basic input/output methods and their use. • Understand object inheritance and its use. • Understand development of JAVA applets vs. JAVA applications. • Understand the use of various system libraries.
		<p>Shell Programming</p>	<ul style="list-style-type: none"> • Use UNIX shells and commands to create powerful data processing applications. • Build UNIX applications using the shell command interpreter and UNIX commands. • Use UNIX at the command line to manage data, files, and programs. • 4. Use UNIX editors and tools to create and modify data files and documents.

		AI Techniques	<ul style="list-style-type: none">• Know different models of artificial neuron.• Use learning methods of ANN.• Use different paradigms of ANN.• Classify between classical and fuzzy sets.• Use different modules of Fuzzy logic controller.• Apply Neural Networks and fuzzy logic for real-time applications.
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Mechanical Engineering

YEAR	SEMESTER	SUBJECT	COURSE OUTCOMES
I	I	ENGLISH - I	<ul style="list-style-type: none"> • The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly. • The lesson motivates the public to adopt road safety measures • The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival. • The lesson helps to choose a source of energy suitable for rural India. • The lesson creates an awareness in the reader as to the usefulness of animals for the human society. • The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace
I	I	MATHEMATICS -I (Common to all Branch's for I Year B. Tech)	<ul style="list-style-type: none"> • Solve linear differential equations of first, second and higher order. • Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE. • Calculate total derivative, Jacobian and minima of functions of two variables.
I	I	ENGINEERING G CHEMISTRY	<p>□ The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano-materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.</p>
I	I	Engineering Mechanics	<ul style="list-style-type: none"> • concepts of force and friction, direction and its application • application of free body diagrams. Solution to problems using graphical methods and

			<p>law of triangle of forces</p> <ul style="list-style-type: none"> • concepts of centre of gravity • concepts of moment of inertia and polar moment of inertia including transfer methods and their applications • motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion • concepts of work, energy and particle motion
I	I	COMPUTER PROGRAMMING	<ul style="list-style-type: none"> • Write, compile and debug programs in C language. • Use different data types in a computer program. • Design programs involving decision structures, loops and functions. • Explain the difference between call by value and call by reference • Understand the dynamics of memory by the use of pointers <input type="checkbox"/> Use different data structures and create/update basic data files.
I	I	ENVIRONMENTAL STUDIES	<ul style="list-style-type: none"> • The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources • The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web • The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity • Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices • Social issues both rural and urban environment and the possible means to combat the challenges • The environmental legislations of India and the first global initiatives towards sustainable development • . • About environmental assessment and the stages involved in EIA and the environmental audit. • • Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation,

			Rain water Harvesting, Parking Curriculum.
I	II	ENGLISH -II	<ul style="list-style-type: none"> • The lesson underscores that the ultimate aim of Education is to enhance wisdom. • The lesson enables the students to promote peaceful co-existence and universal harmony among people and society. • The Achievements of C V Raman are inspiring and exemplary to the readers and all scientists. • The lesson imparts the students to manage different cultural shocks due to globalization. • The lesson highlights insightful commentary on cultural traditions. • The lesson offers several inputs to protect environment for the sustainability of the future generations.
I	II	MATHEMATICS – II (MATHEMATIC AL METHODS)	<ul style="list-style-type: none"> • Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators. • Compute interpolating polynomial for the given data. • Solve ordinary differential equations numerically using Euler's and RK method. • Find Fourier series and Fourier transforms for certain functions. • Identify/classify and solve the different types of partial differential equations.
I	II	MATHEMATICS -III	<ul style="list-style-type: none"> • Determine rank, Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations. • Solve simultaneous linear equations numerically using various matrix methods. • Determine double integral over a region and triple integral over a volume. • Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.
I	II	ENGINEERING PHYSICS	<ul style="list-style-type: none"> • Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials
I	II	Professional Ethics and	<ul style="list-style-type: none"> • It gives a comprehensive understanding of a variety issues that are encountered by every

		Human Values	<p>professional in discharging professional duties.</p> <ul style="list-style-type: none"> • It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively
I	II	Engineering Drawing	<ul style="list-style-type: none"> • To introduce the use and the application of drawing instruments and to make the students construct the polygons, curves and various types of scales. The student will be able to understand the need to enlarge or reduce the size of objects in representing them. • To introduce orthographic projections and to project the points and lines parallel to one plane and inclined to other. • To make the students draw the projections of the lines inclined to both the planes. • To make the students draw the projections of the plane inclined to both the planes. • To make the students draw the projections of the various types of solids in different positions inclined to one of the planes. • To represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.
II	I	Metallurgy & Materials Science	<ul style="list-style-type: none"> • To know the basic concepts of bonds in metals and alloys. To understand the basic requirements for the formation of solid solutions and other compounds. • To understand the regions of stability of the phases that can occur in an alloy system in order to solve the problems in practical metallurgy. • Able to understand the basic differences between cast irons and steels, their properties and practical applications. • Able to find the affect of various alloying elements on iron-iron carbide system. To

			<p>understand the various heat treatment and strengthening processes used in practical applications.</p> <ul style="list-style-type: none"> • Able to understand the properties and applications of widely used non-ferrous metals and alloys so as to use the suitable material for practical applications. • Able to know the properties and applications of ceramic, composite and other advanced materials so as to use the suitable material for practical applications.
		<p>Mechanics of Solids</p>	<ul style="list-style-type: none"> • It gives the ability to find stress, strain poisons ratio etc and stresses in bars of varying cross sections, composite bars, thermal stress in members, stresses on inclined planes with analytical approach and graphical approach, strain energy under different loadings and also problem solving techniques. • Able to perform to construction of shear force diagrams and bending moment diagrams to the different loads for the different support arrangements and also problem solving techniques • Able to perform the bending and shear stress induced in the beams which are made with different cross sections like rectangular, circular, triangular, I, T angle sections and also problem solving techniques. • Able to finding slope and deflection for different support arrangements by Double integration method, Macaulay's method

			<p>and Moment-Area and also problem solving techniques.</p> <ul style="list-style-type: none"> • Able to know how a cylinder fails, what kind of stresses induced in cylinders subjected to internal, external pressures and also problem solving techniques. • Able to perform shear stresses induced in circular shafts, discussing columns in stability point of view and columns with different end conditions.
		Thermodynamics	<ul style="list-style-type: none"> • Basic concepts of thermodynamic systems and related fundamental definitions. Concept of point function and path function with respect to energy, work. heat • First of law of thermodynamics and apply to different thermodynamic systems. application of steady flow energy equation to different mechanical systems • Second law of thermodynamics apply to heat engines, concepts of carnot cycle. entropy, availability and irreversibility and Maxwell.s relations and thermodynamic functions • Steam formation and its representation on property diagram and calculate the quality of steam with help of standard steam tables • psychometric chart and calculate various psychometric properties of air • air standard cycles calculate the efficiency and performance parameter of the cycles
		Managerial Economics & Financial Analysis	<ul style="list-style-type: none"> • The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product and the

			<p>knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs.</p> <ul style="list-style-type: none"> • One is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units. • The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.
		<p>Basic Electrical and Electronics Engineering</p>	<ul style="list-style-type: none"> • Able to analyse the various electrical networks. • Able to understand the operation of DC generators,3-point starter and conduct the Swinburne’s Test. iii. Able to analyse the performance of transformer. • Able to explain the operation of 3-phase alternator and 3-phase induction motors. • Able to analyse the operation of half wave, full wave rectifiers and OPAMPs. • Able to explain the single stage CE amplifier and concept of feedback amplifier.
		<p>Computer Aided Engineering Drawing Practice</p>	<ul style="list-style-type: none"> • To enhance the student’s knowledge and skills in engineering drawing and to introduce drafting packages and commands for computer aided drawing and modelling.
<p>II</p>	<p>II</p>	<p>Kinematics of Machinery</p>	<ul style="list-style-type: none"> • Able to identify basic kinematic pairs. • Able to Design Steering gear mechanism. • Able to Design Velocity and acceleration

			<p>Diagrams.</p> <ul style="list-style-type: none"> • Able to Design circular cam with straight, concave and convex flanks. • Able to Design and analyze friction wheels and toothed gears. • Able to Selection of gear box-Differential gear for an automobile.
		<p>Thermal Engineering -I</p>	<ul style="list-style-type: none"> • Actual cycles and the effect of various losses occurs in the actual cycles • various engine systems along with their function and necessity • combustion phenomenon and knocking in S.I and C.I engines and the several operating parameters and their effect the smooth engine operation • perform testing on S.I and C.I Engines for the calculations of performance and emission parameters • Different types of compressors and to calculate power and efficiency of reciprocating compressors • Mechanical details and to calculate power and efficiency of rotary compressors
		<p>Production Technology</p>	<ul style="list-style-type: none"> • Design patterns, Gating, runner and riser systems • Select a suitable casting process based on the component • Learn various arc and solid state welding processes and select a suitable process based on the application and requirements • Understand various bulk deformation processes • Understand various sheet metal forming and

			processing of plastics
		Fluid Mechanics & Hydraulic Machines	<ul style="list-style-type: none"> • Comprehend different concepts of fluid and its properties, hydrostatic forces acting on different surfaces. • Understand the topics of basic laws of fluids, flow patterns, viscous flow through ducts and their corresponding problems. • Analyze different concepts related to boundary layer theory, velocity profiles and dimensional analysis • Apply the hydrodynamic forces acting on vanes and their performance evaluation. • Explain the importance, function and performance of hydro-machinery
		Machine drawing	<ul style="list-style-type: none"> • Able to understand product symbols, weld symbols, pipe joints. • Understand orthographic projections of machine elements. • Able to isometric projections of machine elements. • Understand detailed assembly drawings of different machine components parts and applications in Industrial operations.
III/IV R13	I	Dynamics of Machinery	<ul style="list-style-type: none"> • Able to identify stabilization of sea vehicles, aircrafts and automobile vehicles. • Able to identify frictional losses, torque transmission of mechanical systems. • Able to design dynamic force analysis of slider crank mechanism and design of flywheel. • Able to design of governor it's working in different condition. • Able to design balancing of reciprocating

			<p>and rotary masses.</p> <ul style="list-style-type: none"> • Able to the identify frequencies of continuous systems starting from the general equation of displacement.
		<p>Metal Cutting & Machine Tools</p>	<ul style="list-style-type: none"> • Able to apply cutting mechanics to metal machining based on cutting force and power consumption. • Able to Operate lathe, milling machines, drill press, grinding machines, etc. • Able to select cutting tool materials and tool geometries for different metals. • Able to Select appropriate machining processes and conditions for different metals. • Able to Learn machining economics.
		<p>Design of Machine Members -I</p>	<ul style="list-style-type: none"> • Able to Apply the design procedure to engineering problems, and to Calculate different stresses in the machine components subjected to various static loads, failures and suitability of a material for an engineering application. • Able to select the suitable materials and significance of tolerances and fits in critical design applications and also to Calculate dynamic stresses in the machine components subjected to variable loads. • Able to Design riveted, welded, bolted joints subjected to static loads and their failure modes. • Able to Design keys, cotters and knuckle joints subjected to static loads and their failure modes • Able to Design the machine shafts and

			<p>suggest suitable coupling for a given application.</p> <ul style="list-style-type: none"> • Able to Calculate stresses in different types of springs subjected to static loads and dynamic loads.
		<p>Instrumentation & Control Systems</p>	<ul style="list-style-type: none"> • After undergoing the course the student can select appropriate device for the measurement of parameters like temperature, pressure, speed, stress, humidity, flow velocity etc., and justify its use through characteristics and performance.
		<p>Thermal Engineering -II</p>	<ul style="list-style-type: none"> • Understand the concept of Rankine cycle. • Understand working of boilers including water tube, fire tube and high pressure boilers and determine efficiencies. • Analyze the flow of steam through nozzles • Evaluate the performance of condensers and steam turbines • Evaluate the performance of gas turbines • Understand working of jet propulsions and rockets and related problems.
		<p>Metrology</p>	<ul style="list-style-type: none"> • Students will be able to design tolerances and fits for selected product quality. • They can choose appropriate method and instruments for inspection of various gear elements and thread elements. • They can understand the standards of length, angles, they can understand the evaluation of surface finish and measure the parts with various comparators. • The quality of the machine tool with alignment test can also be evaluated by

			them.
		IPR & Patents	<ul style="list-style-type: none"> • IPR Laws and patents pave the way for innovative ideas which are instrumental for inventions to seek Patents. • Student get an insight on Copyrights, Patents and Software patents which are instrumental for further advancements.
		Operations Research	<ul style="list-style-type: none"> • Formulate a real time situation into a mathematical model. • Assign a right job to a right person using job sequencing. • Make right decisions in operations management using game theory, queuing theory and replacement analysis. • Solve non-linear problems using non-linear programming techniques. • Perform optimum problem solving using dynamic programming and simulation techniques.
		Interactive Computer Graphics	<ul style="list-style-type: none"> • Upon successful completion of the course, students will be able to: • Use the principles and commonly used paradigms and techniques of computer graphics. • Write basic graphics application programs including animation. • Design programs to display graphic images to given specifications. • Possess in-depth knowledge of display systems, image synthesis, shape modeling, and interactive control of 3D computer graphics applications.
		Design of Machine	<ul style="list-style-type: none"> • The student will able to select the suitable

		Members–II	<p>bearing based on the application of the loads and predict the life of the bearing.</p> <ul style="list-style-type: none"> • Able to design the IC Engines parts. • Able to design the curved beams, calculation of stresses in curved beams and expression for radius of neutral axis for curved beams with different cross-sections. • Able to design power transmission elements such as gears, belts, chains, pulleys, ropes, levers and power screws. • Able to design the spur & helical gear for different engineering applications. • Able to design the Levers and brackets: design of levers and Wire Ropes: Construction, Designation, Stresses in wire ropes.
		Robotics	<ul style="list-style-type: none"> • Identify various robot configuration and components. • Select appropriate actuators and sensors for a robot based on specific application. • Carry out kinematic and dynamic analysis for simple serial kinematic chains. • Perform trajectory planning for a manipulator by avoiding obstacles.
		Heat Transfer	<ul style="list-style-type: none"> • Understand basic modes of heat transfer and compute temperature distribution in steady state and unsteady state heat conduction • Analyze heat transfer through extended surfaces • Interpret and analyze free & forced convection heat transfer • Comprehend the phenomena and flow regimes of boiling and condensation

			<ul style="list-style-type: none"> • Understand the principles of radiation heat transfer • Apply LMTD and NTU methods to design heat exchangers.
		Industrial Engineering and Management	<ul style="list-style-type: none"> • Able to understand fundamental knowledge and skill sets required in the Industrial Management and Engineering profession, which include the ability to apply basic knowledge of mathematics, probability and statistics, and the domain knowledge of Industrial management and Engineering. • To extract graduates with the ability to adopt a system approach to design, develop, implement and innovate integrated systems that include people, materials, information, equipment and energy. • Able to understand the interactions between engineering, business, technological and environmental spheres in the modern society. • To understand their role as engineers and their impact to society at the national global context.
		Refrigeration & Air-conditioning	<ul style="list-style-type: none"> • After undergoing the course the student should be in a position to analyze various refrigerating cycles and evaluate their performance. The student also should be able to perform cooling load calculations and select the appropriate process and equipment for the required comfort and industrial air-conditioning
IV/IV R10	I	Refrigeration & Air-conditioning	<ul style="list-style-type: none"> • After undergoing the course the student should be in a position to analyze various refrigerating cycles and

			<p>evaluate their performance. The student also should be able to perform cooling load calculations and select the appropriate process and equipment for the required comfort and industrial air-conditioning</p>
		CAD/CAM	<ul style="list-style-type: none"> • Describe the mathematical basis in the technique of representation of geometric entities including points, lines, and parametric curves, surfaces and solid, and the technique of transformation of geometric entities using transformation matrix. • Describe the use of GT and CAPP for the product development. • Identify the various elements and their activities in the Computer Integrated Manufacturing Systems.
		Alternative Sources of Energy	<ul style="list-style-type: none"> • The students completing the course will be able to understand the ever increasing quality of life. This phenomenon imposes high demand on conventional fossil fuels. Hence search for alternate fuels is a continuous phenomenon. The student will have an overview of various alternate fuels along with their merits and limitations.
		Unconventional Machining Processes	<ul style="list-style-type: none"> • Able to identify the classification of unconventional machining process • Able to gain knowledge on electro chemical machining process • Able To gain knowledge on thermal metal removal process like ED,EDG & wire EDM • Able to gain knowledge on thermal metal removal process like EBM & LDM • Able to gain knowledge on Plasma machining & other application of plasma in industries • Able to gain knowledge on AJM,WJM & AWJM etc..
		Automobile Engineering	<ul style="list-style-type: none"> • To understand the basic components of automobile, engine lubrication, cooling & engine service • To understand different types of transmission systems in an automobile. • To understand different types of steering systems, & geometry

			<ul style="list-style-type: none"> • To understand the suspension system & their types, Braking systems & their types • To understand the Electrical systems used in automobiles • To understand the Engine specifications, safety systems, engine emission & control & engine servicing
		Open Elective MEMS	<ul style="list-style-type: none"> • Able to study basics of Micro Electro Mechanical Systems (MEMS). • Able to study about various sensors and actuators used in MEMS. • Able to study about the principle and various devices of MOEMS, Fluidic, bio and chemical systems.
IV	II	Interactive Computer Graphics	<ul style="list-style-type: none"> • Upon successful completion of the course, students will be able to: • Use the principles and commonly used paradigms and techniques of computer graphics. • Write basic graphics application programs including animation. • Design programs to display graphic images to given specifications. • Possess in-depth knowledge of display systems, image synthesis, shape modeling, and interactive control of 3D computer graphics applications.
		DEPARTMENTAL ELECTIVE- II Automation in Manufacturing	<ul style="list-style-type: none"> • upon successful completion of this course student should be able to : • Solve the line balancing problems in the various flow line systems with and without use buffer storage. Understand the different automated material handling, storage and retrieval systems and automated inspection systems. Use of Adaptive Control principles and implement the same online inspection and control.
		PowerPlant Engineering	<ul style="list-style-type: none"> • Able to study resources & development of power in India. Steam power plant layout, working of different circuits, combustion properties of coal-overfeed & underfeed fuel beds CO: To understand the working principles of diesel & Gas power plant layouts. • Able to understand the working principles of hydro electric power plant & different hydro-electric plant

			<p>layouts+.</p> <ul style="list-style-type: none"> • Able to understand the working principles of nuclear power plant & types of reactors • Able to understand the concepts of combined operations of different power plants, power plant instrumentation & control, importance of instrumentation & measurement • Able to understand the concepts of power plant economics & environmental considerations
		<p>Production Planning and Control</p>	<ul style="list-style-type: none"> • Understanding of the concepts of production and service systems • Application of principles and techniques in the design, planning and control of these systems to optimise/make best use of resources in achieving. • Finding different strategies employed in manufacturing and service industries • Calculate effectiveness, identify likely areas for improvement, development • implementation and improved planning and control methods for different production systems.

Electronics and Communication Engineering

YEAR	SEMESTER	SUBJECT	COS
I	I	ENGLISH - I	<ul style="list-style-type: none"> • The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly. • The lesson motivates the public to adopt road safety measures • The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival. • The lesson helps to choose a source of energy suitable for rural India. • The lesson creates an awareness in the reader as to the usefulness of animals for the human society. • The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace
I	I	ENGLISH - I	<ul style="list-style-type: none"> • The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly. • The lesson motivates the public to adopt road safety measures • The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival. • The lesson helps to choose a source of energy suitable for rural India. • The lesson creates an awareness in the reader as to the usefulness of animals for the human society. • The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace
I	I	MATHEMATICS-I (Common to all Branch's for I Year B. Tech)	<ul style="list-style-type: none"> • Solve linear differential equations of first, second and higher order. • Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE. • Calculate total derivative, Jacobian and

			minima of functions of two variables.
I	I	MATHEMATICS – II (MATHEMATICAL METHODS)	<ul style="list-style-type: none"> • Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators. • Compute interpolating polynomial for the given data. • Solve ordinary differential equations numerically using Euler’s and RK method. • Find Fourier series and Fourier transforms for certain functions. • Identify/classify and solve the different types of partial differential equations.
I	I	APPLIED PHYSICS	<ul style="list-style-type: none"> • Outcome: Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials
I	I	Professional Ethics and Human Values	<ul style="list-style-type: none"> • It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties. • It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively
I	I	Engineering Drawing	<ul style="list-style-type: none"> • To introduce the use and the application of drawing instruments and to make the students construct the polygons, curves and various types of scales. The student will be able to understand the need to enlarge or reduce the size of objects in representing them. • To introduce orthographic projections and to project the points and lines parallel to one plane and inclined to other. • To make the students draw the projections of the lines inclined to both the planes. • To make the students draw the projections of the plane inclined to both the planes. • To make the students draw the

			<p>projections of the various types of solids in different positions inclined to one of the planes.</p> <ul style="list-style-type: none"> • To represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.
I	II	ENGLISH -II	<ul style="list-style-type: none"> • The lesson underscores that the ultimate aim of Education is to enhance wisdom. • The lesson enables the students to promote peaceful co-existence and universal harmony among people and society. • The Achievements of C V Raman are inspiring and exemplary to the readers and all scientists. • The lesson imparts the students to manage different cultural shocks due to globalization. • The lesson highlights insightful commentary on cultural traditions. • The lesson offers several inputs to protect environment for the sustainability of the future generations.
I	II	MATHEMATICS-III	<ul style="list-style-type: none"> • Course Outcomes: At the end of the Course, Student will be able to: • Determine rank, Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations. • Solve simultaneous linear equations numerically using various matrix methods. • Determine double integral over a region and triple integral over a volume. • Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.
I	II	ENGINEERING CHEMISTRY	<ul style="list-style-type: none"> □ The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are

			<p>discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano-materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.</p>
		<p>Engineering Mechanics</p>	<ul style="list-style-type: none"> • concepts of force and friction, direction and its application • application of free body diagrams. Solution to problems using graphical methods and law of triangle of forces • concepts of centre of gravity • concepts of moment of inertia and polar moment of inertia including transfer methods and their applications • motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion • concepts of work, energy and particle motion
		<p>Network Analysis</p>	<ul style="list-style-type: none"> • apply the knowledge of basic circuit law and simplify the network using reduction techniques • Analyze the circuit using Kirchhoff's law and Network simplification theorems • Infer and evaluate transient response, Steady state response, network functions • Obtain the maximum power transfer to the load , and Analyze the series resonant and parallel resonant circuit • evaluate two-port network parameters , design attenuators and equalizers • Synthesize one port network using Foster and Cauer Forms .
<p>I</p>	<p>II</p>	<p>COMPUTER PROGRAMMING</p>	<ul style="list-style-type: none"> • Understand the basic terminology used in computer programming • Write, compile and debug programs in C language.

			<ul style="list-style-type: none"> • Use different data types in a computer program. • Design programs involving decision structures, loops and functions. • Explain the difference between call by value and call by reference • Understand the dynamics of memory by the use of pointers • Use different data structures and create/update basic data files.
II/IV B.Tech ECE (R13)	I	Managerial Economics and Financial Analysis	<ul style="list-style-type: none"> • The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product and the knowledge of understanding of • The Input-Output-Cost relationships and estimation of the least cost combination of inputs are understood. • One is also ready to understand the nature of different markets • Price Output determination under various market conditions and also to have the knowledge of different Business Units are analyzed. • The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis • To evaluate various investment project proposals with the help of capital budgeting techniques for decision making.
		Electronic Devices and Circuits	<ul style="list-style-type: none"> • Understand the basic concepts of semiconductor physics. • Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation. • Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons. • Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations.

			<ul style="list-style-type: none"> • Know the need of transistor biasing, various biasing techniques for BJT and FET and stabilization concepts with necessary expressions. • 6. Perform the analysis of small signal low frequency transistor amplifier circuits using BJT and FET in different configurations.
		Data Structures	<ul style="list-style-type: none"> • Understand the types of data structures • Understanding Linear data structures using arrays and their applications • Understanding Linear data structures using Linked Lists and their applications • Understanding on-Linear data structures; TREES • Understanding Non-Linear data structures; GRAPHS • Understanding different types of SORTING techniques.
		Environmental Studies	<ul style="list-style-type: none"> • Able to identify and recognize environmental concerns and highlight the solutions to the issues. • Able to learn the use and importance of natural resources for the sustenance of life and recognize the need to conserve the natural resources and solution to problems. • Able to learn the BIO-DIVERSITY of India and threats and conservation practices to protect it. • Able to identify the various attributes of pollution and their impact measures to reduce or control the pollution waste management practices. • Able to understand the social issues both rural and urban environment and the possible means to combat the challenges. • Able to learn about environmental

			assessment and the stages involved in EIA and the planning and the process of environmental audit and importance to eco tourism.
		Signals & Systems	<ul style="list-style-type: none"> • Ability to calculate the Fourier series of continuous time signals and frequency response. • Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform. • Ability to know the types of systems and response of systems. • Ability to know the correlation between the signals and power density spectrum. • Learn how to calculate the Laplace transform of continuous time signals and their properties. • Gain knowledge about Z transforms and learns how to calculate Z transforms.
		Electrical And Mechanical Technology	<ul style="list-style-type: none"> • Able to understand the principles of electrical mechanical conversion • Able to explain the operation of DC generators and analyze the characteristics of DC generators • Able to explain the principles of operations of DC motor and analyze their characteristics • Acquire the skills to analyze the starting and speed control methods of DC motors • Capability to develop equivalent circuit and evaluate performance of transformer • Ability to analyze speed –torque characteristics of induction motor and understand starting methods of induction machine

			<ul style="list-style-type: none"> • Capability to understand the operation of various special machines
	II	Electronic Circuit Analysis	<ul style="list-style-type: none"> • Various electrical networks in presence of active and passive elements • Any R, L, C network with sinusoidal excitation • Any R, L, C network with variation of any one of the parameters i.e R, L, C and f. • Any magnetic circuit with various dot conventions. • Electrical networks with network topology concepts. • Electrical networks by using principles of network theorems.
		Control Systems	<ul style="list-style-type: none"> • Understand the concept of control systems and able to represent Mechanical and electrical systems using Differential Equations. • Ability to obtain the Transfer Function of a servo motor and represent systems using block diagrams and signal flow graphs. Can derive Transfer function of a system using block diagram or signal flow graph. • Students can obtain Time Domain specifications of second order systems and analyze the effect of proportionality controllers. • Students are able to comment on stability of a system from the given characteristics equation. They can locate roots in S-Domain and find critical value of open loop gain K for stability of system using root locus. • Able to analyze the stability of the system in frequency domain and obtaining its specifications. • Able to analyze the effect of Lag, Lead and Lag-Lead controllers in control systems and understand state variable analysis of systems and the relationship with state variables and transfer

			function.
		Electromagnetic Waves and Transmission Lines	<ul style="list-style-type: none"> • Able to know the most important distributions and their characteristics. • Able to know the distribution and density functions of multiple random variables and operations on multiple random variables. • An ability to characterize stochastic processes with an emphasis on stationary random processes • An ability to characterize stochastic processes with an emphasis on stationary random processes. • Able to know the response of linear system for random inputs. • Able to know types of noise.
		Analog Communications	<ul style="list-style-type: none"> • Students get familiarize with the fundamentals of analog communication systems • Students get familiarize with various techniques for analog modulation and demodulation of signals • Students can distinguish the figure of merits of various analog modulation methods • Students can develop the ability to classify and understand various functional blocks of radio transmitters and receivers • Students are able to learn different types of noise in communication systems. • Students get familiarize with basic techniques for generating and demodulating various pulse Modulated signals
		Pulse and Digital Circuits	<ul style="list-style-type: none"> • An in depth analysis of electro static and magneto static fields with help of Coulomb's Law, Gauss Law, Biot-Savart's Law and Ampere's Circuital Law. • Study time varying Maxwell's equations and describe the boundary conditions for electric and magnetic fields at dielectric interfaces. • Interpret the effects of lossy and low loss dielectrics and conductors upon the

			<p>propagation of electromagnetic waves, and predict this process in specific applications.</p> <ul style="list-style-type: none"> • Able to demonstrate the reflection and refraction of waves at boundaries. • Demonstrate and compute various parameters for transmission lines using either a smith chart or classical theory. • Design matching networks for loaded transmission lines.
		Management Science	<ul style="list-style-type: none"> • Able to understand the concept and nature of management evolution of management theories, motivation and leadership styles. • Able to equip with the concepts of operations project management and inventory control. • Able to understand the different functional areas in an organization and their responsibilities product life cycle and channels of distribution. • Able to equip with the concept and practical issues relating to strategic management. • Able to understand the need and imp of business ethics and communication skills in contemporary situations. • Able to equip the contemporary management practices i.e., MIS, MRP, JIT and ERP etc.
III/IV B.Tech ECE (R13)	I	Pulse And Digital Circuits	<ul style="list-style-type: none"> • Design linear and non-linear wave shaping circuits. • Apply the fundamental concepts of wave shaping for various switching and signal generating circuits. • Students can find the switching characteristics of diode and construct various logic gates and compare their performances. • Design different multivibrators for various electronic applications. • Ability to find the time base generators and knowing knowledge about Bootstrap base generators and its basic principles.

			<ul style="list-style-type: none"> Students will understand the principles of synchronization and frequency division and know the basic operating principles of sampling gates and their applications.
		Linear IC Applications	<ul style="list-style-type: none"> Demonstrate how differential amplifiers are designed and its analysis. Demonstrate about Op-amps functions and its specifications. Demonstrate about Linear and Non-Linear applications of Op-amps. Demonstrate about design of filters. Understand about analog multipliers, modulators and their operation. Analyze the Timers and Phase Locked Loop and its applications. Understand D/a and A/D conversions by using IC's.
		Control Systems	<ul style="list-style-type: none"> Understand the concept of control systems and able to represent Mechanical and electrical systems using Differential Equations. Ability to obtain the Transfer Function of a servo motor and represent systems using block diagrams and signal flow graphs. Can derive Transfer function of a system using block diagram or signal flow graph. Students can obtain Time Domain specifications of second order systems and analyze the effect of proportionality controllers. Students are able to comment on stability of a system from the given characteristics equation. They can locate roots in S-Domain and find critical value of open loop gain K for stability of system using root locus. Able to analyze the stability of the system in frequency domain and obtaining its specifications. Able to analyze the effect of Lag, Lead and Lag-Lead controllers in control systems and understand state variable analysis of systems and the relationship with state variables and transfer function.
			<ul style="list-style-type: none"> Ability to write VHDL programs for basic combinational and sequential

		<p>Digital System Design & Digital IC Applications</p>	<p>circuits.</p> <ul style="list-style-type: none"> • Learn the simulation and synthesis approaches and also the net list formats for design representation in VHDL. • Learn the internal circuits for different combinational PLDs such as PROM, PAL, PLA, memory(ROM AND RAM) • Design CMOS circuits and learn the static and dynamic electrical behavior of CMOS circuits and also learn TTL and emitter coupled logic. • Learn the internal circuits for different combinational ICs namely decoders, encoders, parity circuits, multiplexers, adders and also write VHDL programs for the ICs. • Learn the internal circuits for different sequential ICs such as Latches, flipflops, registers and counters and also write VHDL programs for the ICs.
		<p>Antennas And Wave-Propagation</p>	<ul style="list-style-type: none"> • Able to identify antenna parameters. • Able to Design and analyze wire antennas and loop antennas and Quantify the fields radiated by various types of antennas. • Able to design and analyze antenna arrays. • Able to design and analyze long wire antennas, micro strip antennas and helical antennas. • Able to design and analyze reflector antennas, lens antennas and horn antennas and measure their performance. • Able to identify the characteristics of radio wave propagation.
		<p>Intellectual Property Rights And Patents</p>	<ul style="list-style-type: none"> • Intellectual property law – evolutionary past – intellectual property law basics - types of intellectual property and over use or misuse of intellectual property rights - compliance and liability issues are understood. • Principles of copyright and limitations infringement of copyright – international copyright law-

			<p>semiconductor chip protection act are understood.</p> <ul style="list-style-type: none"> • Patent law – rights and limitations – rights under patent law – patent requirements and new developments in patent law- invention • Developers and promoters are understood. • Trade mark – trade mark registration process – post registration procedures and international trade mark law • Trade secrets – maintaining trade secret – physical security and breach of • Contract – applying state law are understood. • Cyber law – information technology act - cyber crime and e-commerce – data security – confidentiality – privacy - international • Aspects of computer and online crime are understood.
<p>III/IV B.Tech ECE (R13)</p>	<p>II</p>	<p>Microprocessors And Micro Controllers</p>	<ul style="list-style-type: none"> • Student can understand the basics of 8086 microprocessors • Student can understand how to use instructions with different addressing modes • Able to develop programs for different addressing modes in machine and assembly Languages • Able to interface 8086 with different peripherals and implement programs. • Ability to understand the microcontroller and able to write the programs on 8051 • Student can able to interface 8051 with industrial applications
		<p>Digital Signal Processing</p>	<ul style="list-style-type: none"> • Estimate the spectra of signals that are to be processed by a discrete time filters, and to verify the performance of a variety of modern and classical spectrum estimation techniques. • Able to define and use discrete Fourier transforms (DFTs). • Able to realize FIR, IIR filters and use Z-Transforms and discrete time Fourier transforms to analyze digital systems. • Able to design FIR, IIR filters.

			<ul style="list-style-type: none"> • Able to understand the concepts of decimation, interpolation. • Able to program a DSP processor to filter signals.
		Digital Communications	<ul style="list-style-type: none"> • Understand the working of Pulse Digital Modulation systems such as PCM, DPCM and DM. • Learn various digital Pass Band modulation techniques such as ASK, PSK , QPSK, DPSK and M-array PSK. • Analyze the performance of various digital modulation systems in terms of probability of error. • Understand the concepts of information theory and need for source coding. • Learnt the theorems governing the transmission of information over a NET channel and perform the efficiency calculations. • Perform channel coding using linear block codes, cyclic codes etc.
		Microwave Engineering	<ul style="list-style-type: none"> • Study about the microwave frequencies and waveguides that are used to carry them, various parameters and characteristics of the rectangular waveguides. • Study the various parameters and characteristics of the circular waveguide, micro strip lines and cavity resonators. • Implement waveguide components and devices for various applications. • Analyze mathematically the operation of the various tubes or sources used for the transmission of the microwave frequencies. • Study the significance, types and characteristics of slow wave structures and cross fields tubes used for the transmission of the microwave frequencies. • Analyze the significance, types and characteristics of microwave solid state devices and acquire knowledge in various microwave measurements.
		Bio Medical	<ul style="list-style-type: none"> • Understand the origin of Bio potential and how to measure various

		Engineering	<p>psychological parameters from human body.</p> <ul style="list-style-type: none"> • Understand the principles involved in electrodes and transducers used to acquire different bio potentials. • Learn about the positioning and functioning of the cardio vascular system, measurement of parameters related to cardiology, to understand the basic knowledge about measurements of parameters related to respiratory system. • Gain knowledge about fundamental issues and elements of patient care in ICU and organization of hospitals with quality care, ability to understand diagnosis and therapy related equipments. • Learn ultra sound imaging techniques and its usefulness in diagnosis and different types of radio diagnostic techniques. • Understand the importance of patient's safety against electrical hazards, functioning of amplifiers, display devices and signal recorders.
IV/ IV R10	I	Optical Communication	<ul style="list-style-type: none"> • Students will be able to choose necessary components required in modern optical communication systems. • Student can know the properties of optical fiber that affect the performance of a Communication link and Design and build optical fiber experiments in the lab and learn how to calculate electromagnetic modes in waveguides. • Students can know the properties of optical fibers and the amount of light lost going through an optical system, dispersion of optical fibers. • Students will be able to know the working of semiconductor lasers and analyze the operation of LEDs and ALSER diodes. • Students will be able to know the principles of single and multi-mode optical fibers and their characteristics. • Students will be able to know the Types of photo diode sand analyze the optical

			fiber and light wave systems.
		Embedded Systems	<ul style="list-style-type: none"> • Understand the building blocks of typical embedded system and different memory technology and memory types. • Learn about communication devices. • Learn concept of firmware design approaches, ISR concept and interrupt sources. • Learn an Operating system and learn how to choose an RTOS, focusing on common underlying modeling concepts, the design of hardware-software interface. • Understand the IDE and hardware debugging. • Understand the debugging tools and testing tools.
		Digital Image Processing	<ul style="list-style-type: none"> • Perform different transforms on image useful for image processing Applications • Perform spatial and frequency domain filtering on image. • Implement all smoothing and sharpening operations on images and perform frequency domain filtering. Perform image restoration operations/techniques on images. • Operate effectively on color images and different color conversions • on images and can code images to achieve good compression • Do wavelet based image processing and image compression using Wavelets • Perform all morphological operations on images and can be able to do image segmentation also.
		Radar Systems	<ul style="list-style-type: none"> • Know the concept of Radar and its applications. • Acquires knowledge on all parameters in the radar range equation and are able to find them. • Learn the concept of Doppler effect and are able to measure parameters of radar using it. • Know the two types of radars used to find moving targets and their

			<p>applications based on the types of transmitters, receivers and their functions.</p> <ul style="list-style-type: none"> • Gains knowledge on different types of tracking radars and their applications. • Acquires knowledge on different antennas. • Gains knowledge on the concept of matched filter receiver and various detection criteria used to detect signal from received echo signal. • Acquires knowledge on various communication equipment required for operation of radar.
		<p>Telecommunication Switching Systems</p>	<ul style="list-style-type: none"> • Introduce telecommunication switching systems and operation of different switching systems. • Obtain the knowledge of different automatic switching systems. • Analyze the performance of telecommunication network and implement the signaling techniques in communication networks. • Obtain the knowledge of network architecture and its protocols. • Gained understanding on different switching networks and interconnecting services. • Introduced ISDN and BISDN services in existing data networks.
		<p>Object Oriented Programming and Operating Systems</p>	<ul style="list-style-type: none"> • Will be able to describe the Object Oriented Concepts. • Will be able to describe General Architecture of Computers. • Will be able to understand and analyze the theory and implementation of Processors. • Will be able to understand and implementation of Physical memory. • Will be able to understand and implementation of Virtual memory. • Will be able to understand and implementation of I/O memory.

		<p align="center">Energy Audit, Conservation & Management(Open Elective)</p>	<ul style="list-style-type: none"> • Explain energy efficiency, conservation and various technologies. • Design energy efficient lighting systems. • Calculate power factor of systems and propose suitable compensation techniques. • Explain energy conservation in HVAC systems. • Calculate life cycle costing analysis and return on investment on energy efficient technologies.
		<p align="center">Instrumentation</p>	<ul style="list-style-type: none"> • Select the instrument to be used based on the requirements. • Understand and analyze different signal generators and analyzers. • Understand the design of oscilloscopes for different applications. • Design different transducers for measurement of different parameters.
<p align="center">IV/IV B.Tech (R10)</p>	<p align="center">II</p>	<p align="center">Cellular And Mobile Communications</p>	<ul style="list-style-type: none"> • Introduced cellular mobile radio system and how operation takes place in mobile radio environment • Be acquainted with different interference factors influencing cellular and mobile communication and be able to Efficiently used the background behind developing different path loss and/or radio coverage in cellular environment • Gain the understanding of cell site antennas and mobile antennas • Acquainted with the role of cellular and mobile communication in frequency management issues • Acquainted with different interference factors influencing cellular and mobile communication • Obtained the knowledge of different handoff techniques and how dropped calls exist and gain the knowledge of digital cellular networks in different generations
		<p align="center">Network Security and Cryptography</p>	<ul style="list-style-type: none"> • Be able to individually reason about software security problems and

			<p>protection techniques on both an abstract and a more technically advanced level.</p> <ul style="list-style-type: none"> • Be able to individually explain how software exploitation techniques, used by adversaries, function and how to protect against them
		Control Systems	<ul style="list-style-type: none"> • Ability to derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs. • Capability to determine time response specifications of second order systems and to determine error constants. • Acquires the skill to analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method. • Capable to analyze the stability of LTI systems using frequency response methods. • Able to design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams. • Ability to represent physical systems as state models and determine the response. Understanding the concepts of controllability and observability.
		Satellite Communications	<ul style="list-style-type: none"> • Student will be able to know on history, applications and frequency oscillations of SATELLITE COMMUNICATIONS s/ms. • Student can learn fundamentals of SATELLITE COMMUNICATIONS s/ms. • Student can learn various commands and controlling s/ms of SATELLITES. • Student will be able to design uplink and down link for SATELLITE COMMUNICATIONS s/ms and understand various multiple access techniques. • Student will be able to understand working of various SATELLITE COMMUNICATIONS transmitters and receivers and their installation, coverage

			<p>and frequency considerations for efficient COMMUNICATION.</p> <ul style="list-style-type: none"> • Student will be able to get exposure on working principle of GPS.
		Embedded Systems	<ul style="list-style-type: none"> • Understand the building blocks of typical embedded system and different memory technology and memory types. • Learn about communication devices. • Learn concept of firmware design approaches, ISR concept and interrupt sources. • Learn an Operating system and learn how to choose an RTOS, focusing on common underlying modeling concepts, the design of hardware-software interface. • Understand the IDE and hardware debugging. • Understand the debugging tools and testing tools.
		Wireless Sensor Networks	<ul style="list-style-type: none"> • Importance of Wireless Sensor networks and the challenges faced in designing Sensor nodes and Wireless Sensor Networks was understood. • Topologies of PANs, MANETs and WANets was understood. • Understood the issues in designing MAC protocols and different MAN protocols used in WSN. • Understood the issues in designing routing protocols for WSN and different routing protocols used in WSN. • Understood the issues in designing transport layer protocols for WSN. • Understood types of security attacks in WSN and also provide security in WSN. Understood sensor types and applications.
		Real Time Operating Systems	<ul style="list-style-type: none"> • Will understand real-time operating system- OS services, process & memory management, timer and event functions, RTOS task scheduling models • Will understand real-time operating system programming-I- basic functions and types of RTOS for embedded

			<p>systems</p> <ul style="list-style-type: none"> • Will understand real-time operating system programming-II- programming concepts of RTOS windows CE, RTOS OSEK, RTOS LINUX 2.6.X AND RTOS RT LINUX. • Will understand the design examples and case studies of program modelling with RTOS-I • Will understand design examples • Do case studies of program modeling with RTOS-II • Will understand target image creation • Will understand the programming in Linux.
		<p>Television Engineering</p>	<ul style="list-style-type: none"> • Know basics of television pictures, composite video signal, colour signal generation and encoding. • Know about television signal propagation and T.V transmission antennas. • Focusing to learn about camera tube types i.e monochrome TV camera and colour TV camera • Focusing about picture tubes. And TV standards : American 525 line B&W TV system, NTSC colour system,625 line monochrome system • Focusing about monochrome TV receiver . PAL-D colour receiver. • Understanding of vision IF subsystem and receiver sound system, tv receiver tuners. • Understanding of PAL-D decoder, chroma signal amplifiers and colour signal mixing. • Understanding about sync separation, AFC and deflection oscillators.

I/II M.Tech ECE	I	Detection & Estimation Theory	<ul style="list-style-type: none"> • Acquire basics of statistical decision theory used for signal detection and estimation. • Examine the detection of deterministic and random signals using statistical models. • Analyze signal estimation in discrete-time domain using filters. • Examine the performance of signal parameters using optimal estimators. • Comprehend the parameters of random processes from data using different functions.
		Digital Data Communications	<ul style="list-style-type: none"> • Able to identify the properties of Digital Modulation Schemes. • Able to Understand Overview of various Data Communication devices. • Able to Understand Overview of various errors Control methods and data link protocols. • Able to understand the basic principles of multiplexing and different networks. • Able to understand the basic principles of various multiple access techniques
		VLSI Design	<ul style="list-style-type: none"> • Understand the various IC design processing national and sequential design techniques. • Understand the various fabrication steps of IC and concepts and techniques of modern integrated circuit design and testing. • The various basic electrical properties of MOS transistors and applying technology specific layout design rules in the placement and routing of transistors. • Understand the design static CMOS combinational and sequential logic at the transistor level including mask layout. • Understand place and root methods with OFF chip connections and architecture testing.
		Advanced Digital Signal Processing	<ul style="list-style-type: none"> • Understand the concepts of multi rate signal processing. • Understand the applications of multi rate signal processing. • Gain knowledge on non-parametric methods of power spectral estimation. • Gain knowledge on parametric methods of power spectral estimation. • To understand the implementation of digital filters.

			<ul style="list-style-type: none"> Gain knowledge on parametric methods of power spectral estimation.
		Statistical Signal Processing	<ul style="list-style-type: none"> Ability to generalize the statistical models. Able to analyze the various non parametric methods for power spectral density estimation. Able to understand the review of stochastic signals and systems fundamentals random process, white noise, auto and cross correlation functions, spectral and cross spectral densities, properties of linear time-invariant systems excited by white noise and to learn basic estimation methods like MLE, MAP. Able to differentiate the prominence of various spectral estimation techniques. Able to design and development of optimum filters using classical and adaptive algorithms.
		Digital System Design	<ul style="list-style-type: none"> Able to study minimization of switching functions using tabulation of k-maps CAMP algorithms and cube based operations. Able to study different kinds of PLDs like PROM, PLA, PAL and minimization techniques of PLAs. Able to study ASM charts and design of large scale circuits using FPGAs. Able to study different kinds of fault classes in combination circuits. Able to study different kinds of fault classes in sequential circuits using machine identification techniques.
I/II M. Tech ECE	II	Coding Theory & Applications	<ul style="list-style-type: none"> Analyze the number of bits in the given information, detect and correct the error using linear block codes. Analyze the number of errors detected and corrected using cyclic codes. Analyze the number of errors detected and corrected using Convolution codes. Analyze the number of errors corrected using Burst Error Correcting codes. Analyze the number of errors corrected using BCH codes.
		Satellite Communications	<ul style="list-style-type: none"> Understand the concepts, applications and subsystems of Satellite communications. Derive the expression for G/T ratio and to solve some analytical problems on satellite link design. Understand the various types of multiple

			<p>access techniques and architecture of earth station design.</p> <ul style="list-style-type: none"> • Understand the concepts of GPS and its architecture.
		<p>Wireless Sensors And Networks (Elective-III)</p>	<ul style="list-style-type: none"> • Importance of Wireless Sensor Networks and the challenges faced in designing Sensor nodes and Wireless Sensor Networks was understood • Topologies of PANs, MANETs and WANETs was understood. • Understood the issues in designing MAC protocols and different MAC protocols used in WSN. • Understood the issues in designing routing protocol for WSN and different routing protocols used in WSN. • Understood the issues in designing transport layer protocols for WSN. • Understood types of security attacks in WSN and also protocol providing security in wireless sensor networks. Understood sensor network platforms and tools and it's applications in our daily life.
		<p>Embedded & Real Time Systems</p>	<ul style="list-style-type: none"> • Students can be able to understand the introduction to an embedded system and their current technologies. • Students can be able to understand the embedded hardware building blocks and various memory types. • Students can be able to understand the device drivers for interrupt handling and various embedded OS. • Students can be able to create ES architecture and various debugging tools. • Students can be able to understand the considerations while designing an ES.
		<p>Image & Video Processing</p>	<ul style="list-style-type: none"> • Describe basic fundamentals of digital image processing, image transform used in digital image processing. • Explain various image enhancement and restoration techniques and examine various types of images, intensity transformations and spatial filtering. • Evaluate the methodologies for segmentation and compression process and describe wavelet based compression schemes. • Explain about analog and digital video and common video system design problems and

			<p>describe sampling and filtering concepts.</p> <ul style="list-style-type: none"> Analyze the concepts of motion estimation algorithms and their applications in video coding.
		<p>Wireless Communications & Networks</p>	<ul style="list-style-type: none"> Get acquainted with the basic cellular system concepts and system design fundamentals. Understand the radio propagation mechanisms and various large scale fading models. Analyze the concept of small scale fading and study various fading models. Obtain the knowledge of various equalization and diversity techniques. Study various wireless networks such as WLAN, WPAN, HYPE and WLL.
		<p>CMOS Analog & Digital IC Applications</p>	<ul style="list-style-type: none"> Students can be able to understand the MOS device modeling and MOS device design in real time applications. Students can be able to understand the combinational MOS logic circuits and sequential MOS logic circuits. Students can be able to understand the dynamic logic circuits and their working with applications and semi conductor memories. Students can be able to create some basic analog CMOS sub circuits and design the current sources and current sinks for the design of analog circuits. Students can be able to understand the design of CMOS amplifiers and CMOS operations amplifiers for various analog and digital applications.
		<p>Digital Signal Processors & Architectures</p>	<ul style="list-style-type: none"> Understand the concepts of Digital signal processing. Understand the concepts of Architectures for programmable DSP devices. Gain knowledge on Programmable digital signal processors. To understand the principles of Analog devices family of DSP devices. Gain knowledge on various interfacing memory and I/O peripherals to programmable DSP devices.

Computer Science Engineering

YEAR	SEMESTER	SUBJECT	COS
I	I	ENGLISH - I	<ul style="list-style-type: none"> • The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly. • The lesson motivates the public to adopt road safety measures • The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival. • The lesson helps to choose a source of energy suitable for rural India. • The lesson creates an awareness in the reader as to the usefulness of animals for the human society. • The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace
I	I	MATHEMATICS- I (Common to all Branch's for I Year B. Tech)	<ul style="list-style-type: none"> • Solve linear differential equations of first, second and higher order. • Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE. • Calculate total derivative, Jacobian and minima of functions of two variables.
I	I	ENGINEERING CHEMISTRY	<p>□ The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano-materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.</p>
		Engineering Mechanics	<ul style="list-style-type: none"> • concepts of force and friction, direction and its application • application of free body diagrams. Solution to problems using graphical methods and law of triangle of forces

			<ul style="list-style-type: none"> • concepts of centre of gravity • concepts of moment of inertia and polar moment of inertia including transfer methods and their applications • motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion • concepts of work, energy and particle motion
I	I	COMPUTER PROGRAMMING	<ul style="list-style-type: none"> • Write, compile and debug programs in C language. • Use different data types in a computer program. • Design programs involving decision structures, loops and functions. • Explain the difference between call by value and call by reference • Understand the dynamics of memory by the use of pointers <input type="checkbox"/> Use different data structures and create/update basic data files.
I	I	ENVIRONMENTAL STUDIES	<ul style="list-style-type: none"> • The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources • The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web • The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity • Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices • Social issues both rural and urban environment and the possible means to combat the challenges • The environmental legislations of India and the first global initiatives towards sustainable development • . • About environmental assessment and the stages involved in EIA and the environmental audit. • • Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum.

I	II	ENGLISH -II	<ul style="list-style-type: none"> • The lesson underscores that the ultimate aim of Education is to enhance wisdom. • The lesson enables the students to promote peaceful co-existence and universal harmony among people and society. • The Achievements of C V Raman are inspiring and exemplary to the readers and all scientists. • The lesson imparts the students to manage different cultural shocks due to globalization. • The lesson highlights insightful commentary on cultural traditions. • The lesson offers several inputs to protect environment for the sustainability of the future generations.
I	II	MATHEMATICS – II (MATHEMATICAL METHODS)	<ul style="list-style-type: none"> • Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators. • Compute interpolating polynomial for the given data. • Solve ordinary differential equations numerically using Euler’s and RK method. • Find Fourier series and Fourier transforms for certain functions. • Identify/classify and solve the different types of partial differential equations.
I	II	MATHEMATICS- III	<ul style="list-style-type: none"> • Determine rank, Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations. • Solve simultaneous linear equations numerically using various matrix methods. • Determine double integral over a region and triple integral over a volume. • Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.
I	II	ENGINEERING PHYSICS	<ul style="list-style-type: none"> • Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials
I	II	Professional Ethics and Human Values	<ul style="list-style-type: none"> • It gives a comprehensive understanding of a variety issues that are encountered by every

			<p>professional in discharging professional duties.</p> <ul style="list-style-type: none"> • It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively
I	II	Engineering Drawing	<ul style="list-style-type: none"> • To introduce the use and the application of drawing instruments and to make the students construct the polygons, curves and various types of scales. The student will be able to understand the need to enlarge or reduce the size of objects in representing them. • To introduce orthographic projections and to project the points and lines parallel to one plane and inclined to other. • To make the students draw the projections of the lines inclined to both the planes. • To make the students draw the projections of the plane inclined to both the planes. • To make the students draw the projections of the various types of solids in different positions inclined to one of the planes. • To represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.
II	I	Managerial Economics and Financial Analysis	<ul style="list-style-type: none"> • Understand the market dynamics namely, demand and supply, demand forecasting, elasticity of demand and supply, pricing methods and pricing in different market structures. • Gain an insight into how production function is carried out to achieve least cost combination of inputs and cost analysis. • Develop an understanding of • Analyse how capital budgeting decisions are carried out. • Understanding the framework for both manual and computerised accounting process • Know how to analyse and interpret the financial statements through ratio analysis.
		Object Oriented Programming	<ul style="list-style-type: none"> • Students can gain knowledge about basics on OOPS principles and evaluation of OOPS • Students can able to develop programs

		through C++	<p>using control structures and overloading and programs on recursion</p> <ul style="list-style-type: none"> • Students can acquire knowledge on classes, objects and members. • An ability to develop programs on operator overloading constructors, destructors • An ability to develop programs on inheritance and virtual functions. • Student can learn files and its operations, types of templates and exceptional handling mechanisms.
		Mathematical Foundations of Computer Science	<ul style="list-style-type: none"> • Ability to illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations. • Ability to demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology. • Ability to represent and Apply theory in solving computer science problems
		Digital Logic Design	<ul style="list-style-type: none"> • After this course student could able to design, understand the number systems, combinational sequential circuits. And they should be in a position to continue with computer organization.
		Data Structures	<ul style="list-style-type: none"> • Learn how to use data structure concepts for realistic problems. • Ability to identify appropriate data structure for solving computing problems in respective language. • Ability to solve problems independently and think critically
II	II	PROBABILITY AND STATISTICS	<ul style="list-style-type: none"> • Apply knowledge of math, science, & engineering • Design & conduct experiments, analyze & interpret data • Design a system/process to meet desired needs within economic, social, political, ethical, health/safety, manufacturability, & sustainability constraints d) Function on multidisciplinary teams

			<ul style="list-style-type: none"> • Identify, formulate, & solve engineering problems • Understand professional & ethical responsibilities Communicate effectively • Understand impact of engineering solutions in global, economic, environmental, & societal context • Recognize need for & be able to engage in lifelong learning • Know contemporary issues • Use techniques, skills, modern tools for engineering practices
II	II	JAVA PROGRAMMING	<ul style="list-style-type: none"> • Implementing programs for user interface and application development using core java principles
II	II	ADVANCED DATA STRUCTURES	<ul style="list-style-type: none"> • Exposed to hashing approaches, variants of trees , heaps, queues, implementation of graph algorithms, analysis of sorting algorithms with respect to bounds and file organizations and operations
II	II	COMPUTER ORGANIZATION	<ul style="list-style-type: none"> • Comprehensive knowledge of computer system including the analysis and design of components of the system • Gives a view of computer system from user's perspective, representation of data • Understanding RTL, Micro operations, ALU, Organization of stored program computer, types of instructions and design of basic components of the system. • Illustration of data paths and control flow for sequencing in CPUs, Microprogramming of control unit of CPU • Illustration of algorithms for basic

			<p>arithmetic operations using binary and decimal representation</p> <ul style="list-style-type: none"> • Description of different parameters of a memory system, organization and mapping of various types of memories
II	II	Formal Languages And Automata Theory	<ul style="list-style-type: none"> • Analysis of Finite state machine, its representation and automata • Delineation of various components of formal languages and grammars. • Description of finite automata, variants in it and their equivalence • Minimization, optimization of finite automata, regular expressions and equivalence of finite automata and regular expressions • Illustration about grammars, classification and simplification of grammars • Delineation of turing machines
III/IV R13	I	Compiler Design	<ul style="list-style-type: none"> • To introduce the major concept areas of language translation and compiler design • To develop an awareness of the function and complexity of compilers. • To provide practical, hands on experience in compiler design • Identify the similarities and differences among various parsing techniques and grammar transformation techniques
		Data Communication	<ul style="list-style-type: none"> • Knowledge of working of basic communication systems • Ability to evaluate alternative models of communication system design
		Principles of Programming Languages	<ul style="list-style-type: none"> • Describe syntax and semantics of programming languages • Explain data, data types, and basic statements of programming languages • Design and implement subprogram constructs, Apply object - oriented, concurrency, and event handling programming constructs

			<ul style="list-style-type: none"> • Develop programs in Scheme, ML, and Prolog • Understand and adopt new programming languages
		<p style="text-align: center;">Database Management Systems</p>	<ul style="list-style-type: none"> • Define a Database Management System give a description of the Database Management structure • Understand the applications of Databases • Know the advantages and disadvantages of the different models • Compare relational model with the Structured Query Language (SQL) • Know the constraints and controversies associated with relational database model. • know the rules guiding transaction ACID • Understand the concept of data planning and Database design • Identify the various functions of Database Administrator
		<p style="text-align: center;">Operating Systems</p>	<ul style="list-style-type: none"> • Describe the general architecture of computers describe, contrast and compare differing structures for operating Systems • Understand and analyse theory and implementation of: processes, resource • Control (concurrency etc.), physical and virtual memory, scheduling, I/O and files
<p style="text-align: center;">III</p>	<p style="text-align: center;">II</p>	<p style="text-align: center;">Computer Networks</p>	<ul style="list-style-type: none"> • Independently understand basic computer network technology. • Identify the different types of network topologies and protocols. • Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
		<p style="text-align: center;">Data Ware housing and Mining</p>	<ul style="list-style-type: none"> • understand why there is a need for data warehouse in addition to traditional operational database systems; • Identify components in typical data warehouse architectures; • Design a data warehouse and understand the process required to construct one; • Understand why there is a need for data mining and in what ways it is different from traditional statistical techniques; • understand the details of different algorithms made available by popular commercial data mining software; • solve real data mining problems by using the right tools to find interesting patterns

		<p style="text-align: center;">Design and Analysis of Algorithms</p>	<ul style="list-style-type: none"> • Analyze worst-case running times of algorithms using asymptotic analysis. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. • Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. • Describe the greedy paradigm and explain when an algorithmic design situation calls for it. • Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate. Synthesize new graph algorithms and algorithms that employ graph computations as key components, and analyze them. • Explain the different ways to analyze randomized algorithms (expected running time, probability of error). Recite algorithms that employ randomization. Explain the difference between a randomized algorithm and an algorithm with probabilistic inputs. • Analyze randomized algorithms. Employ indicator random variables and linearity of expectation to perform the analyses. Recite analyses of algorithms that employ this method of analysis.
		<p style="text-align: center;">Software Engineering</p>	<ul style="list-style-type: none"> • Knowledge of basic SW engineering methods and practices, and their appropriate application; • General understanding of software process models such as the waterfall and evolutionary models. scheduling, risk management, etc. • Understanding of the role of project management including planning, • Understanding of software requirements and the SRS document. • Understanding of different software architectural styles coding standards. modularity and • Understanding of implementation issues such as static analysis, and reviews. • Understanding of approaches to verification and validation including such as unit testing and integration testing. • Understanding of software testing

			<p>approaches</p> <ul style="list-style-type: none"> • Understanding of software evolution and related issues such as version management. • Understanding on quality control and how to ensure good quality software. • Understanding of some ethical and professional issues that are important for software engineers. • Development of significant teamwork and project based experience
		Web Technologies	<ul style="list-style-type: none"> • Analyze a web page and identify its elements and attributes. • Create web pages using XHTML and Cascading Styles sheets. • Build dynamic web pages . • Build web applications using PHP. • Programming through PERL and Ruby • write simple client-side scripts using AJAX
IV	I	Cryptography and Network Security	<ul style="list-style-type: none"> • Be able to individually reason about software security problems and protection techniques on both an abstract and a more technically advanced level. • Be able to individually explain how software exploitation techniques, used by adversaries, function and how to protect against them
		UML & Design Patterns	<ul style="list-style-type: none"> • Identify the purpose and methods of use of common object-oriented design patterns • Select and apply these patterns in their own designs for simple programs • Represent the data dependencies of a simple program using UML • Represent user and programmatic interactions using UML • Create design documentation outlining the testable and complete design of a simple

			<p>program</p> <ul style="list-style-type: none"> • Produce and present documents for the purpose of capturing software requirements and specification • Produce plans to limit risks specific to software designed for use in a particular social context
		<p>Data Ware Housing and Data Mining</p>	<ul style="list-style-type: none"> • Understand why there is a need for data warehouse in addition to traditional operational database systems; • Identify components in typical data warehouse architectures; • Design a data warehouse and understand the process required to construct one; • Understand why there is a need for data mining and in what ways it is different from traditional statistical techniques; • Understand the details of different algorithms made available by popular commercial data mining software; • Solve real data mining problems by using the right tools to find interesting patterns
		<p>Mobile Computing</p>	<ul style="list-style-type: none"> • Able to think and develop new mobile application. • Able to take any new technical issue related to this new paradigm and come up with a solution(s). • Able to develop new ad hoc network applications and/or algorithms/protocols. • Able to understand & develop any existing or new protocol related to mobile

			environment
		Software Project Management(elective 2)	<ul style="list-style-type: none"> • To match organizational needs to the most effective software development model • To understand the basic concepts and issues of software project management • To effectively Planning the software projects • To implement the project plans through managing people, communications and change • To select and employ mechanisms for tracking the software projects • To conduct activities necessary to successfully complete and close the Software projects • To develop the skills for tracking and controlling software deliverables • To create project plans that address real-world management challenges
IV	II	Human Computer Interaction	<ul style="list-style-type: none"> • Design, implement and evaluate effective and usable graphical computer interfaces. • Describe and apply core theories, models and methodologies from the field of HCI. • Describe and discuss current research in the field of HCI. • Implement simple graphical user interfaces using the Java Swing toolkit. • Describe special considerations in designing user interfaces for older adults.
		Multimedia & Application Development	<ul style="list-style-type: none"> • Developed understanding of technical aspect of Multimedia Systems.

			<ul style="list-style-type: none"> • Understand various file formats for audio, video and text media. • Develop various Multimedia Systems applicable in real time. • Design interactive multimedia software. • Apply various networking protocols for multimedia applications. 6. To evaluate multimedia application for its optimum performance.
		E- Commerce	<ul style="list-style-type: none"> • Define and differentiate various types of Ecommerce. • Describe Hardware and Software Technologies for Ecommerce. • Explain payment systems for E-commerce. • Describe the process of Selling and Marketing on web. • Define and Describe E-business and its Models. • Discuss various E-business Strategies
		Distributed Systems	<ul style="list-style-type: none"> • Explain and understand the concept of a transaction and how ACID properties are maintained when concurrent transaction occur in a database • Measure query costs and design alternate efficient paths for query execution. • Apply sophisticated access protocols to control access to the database. • Implement alternate models like Distributed databases and Design applications using advanced models like mobile, spatial databases.

			<ul style="list-style-type: none">• Organize strategic data in an enterprise and build a data Warehouse.• Analyze data using OLAP operations so as to take strategic decisions.
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M.Tech

YEAR	SEMESTER	SUBJECT	COS
I	I	ADVANCED DATA STRUCTURE AND ALGORITHM ANALYSIS	<ul style="list-style-type: none">• Ability to write and analyze algorithms for algorithm correctness and efficiency• Master a variety of advanced abstract data type (ADT) and data structures and their implementation.• Demonstrate various searching, sorting and hash techniques and be able to apply and solve problems of real life• Design and implement variety of data structures including linked lists, binary trees, heaps, graphs and search trees• Ability to compare various search trees and find solutions for IT related problem
		MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE	<ul style="list-style-type: none">• To apply the basic rules and theorems of probability theory such as Baye's Theorem, to determine probabilities that help to solve engineering problems and to determine the expectation and variance of a random variable from its distribution.• Able to perform and analyze of sampling, means, proportions, variances and estimates the maximum likelihood based on population parameters.• To learn how to formulate and test hypotheses about sample means, variances and proportions and to draw conclusions based on the results of statistical tests.• Design various ciphers using number theory.

			<ul style="list-style-type: none"> • Apply graph theory for real time problems like network routing problem.
		<p style="text-align: center;">COMPUTER ORGANIZATION AND ARCHITECTURE</p>	<ul style="list-style-type: none"> • Understand the fundamentals of different instruction set architectures and their relationship to the CPU design. • Understand the principles and the implementation of computer arithmetic and ALU. • Understand the memory system, I/O organization • Understand the operation of modern CPUs including interfacing, pipelining, memory systems and busses. • Understand the principles of operation of multiprocessor systems. • Demonstrate the relationship between the software and the hardware and focuses on the foundational concepts that are the basis for current computer design.
		<p style="text-align: center;">DATABASE MANAGEMENT SYSTEMS</p>	<ul style="list-style-type: none"> • Define a Database Management System • Give a description of the Database Management structure • Understand the applications of Databases • Know the advantages and disadvantages of the different models • Compare relational model with the Structured Query Language (SQL) • Know the constraints and controversies associated with relational database model. • Know the rules guiding transaction

			<p>ACID</p> <ul style="list-style-type: none"> • Understand the concept of data planning and Database design • Identify the various functions of Database Administrator
		<p>ADVANCED OPERATING SYSTEMS</p>	<ul style="list-style-type: none"> • Illustrate on the fundamental concepts of distributed operating systems, its architecture and distributed mutual exclusion. • Analyze on deadlock detection algorithms and agreement protocols. • Make use of algorithms for implementing DSM and its scheduling. • Apply protection and security in distributed operating systems. • Elaborate on concurrency control mechanisms in distributed database systems
		<p>DATA WAREHOUSING AND DATA MINING</p>	<ul style="list-style-type: none"> • Understand why there is a need for data warehouse in addition to traditional operational database systems; • Identify components in typical data warehouse architectures; • Design a data warehouse and understand the process required to construct one; • Understand why there is a need for data mining and in what ways it is different from traditional statistical techniques; • Understand the details of different algorithms made available by popular commercial data mining software; • Solve real data mining problems by using the right tools to find interesting

			patterns
	II	CYBER SECURITY	<ul style="list-style-type: none"> Information Security architecture principles Identifying System and application security threats and vulnerabilities Identifying different classes of attacks Cyber Security incidents to apply appropriate response Describing risk management processes and practices Evaluation of decision making outcomes of Cyber Security scenarios
		COMPUTER NETWORKS	<ul style="list-style-type: none"> Independently understand basic computer network technology. Identify the different types of network topologies and protocols Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
		BIG DATA ANALYTICS	<ul style="list-style-type: none"> Illustrate on big data and its use cases from selected business domains. Interpret and summarize on No SQL, Cassandra Analyze the HADOOP and Map Reduce technologies associated with big data analytics and explore on Big Data applications Using Hive. Make use of Apache Spark, RDDs etc. to work with datasets. Assess real time processing with Spark Streaming.
		ADVANCED UNIX	<ul style="list-style-type: none"> Describe and use the UNIX operating

		PROGRAMMING	<p>system and shells.</p> <ul style="list-style-type: none"> • Describe and use the fundamental Unix File System and I/O utilities. • Describe and write shell scripts, process. • Describe and understand the memory management, IPC, Message Queues in Unix • Describe and understand the Semaphores and Shared Memory in Unix
		SOFTWARE ENGINEERING (elective 1)	<ul style="list-style-type: none"> • Apply the Object Oriented Software-Development Process to design software • Analyze and Specify software requirements through a SRS documents. • Design and Plan software solutions to problems using an object-oriented strategy. • Model the object oriented software systems using Unified Modeling Language (UML) • Estimate the cost of constructing object oriented software
		CLOUD COMPUTING (elective 2)	<ul style="list-style-type: none"> • Understanding the key dimensions of the challenge of Cloud Computing • Assessment of the economics ,financial, and technological implications for selecting cloud computing for own organization • Assessing the financial, technological, and organizational capacity of employer’s for actively initiating and installing cloud-based applications. • Assessment of own organizations’ needs for capacity building and training in cloud computing-related IT areas

Information Technology

YEAR	SEMESTER	SUBJECT	COS
I	I	ENGLISH - I	<ul style="list-style-type: none"> • The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly. • The lesson motivates the public to adopt road safety measures • The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival. • The lesson helps to choose a source of energy suitable for rural India. • The lesson creates awareness in the reader as to the usefulness of animals for the human society. • The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace
I	I	MATHEMATICS-I (Common to all Branch's for I Year B. Tech)	<ul style="list-style-type: none"> • Solve linear differential equations of first, second and higher order. • Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE. • Calculate total derivative, Jacobian and minima of functions of two variables.
I	I	ENGINEERING CHEMISTRY	<ul style="list-style-type: none"> • The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano-materials and fullerenes and their uses. Similarly liquid crystals

			<p>and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.</p>
		<p>Engineering Mechanics</p>	<ul style="list-style-type: none"> • concepts of force and friction, direction and its application • Application of free body diagrams. Solution to problems using graphical methods and law of triangle of forces • concepts of centre of gravity • concepts of moment of inertia and polar moment of inertia including transfer methods and their applications • motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion • concepts of work, energy and particle motion
I	I	<p>COMPUTER PROGRAMMING</p>	<ul style="list-style-type: none"> • Write, compile and debug programs in C language. • Use different data types in a computer program. • Design programs involving decision structures, loops and functions. • Explain the difference between call by value and call by reference • Understand the dynamics of memory by the use of pointers • Use different data structures and create/update basic data files.
I	I	<p>ENVIRONMENTAL STUDIES</p>	<ul style="list-style-type: none"> • The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources • The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web

			<ul style="list-style-type: none"> • The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity • Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices • Social issues both rural and urban environment and the possible means to combat the challenges • The environmental legislations of India and the first global initiatives towards sustainable development • About environmental assessment and the stages involved in EIA and the environmental audit. • Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum.
I	II	ENGLISH -II	<ul style="list-style-type: none"> • The lesson underscores that the ultimate aim of Education is to enhance wisdom. • The lesson enables the students to promote peaceful co-existence and universal harmony among people and society. • The Achievements of C V Raman are inspiring and exemplary to the readers and all scientists. • The lesson imparts the students to manage different cultural shocks due to globalization. • The lesson highlights insightful commentary on cultural traditions. • The lesson offers several inputs to protect environment for the sustainability of the future generations.
I	II	MATHEMATICS – II (MATHEMATICAL	<ul style="list-style-type: none"> • Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.

		METHODS)	<ul style="list-style-type: none"> • Compute interpolating polynomial for the given data. • Solve ordinary differential equations numerically using Euler's and RK method. • Find Fourier series and Fourier transforms for certain functions. • Identify/classify and solve the different types of partial differential equations.
I	II	MATHEMATICS- III	<ul style="list-style-type: none"> • Determine rank, Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations. • Solve simultaneous linear equations numerically using various matrix methods. • Determine double integral over a region and triple integral over a volume. • Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.
I	II	ENGINEERING PHYSICS	<ul style="list-style-type: none"> • Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials
I	II	Professional Ethics and Human Values	<ul style="list-style-type: none"> • It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties. • It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively
I	II	Engineering Drawing	<ul style="list-style-type: none"> • To introduce the use and the application of drawing instruments and to make the students construct the

			<p>polygons, curves and various types of scales. The student will be able to understand the need to enlarge or reduce the size of objects in representing them.</p> <ul style="list-style-type: none"> • To introduce orthographic projections and to project the points and lines parallel to one plane and inclined to other. • To make the students draw the projections of the lines inclined to both the planes. • To make the students draw the projections of the plane inclined to both the planes. • To make the students draw the projections of the various types of solids in different positions inclined to one of the planes. • To represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.
II	I	Managerial Economics and Financial Analysis	<ul style="list-style-type: none"> • Understand the market dynamics namely, demand and supply, demand forecasting, elasticity of demand and supply, pricing methods and pricing in different market structures. • Gain an insight into how production function is carried out to achieve least cost combination of inputs and cost analysis. • Develop an understanding of • Analyse how capital budgeting decisions are carried out. • Understanding the framework for both manual and computerised accounting process • Know how to analyse and interpret the financial statements through ratio analysis.
II	I	Object Oriented	<ul style="list-style-type: none"> • Students can gain knowledge about basics on OOPS

		Programming through C++	<p>principles and evaluation of OOPS</p> <ul style="list-style-type: none"> • Students can able to develop programs using control structures and overloading and programs on recursion • Students can acquire knowledge on classes, objects and members. • An ability to develop programs on operator overloading constructors, destructors • An ability to develop programs on inheritance and virtual functions. • Student can learn files and its operations, types of templates and exceptional handling mechanisms.
II	I	Mathematical Foundations of Computer Science	<ul style="list-style-type: none"> • Ability to illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations. • Ability to demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology. • Ability to represent and Apply theory in solving computer science problems
II	I	Digital Logic Design	<ul style="list-style-type: none"> • After this course student could able to design, understand the number systems, combinational sequential circuits. And they should be in a position to continue with computer organization.
II	I	Data Structures	<ul style="list-style-type: none"> • Learn how to use data structure concepts for realistic problems. • Ability to identify appropriate data structure for solving computing problems in respective language. • Ability to solve problems independently and think critically

II	II	<p align="center">Probability and statistics</p>	<ul style="list-style-type: none"> •Students would be able to identify distribution in certain realistic situation. It is mainly useful for circuits as well as non-circuit branches of engineering. Also able to differentiate among many random variable involved in the probability models. It is quite useful for all branches of engineering. •The student would be able to calculate mean and proportions (small and large sample) and to make important decisions from few samples which are taken out of unmanagably huge populations. It is Mainly useful for non-circuit branches of engineering. •The students would be able to find the expected queue length, the ideal time, the traffic intensity and the waiting time. These are very useful tools in many engineering and data management problems in industry. It is useful for all branches of engineering. •The student would able to understand about the random process, Markov process and Markov chains which are essentially models of many time dependent processes such as signals in communications, time series analysis, queuing systems. The student would be able to find the limiting probabilities and the probabilities in nth state. It is quite useful for all branches of engineering.
		<p align="center">Java Programming</p>	<ul style="list-style-type: none"> •Students can learn object oriented concepts, java program structure and its installation. •Student gain knowledge on Java programming constructs. •To implement Object oriented constructs such as various class hierarchies, interfaces and exception handling •To understand the concepts of threads and I/O in Java. •Being able to build dynamic user interfaces using

			<p>applets and Event handling in java</p> <ul style="list-style-type: none"> • To understand various components of Java AWT and Swing and writing code snippets using them
		<p>Advanced Data Structures</p>	<ul style="list-style-type: none"> • Gives a view of computer system from user's perspective, representation of data. • To understand RTL, Micro operations, ALU, Organization of stored program computer, types of instructions and design of basic components of the system. • To illustrate data paths and control flow for sequencing in CPU's, Microprogramming of control unit of CPU. • To illustrate of algorithms for basic arithmetic operations using binary and decimal representation. • To describe different parameters of a memory system, organization and mapping of various types of memories • To describe the means of interaction devices with CPU, their characteristics, modes and introduction multiprocessors
		<p>Computer Organization</p>	<ul style="list-style-type: none"> • Gives a view of computer system from user's perspective, representation of data. • To understand RTL, Micro operations, ALU, Organization of stored program computer, types of instructions and design of basic components of the system. • To illustrate data paths and control flow for sequencing in CPU's, Microprogramming of control unit of CPU. • To illustrate of algorithms for basic arithmetic operations using binary and decimal representation. • To describe different parameters of a memory system, organization and mapping of various types of memories • To describe the means of interaction devices with

			CPU, their characteristics, modes and introduction multiprocessors
		Language Processors	<ul style="list-style-type: none"> •To introduce the major concept areas of language translation and compiler design •To develop an awareness of the function and complexity of compilers. •To provide practical, hands on experience in compiler design •Identify the similarities and differences among various parsing techniques and grammar transformation techniques
III/IV R13	I	Software Engineering	<ul style="list-style-type: none"> •knowledge of basic SW engineering methods and practices, and their appropriate application; •general understanding of software process models such as the waterfall and evolutionary models. •understanding of the role of project management including planning, scheduling, risk management, etc. •understanding of software requirements and the SRS document. •understanding of different software architectural styles. •understanding of implementation issues such as modularity and coding standards. •understanding of approaches to verification and validation including static analysis, and reviews. •understanding of software testing approaches such as unit testing and integration testing. •understanding of software evolution and related issues such as version management. •understanding on quality control and how to ensure good quality software. •understanding of some ethical and professional issues that are important for software engineers.

			<ul style="list-style-type: none"> •development of significant teamwork and project based experience
		<p style="text-align: center;">Data Communication</p>	<ul style="list-style-type: none"> •Knowledge of working of basic communication systems •Ability to evaluate alternative models of communication system design
		<p style="text-align: center;">Advanced JAVA</p>	<ul style="list-style-type: none"> •Construct a Web Application using Servlets •Construct a Web application using Java Server Pages •Construct an enterprise application using Session Beans •Construct an enterprise application using Entity Beans linked with Database •Construct an asynchronous enterprise application using Message-Driven Beans •Map java inheritance hierarchy with database tables using various mapping techniques. •Persist different types of collections.
		<p style="text-align: center;">Database Management Systems</p>	<ul style="list-style-type: none"> •define a Database Management System •give a description of the Database Management structure •understand the applications of Databases •know the advantages and disadvantages of the different models •compare relational model with the Structured Query Language (SQL) •Know the constraints and controversies associated with relational database model. •know the rules guiding transaction ACID •understand the concept of data planning and Database design •identify the various functions of Database Administrator

		Operating Systems	<ul style="list-style-type: none"> •describe the general architecture of computers •describe, contrast and compare differing structures for operating Systems •understand and analyse theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files
		IPR And Patents- 1	<ul style="list-style-type: none"> • Identify different types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create and to extract value from IP. • Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development. • Identify activities and constitute IP infringements and the remedies available to the IP owner and describe the precautions steps to be taken to prevent infringement of proprietary rights in products and technology development. • Be familiar with the processes of Intellectual Property Management (IPM) and various approaches for IPM and conducting IP and IPM auditing and explain how IP can be managed as a strategic resource and suggest IPM strategy. • Be able to anticipate and subject to critical analysis arguments relating to the development and reform of intellectual property right institutions and their likely impact on creativity and innovation. • Be able to demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing;
III	II	Computer Networks	<ul style="list-style-type: none"> • Independently understand basic computer

			<p>network technology.</p> <ul style="list-style-type: none"> • Identify the different types of network topologies and protocols. • Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
		<p>Data Ware housing and Mining</p>	<ul style="list-style-type: none"> • understand why there is a need for data warehouse in addition to traditional operational database systems; • identify components in typical data warehouse architectures; • design a data warehouse and understand the process required to construct one; • understand why there is a need for data mining and in what ways it is different from traditional statistical techniques; • understand the details of different algorithms made available by popular commercial data mining software; • solve real data mining problems by using the right tools to find interesting patterns
		<p>Design and Analysis of Algorithms</p>	<ul style="list-style-type: none"> • Analyze worst-case running times of algorithms using asymptotic analysis. • Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. • Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. • Describe the greedy paradigm and explain when an algorithmic design situation calls for it. • Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate. Synthesize new graph

			<p>algorithms and algorithms that employ graph computations as key components, and analyze them.</p> <ul style="list-style-type: none"> • Explain the different ways to analyze randomized algorithms (expected running time, probability of error). Recite algorithms that employ randomization. Explain the difference between a randomized algorithm and an algorithm with probabilistic inputs. • Analyze randomized algorithms. Employ indicator random variables and linearity of expectation to perform the analyses. Recite analyses of algorithms that employ this method of analysis.
		<p style="text-align: center;">Software Testing</p>	<ul style="list-style-type: none"> • Have an ability to apply software testing knowledge and engineering methods. • Have an ability to design and conduct a software test process for a software testing project. • Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation. • Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods. • Have an ability to use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects. • Have basic understanding and knowledge of contemporary issues in software testing, such as component based software testing problems • Have an ability to use software testing methods and modern software testing tools for their testing projects.

		<p style="text-align: center;">Web Technologies</p>	<ul style="list-style-type: none"> • Analyze a web page and identify its elements and attributes. • Create web pages using XHTML and Cascading Styles sheets. • Build dynamic web pages. • Build web applications using PHP. • Programming through PERL and Ruby • write simple client-side scripts using AJAX
		<p style="text-align: center;">Intellectual Property Rights and Patents - II</p>	<ul style="list-style-type: none"> • Identify different types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create and to extract value from IP. • Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development. • Identify activities and constitute IP infringements and the remedies available to the IP owner and describe the precautions steps to be taken to prevent infringement of proprietary rights in products and technology development. • Be familiar with the processes of Intellectual Property Management (IPM) and various approaches for IPM and conducting IP and IPM auditing and explain how IP can be managed as a strategic resource and suggest IPM strategy. • Be able to anticipate and subject to critical analysis arguments relating to the development and reform of intellectual property right institutions and their likely impact on creativity and innovation. • Be able to demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and

			product marketing
IV	I	Cryptography and Network Security	<ul style="list-style-type: none"> • Identify the security issues in the network and resolve it. • Analyse the vulnerabilities in any computing system and hence be able to design a security solution. • Evaluate security mechanisms using rigorous approaches by key ciphers and Hash functions. • Demonstrate various network security applications, IPSec, Firewall, IDS, Web Security, Email Security and Malicious software etc.,
		Design Patterns	<ul style="list-style-type: none"> • Learn fundamental concepts of design patterns • Identify and apply the appropriate design pattern to solve real-time problems • Know how to format a document using document editor. • Label out the solutions to design problems using creational, structural and behavioral patterns. • Choose different creational, structural and behavioral patterns to solve design problems. 6. Categorize creational, structural and behavioral patterns.
		Data Ware Housing and Data Mining	<ul style="list-style-type: none"> • Identify the key processes of data mining, data warehousing and knowledge discovery process. • Understand the basic principles and algorithms used in practical data mining and their strengths and weaknesses. • Apply data mining techniques to solve problems in other disciplines in a mathematical way.
		Mobile Computing	<ul style="list-style-type: none"> • To make students understand the concept of mobile computing paradigm, its novel applications and limitations.

			<ul style="list-style-type: none"> • To provide the typical mobile networking infrastructure knowledge through a popular GSM architecture • To furnish the knowledge of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer • To Provide the concepts of platforms and protocols used in broadcasting and synchronization in the mobile environment
		Open Source Software	<ul style="list-style-type: none"> • Implement various applications using build systems • Understand the installation of various packages in open source operating systems • Create simple GUI applications using Gambas • Understand various version control systems • Understand the kernel configuration and virtual environment
		Distributed Systems	<ul style="list-style-type: none"> • Understand the concepts and issues related to distributed systems. • Design and develop the programs for distributed environment. • Manage performance, reliability and other issues while designing in distributed environment.
		UML & Design Patterns Lab	<ul style="list-style-type: none"> • Understand the Case studies and design the Model.. • Understand how design patterns solve design problems. • Develop design solutions using creational patterns. • Construct design solutions by using structural and behavioural patterns
		Mobile Application Development Lab	<ul style="list-style-type: none"> • Apply essential Android Programming

			<p>concepts.</p> <ul style="list-style-type: none"> • Develop various Android applications related to layouts & rich uses interactive interfaces • Develop Android applications related to mobile related server-less database like SQLITE
IV	II	HUMAN COMPUTER INTERACTION	<ul style="list-style-type: none"> • Identify good and poor design • Evaluate and design usable and appropriate software • Perform a variety of design and evaluation methods used in interaction design • Identify needs and establish requirements in their project • Apply iterative design in their project • Perform usability testing
		MULTIMEDIA & APPLICATION DEVELOPMENT	<ul style="list-style-type: none"> • Developed understanding of technical aspect of Multimedia Systems. • Understand various file formats for audio, video and text media • Develop various Multimedia Systems applicable in real time. • Design interactive multimedia software. • Apply various networking protocols for multimedia applications. • To evaluate multimedia application for its optimum performance.
		E- Commerce	<ul style="list-style-type: none"> • Understand the basic concepts and technologies used in the field of management information systems; • Have the knowledge of the different types of management information systems; • Understand the processes of developing and implementing information systems;

			<ul style="list-style-type: none"> • Be aware of the ethical, social, and security issues of information systems;
		<p style="text-align: center;">Software Project Management</p>	<ul style="list-style-type: none"> • Analyse the issues and challenges faced while managing the software project, various estimation techniques. • Evaluate the defect removal efficiency for achieving high quality software. • Understand the concepts of project scheduling, tracking, Risk analysis, Quality management and Project estimation using different techniques. • Identify project goals, constraints, deliverables, performance criteria, control needs and resource requirements in consultation with stakeholders. • Determine the trends and techniques involved in software project management.

Masters of Business Administration

YEAR	SEMESTER	SUBJECT	COURSE OUTCOMES:
I	I	MANAGEMENT THEORY AND ORGANISATION AL BEHAVIOUR	<ul style="list-style-type: none"> • student has learned about Evolution of Management thought Scientific management, administrative, management, Hawthorne experiments systems approach Levels of Management Managerial Skills • student has gained knowledge on Principles of organizing ,Organization Structure and Design ,Types of power , Delegation of Authority and factors affecting delegation , Span of control , Decentralization , Line and staff structure conflicts • obtained knowledge on Organizational behavior: Nature and scope , Linkages with other social sciences ,Individual roles and organizational goals , perspectives of human behavior , Perception, perceptual process • student has learned about Content and process Theories of Motivation , Leadership - Styles , Approaches ,Challenges of leaders in globalized era , Groups ,stages formation of groups , Group Dynamics • student has learned about Organizational conflict-causes and consequences-conflict and Negotiation Team Building, Conflict Resolution • in Groups and problem solving

			Techniques
I	I	MANAGERIAL ECONOMICS	<ul style="list-style-type: none"> • know the economy and its principles. • understand the relationship between the demand supply • Learn the types of production and its factors. • To understand the cost concepts, relationship between cost, volume and profit • To know the market structure and pricing theories.
I	I	ACCOUNTING FOR MANAGERS	<ul style="list-style-type: none"> • Acquaint the knowledge about accounting process • focus on analysis of Financial Statements • gain knowledge about Inventory issue methods • obtain knowledge about Management accounting applications • Focus on standard costing tools & Break Even Analysis
I	I	MANAGERIAL COMMUNICAAT ION AND SOFT SKILLS	<ul style="list-style-type: none"> • uptained knowledge of objectives of communication • Acquaint the knowledge interpersonal and intrapersonal communication theories • Obtain the knowledge etiquettes of interview
I	I	BUSINESS ENVIRONMENT	<ul style="list-style-type: none"> • equipped with business correspondence letters • uptained knowledge of interview techniques for group discussion • Obtained knowledge on contract and its essentials

			<ul style="list-style-type: none"> • understand consumer rights and grievances • gain knowledge about negotiable instruments • Obtained knowledge on partnership firms • understand the company formation and winding up
I	I	QUANTITATIVE TECHNIQUES AND BUSINESS DECISIONS	<ul style="list-style-type: none"> • the concepts of basic mathematical and statistical techniques are learned which are used in business studies • equipped with statistical decision theory applied in business studies • knowledge on analysing linear programming problems are learned • understand the concepts of assignment & transportation models • the techniques of networking models are learned
I	II	FINANCIAL MANAGEMENT	<ul style="list-style-type: none"> • gain knowledge about concepts of financial management • obtain knowledge about Capital structure theories • understand the Investment decision process & its tools • understand the theories of Dividend • acquaint knowledge of Working Capital Cycle.

I	II	<p style="text-align: center;">HUMAN RESOURCE MANAGEMENT</p>	<ul style="list-style-type: none"> • understand the base concept of HRM and its significance in the organisation • understand the investment perspectives of HRM(Training and Development) • understand the concepts of Performance Appraisal: Importance – Methods – Traditional and Modern methods Latest trends in performance appraisal • Enhanced knowledge and skills to Wage Structure- Wage and Salary Policies • Gain the knowledge on Employee Participation Schemes, Grievances and disputes resolution mechanism
I	II	<p style="text-align: center;">MARKETING MANAGEMENT</p>	<ul style="list-style-type: none"> • Understand the concepts of marketing. • Gain the knowledge on market segmentation. • Understand the concepts of pricing and price changes • Gain the knowledge on promotion activities. • Evolution of marketing department.
I	II	<p style="text-align: center;">PRODUCTION AND OPERATIONS MANAGEMENT</p>	<ul style="list-style-type: none"> • Gain knowledge on Operations Management & its scope • acquaint knowledge on Product Process & Design • gain the knowledge on Forecasting & Capacity Planning • Understand the Productivity & influencing factors • Gain the knowledge on Quality management

I	II	<p style="text-align: center;">BUSINESS RESEARCH METHODOLOGY</p>	<ul style="list-style-type: none"> • enhanced knowledge and skills to carry out research for business • better awareness on data collection techniques, measurement and scaling • gained knowledge in preparation and presentation of research report • equipped student with statistical techniques • students were in a position to use multivariate techniques
I	II	<p style="text-align: center;">BUSINESS ETHICS AND CORPORATE GOVERNANCE</p>	<ul style="list-style-type: none"> • Able to understand the values, ethics and ethical decision making. • Acquaint the knowledge on unethical practices among Indian companies and studies on ethical attitude of managers major Indian scam. • Gain knowledge about product advertising ,marketing ethics sales and ethical issues in banks and insurance sector. • Students are able to learn an overview of corporate Governance Indian scenario. • Understand the duties and responsibilities of auditors and role of media
II	I	<p style="text-align: center;">STRATEGIC MANAGEMENT</p>	<ul style="list-style-type: none"> • Gained knowledge about Vision, Mission and Objectives of the Organisation • Obtained knowledge of strengths, weakness, opportunities and threats of the Organisation • Gained knowledge about framing of Strategy at Various levels • Obtained knowledge about Structures of organisation and its impact on Strategy

			<ul style="list-style-type: none"> • Obtained knowledge of Evaluation of strategy and its control
II	I	LEGAL ASPECTS OF BUSINESS	<ul style="list-style-type: none"> • Obtained knowledge on contract and its essentials • understand consumer rights and grievances • gain knowledge about negotiable instruments • Obtained knowledge on partnership firms • understand the company formation and winding up
II	I	RETAIL MANAGEMENT	<ul style="list-style-type: none"> • Familiar with types and functions of retailers and their characteristics • Able to focus on competitive advantage and growth strategies. • Acquaint knowledge on retail location and performance objectives. • Able to design store layout and develop assortment plan • Able to understand brand strategy and promotional strategy .
II	I	COMPENSATION AND PERFORMANCE MANAGEMENT	<ul style="list-style-type: none"> • To understand the concept of compensation system and how to manage the compensation policy and new trends in compensation management at national and international level. • To study the concept of wage and its theories knowing the wage incentives in India and welfare measures. • to study the concept of wage and salary administration and various acts relating to wages.

			<ul style="list-style-type: none"> • Acquaint knowledge about the importance of performance management and various techniques of performance management. • Gain knowledge on appraisal system and counselling objectives and principles.
II	I	MANAGEMENT OF INDUSTRIAL RELATIONS	<ul style="list-style-type: none"> • The learner will Gain Knowledge on Industrial Relations Management • The learner able to Obtain the knowledge on Trade Unions in India-trade Unions Act , 1926 and Legal framework • The learner will Gain knowledge on Quality of Work Life and Wage and Salary administration • Understand the Social Security in Indiaand types of welfare measures provided in india • Acquaint the knowledge on Employee Grievances and Prevention and Settlement of industrial disputes in India.
II	I	INVESTMENT MANAGEMENT	<ul style="list-style-type: none"> • To know about investment, speculations and basics of primary and secondary markets • Will get to know about the types of shares and bonds, valuation of bonds , shares and bonds pricing theory • To know about the technical analysis and fundamental analysis , market research • Will get awareness on elements, composition of portfolio and management of portfolio • Obtained the knowledge on evaluation of performance of portfolio

II	I	BANKING AND INSURANCE MANAGEMENT	<ul style="list-style-type: none"> • Gain knowledge on Banking & Indian Financial System • Obtain knowledge on uses of bank funds & Non- Performing Assets • Acquaint concepts of Banking Innovations • Equipped the knowledge on Insurance in India • Gain knowledge on Life & General Insurance in India
II	II	LOGISTICS AND SUPPLY CHAIN MANAGEMENT	<ul style="list-style-type: none"> • Acquaint concepts of - Models in Logistics Management - Logistics to Supply Chain Management • Obtained knowledge on Impact of Logistics on shareholder value - customer profitability analysis – • Obtained knowledge on Benchmarking the logistics process and SCM operations –Mapping the supply chain process • Acquaint concepts of sourcing decisions and transportation in supply chain – infrastructure suppliers of transport services • Acquaint concepts of Global strategy – Global purchasing – Global logistics
II	II	ENTREPRENEURSHIP DEVELOPMENT	<ul style="list-style-type: none"> • Obtained the knowledge of Entrepreneurship • Able to learn about Training for Entrepreneurs • Gained knowledge of Planning and Evaluation of Projects

			<ul style="list-style-type: none"> • Provide awareness of Corporate • Obtained the knowledge of Institutional support to Entrepreneurs and MSME's
II	II	GLOBAL HUMAN RESOURCE MANAGEMENT	<ul style="list-style-type: none"> • Able to understand the -Challenges of Globalization - Implications of Managing People and Leveraging Human Resource International Labour relations • Able to learn about Selection methods – Positioning Expatriate – Repatriate • provide awareness about Concepts and issues – theories- considerations - Problems – Skill building methods • students got to know about the Compensation Management: Importance – Concepts- Trends - Issues – Methods – Factors of Consideration – Models – incentive methods • understand the importance of Globalization and Quality of Working Life and Productivity – Challenges in Creation of New Jobs through Globalization
II	II	MANAGEMENT OF CHANGE AND DEVELOPMENT	<ul style="list-style-type: none"> • gain the knowledge on importance of change management • obtain the knowledge on mapping change • able to learn about OD interventions • provide awareness about negotiated change • understand the importance of team building

<p style="text-align: center;">II</p>	<p style="text-align: center;">II</p>	<p style="text-align: center;">INTERNATIONAL FINANCIAL MANAGEMENT</p>	<ul style="list-style-type: none"> • Able to understand the global financial management and its scope in organisations • Able to understand management of exchange and interest rate exposure • Able to understand management of global operations and practices • Able to understand the International investment decision with respect to contemporary issues • Students obtained the knowledge of Global indebtedness
<p style="text-align: center;">II</p>	<p style="text-align: center;">II</p>	<p style="text-align: center;">FINANCIAL RISK MANAGEMENT</p>	<ul style="list-style-type: none"> • Student has learned about the basics of risk management, different types of risks, comprehensive view of risk in financial institutions • Student has gained knowledge on Value of Risk, Cash flow risk , asset liability management • student has learned about derivatives basics, types of derivatives , different players in stock market • learner has understood about SWAPS meaning , types, pricing rates of swaps • student has learned about the Options , binomial option pricing model

Integrated Masters in Business Administration

YEAR	SEMESTER	SUBJECT	COURSE OUTCOMES
I	I	ENGLISH-I	<ul style="list-style-type: none"> To make the students understand humour and the contributions of Mokshagundam to build modern india, The students also develop their LSRW skills. To make the students aware of Polymer currency and inspire them with the unique journey of Helen Keller. To make the students aware of Man-made disasters and how to prevent and prepare for them. They learn about the South Indian small town life through R.K. Narayan's work The students gain awareness about human values and ethics which contain the core values of our education policy and also experience the pathos in the story The Last Leaf. Students learn about the importance of sports and how they can improve their health and also the motivating speech from technocrat Narayanamurthy of Infosys.
I	I	PRINCIPLES OF MANAGEMENT	<ul style="list-style-type: none"> Interpret basic concept and theories of management Outline plan and different organizational structures Classify different leadership style in cross culture environment Develop rationale decision making and problem solving abilities. Core contemporary issues' and approaches to management

I	I	FUNDAMENTALS OF BUSINESS ORGANIZATION	<ul style="list-style-type: none"> • To understand the concepts of business • To know the responsibilities , source of finance for an entrepreneur • To understand various types of business • To find out the difference between public and private companies. • To know how to commence the business.
I	I	FUNDAMENTALS OF ACCOUNTING-I	<ul style="list-style-type: none"> • students has understood about basics of accounting • students has got awareness on basics of the journal and the trail balance • Able to know about basic of ledger posting • students has understood about the final accounts and income statement • students has got awareness on basis of ratio analysis and different types of ratios
I	I	BASICS OF MARKETING -I	<ul style="list-style-type: none"> • Determine the Concept of Market and Marketing and Marketing Mix • Outline the essentials of Market Segmentation and Targeting and positioning • Correlate the drivers of pricing strategy • Determine the communication process and communication mix elements • Focus on Marketing Organization and different Control strategies
I	I	MS OFFICE	<ul style="list-style-type: none"> • Able to know about basics of computer • To understand the Ms word applications • To gain knowledge in excel formulas • Able to understand the slide preparations • To gain knowledge on Ms-Office

I	II	ENGLISH-II	<ul style="list-style-type: none"> • The students learn about the definition, types and benefits of Communication • They gain awareness about Time Management and Business Etiquettes • They gain Knowledge of decision making and leadership skills • They understand thinking about logical, lateral and positive thinking askills. • Honesty, Positive attitude, Courtesy and other soft skills are learnt by the students.
I	II	BUSINESS ENVIRONMENT	<ul style="list-style-type: none"> • To know the factors influencing the business environment • To understand economic systems and economic reforms • To learn fiscal policy and balance of payments. • To know the challenges and mechanisms of India trade policy • To understand the legal frame work of Indian economic system.
I	II	ENVIRONMENTAL MANAGEMENT	<ul style="list-style-type: none"> • The natural resources and their importance for the sustenance of the life and recognize the need to Conserve the natural resources • The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web • The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity • Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices

			<ul style="list-style-type: none"> • Social issues both rural and urban environment and the possible means to combat the challenges
I	II	CUSTOMER RELATIONS HIP MANAGEMENT	<ul style="list-style-type: none"> • Able to gain knowledge on determinants of consumer behaviour and characteristics of Indian consumer • Acquaint knowledge about perception and motivational theories • Able to understand the consumer attitude and changing behaviour • Gain knowledge on how a consumer selects an alternative. • Understand the importance of CRM and to implement customer retention strategy.
I	II	BUSINESS STATISTICS	<ul style="list-style-type: none"> • Acquire knowledge on basic statistical concepts and data collection methods • Able to draw graphical presentation of data and learn the concept of central tendency and dispersion • To gain knowledge on correlation and regression analysis. • To understand the concepts of statistical hypothesis and testing • to gain knowledge on time series analysis
I	II	BUSINESS COMMUNICATION	<ul style="list-style-type: none"> • To understand basics of Objective of Communication – The Process of Human Communication • To understand basics of techniques of presentation – types of presentation – • To understand the basic– Models for Inter Personal Communication – Exchange Theory • students able to know about the – Barriers of

			<p>Communication –</p> <p>Gateways to Effective Interpersonal Communication.</p> <ul style="list-style-type: none"> • students able to know about the Essentials of Effective Business Correspondence, Business Letter and Forms, Meeting, Telephone Communication
II	I	MANAGERIAL ECONOMICS	<ul style="list-style-type: none"> • To know the economy and its principles. • To understand the relationship between the demand supply • To learn the types of production and its factors. • To understand the cost concepts, relationship between cost, volume and profit • To know the market structure and pricing practices.
II	I	FINANCIAL ACCOUNTING G-II	<ul style="list-style-type: none"> • To understand basics of accounting • To know the accounting forms for Inventory management • Able to know the basic awareness on cash flow and funds flow statements • able to get basic awareness on accounting standards • Co5:Able to know the various aspects of financial reporting
II	I	BUSINESS MATHEMATICS	<ul style="list-style-type: none"> • To acquire knowledge on mathematical concepts matrix and determinants • Able to learn about the geometry concepts • Able to learn the differentiation • To understand the applications of differentiation • obtain knowledge on integration and its application

II	I	<p align="center">BUSINESS LAW</p>	<ul style="list-style-type: none"> • Describe three different relationships that could be created the law of agency • Explain about sale of goods act • Distinguish forms of business organisations • compare consumer protection act 1986 and contract of agency • research negotiable instruments act 1881
II	I	<p align="center">FUNDAMENTALS OF HUMAN RESOURCE MANAGEMENT</p>	<ul style="list-style-type: none"> • understand the base concept of HRM and its significance in the organisation • understand the investment perspectives of HRM(Training and Development) • understand the concepts of Performance Appraisal: Importance – Methods – Traditional and Modern methods – Latest trends in performance appraisal • Enhanced knowledge and skills to Wage Structure- Wage and Salary Policies • Gain the knowledge on Employee Participation Schemes, Grievances and disputes resolution mechanism
II	II	<p align="center">COMPANY LAW</p>	<ul style="list-style-type: none"> • Gain knowledge of the environment about in and around of company act. • Able to understand the procedure of incorporation of a company • will understand concepts, rules or procedures of Company Prospects • The learner will understand the procedure or rules of directors appointments , qualifications, and other aspects • the learner can interpret the procedure in winding up of a company

II	II	<p style="text-align: center;">ELEMENTS OF DIRECT AND INDIRECT TAX</p>	<ul style="list-style-type: none"> • Able to Know about the basics of tax system and have awareness on Income Tax Act 1961 • Students have awareness on assessment of tax of income from salaried, income from individuals and income from HP • Can analyse the tax on income from business and profession problems arising from aggregation of income and set off and carry forward loss. • obtained the knowledge on Indirect tax laws, administration and relevant procedure, the central exercise including central value added tax and central sales tax • Able to know about Tax administration appeals, revisions, review, rectification and application to control board of direct taxes. Acquisition proceedings principals of valuation movable and immovable property.
II	II	<p style="text-align: center;">ELEMENTS OF FINANCIAL MANAGEMENT</p>	<ul style="list-style-type: none"> • gain knowledge about concepts of financial management • obtain knowledge about Capital structure theories • understand the Investment decision process & its tools • understand the theories of Dividend • Acquaint knowledge of Working Capital Cycle.
II	II	<p style="text-align: center;">BUSINESS ETHICS</p>	<ul style="list-style-type: none"> • Obtained Knowledge of Nature of Ethics, Business Ethics and its theories • Obtained knowledge of Different Ethical attitudes • Gained Knowledge of Ethics in HRM, Marketing, Finance etc • Obtained knowledge of Corporate Governance

			<ul style="list-style-type: none"> • Gained Knowledge of Ethics and Social Responsibilities
II	II	ORGANISATIONAL BEHAVIOUR	<ul style="list-style-type: none"> • To understand the basic approach of organisation behaviour • To understand the ways of personality development • To understand the decision making system and importance in organisation • To understand the interpersonal communication system within the organisation • To understand the organisation development (goals, objectives and process)

Master of Computer Application

YEAR	SEMESTER	SUBJECT	Course Outcomes
I	I (R13)	C PROGRAMMIN G AND DATA STRUCTURES	<ul style="list-style-type: none"> ▪ Design algorithmic solutions for given problems ▪ Analyze problems and construct C Programs that solve it ▪ Design and Implement Modular Programming and memory management using pointers ▪ Choose the appropriate data structure and algorithm design method for a specified application ▪ Apply and Implement learned algorithm design techniques and data structures to solve problems.
		DIGITAL LOGIC AND COMPUTER ORGANIZATIO N	<ul style="list-style-type: none"> • Understand the internal functioning of CPU that includes analyzing performance of computer system using performance equations • Make use of the binary number system and apply knowledge of mathematics to perform basic arithmetic operations performed by the processor for compilation • To develop independent learning skills and to learn more about different computer architecture and hardware using modern tools.
		DISCRETE MATHEMATIC AL STRUCTURES & GRAPH THEORY	<ul style="list-style-type: none"> • Validate statements using propositional logic and convert them to normal form • Perform operations on various discrete structures such as sets, functions, relations, and sequences • Apply basic counting principles, Ability to solve problems on Recursion and generating functions • Perform different operations on graphs and trees. And learn different properties of them • Apply algorithms and use of graphs and trees as tools to visualize and simplify problems
		PROBABILITY	<ul style="list-style-type: none"> • Predict various Probabilistic situations based on

		AND STATISTICAL APPLICATIONS	<p>various laws of probability.</p> <ul style="list-style-type: none"> • Distinguish among the criteria of selection and application of Binomial, Poisson, Normal and Gamma distributions • Estimate the point and Interval estimations of mean, variance and proportion for the given sample data • Apply various sample tests like Z-test, F-Test and χ^2 for decision making regarding the population based on sample data
		ACCOUNTING AND FINANCIAL MANAGEMENT	<ul style="list-style-type: none"> • Understand the balance sheet preparation and perform analysis. • Understand the budget preparation and control of a company. • Decide about the state of affairs of a particular firm / company. • Ensure the preparation of fiscal policies of the organization. • Ensure the factors to be considered in investment policies
I	II (R13)	OOPS THROUGH JAVA	<ul style="list-style-type: none"> ▪ Test a software application written in the Java programming language. ▪ Create a software application using the Java programming language • Debug a software application written in the Java programming language
		OPERATING SYSTEMS	<ul style="list-style-type: none"> ▪ Familiarize with the concepts of the operating system. ▪ Gain knowledge about the fundamental concepts and algorithms used in existing commercial operating system. • Knowledge on various process scheduling algorithms and IPC

		<p>ORGANIZATIONAL STRUCTURES AND HUMAN RESOURCE MANAGEMENT</p>	<ul style="list-style-type: none"> • Tackle the business situations effectively • Gain the practical implication of Theories and principles of management • Understand about the Organization structure and hierarchy of the organization • Handle the organization problems with excellence
		<p>OPTIMIZATION TECHNIQUES</p>	<ul style="list-style-type: none"> ▪ Formulate optimization problems; ▪ Understand and apply the concept of optimality criteria for various type of optimization problems; ▪ Solve various constrained and unconstrained problems in single variable as well as multivariable; • Apply the methods of optimization in real life situation.
		<p>BUSINESS DATA PROCESSING</p>	<ul style="list-style-type: none"> • Define knowledge discovery and data mining • Recognize the key areas and issues in data mining • Apply the techniques of clustering, classification, association finding, feature selection and visualization to real world data • Determine whether a real world problem has a data mining solution • Apply evaluation metrics to select data mining techniques
		<p>DATABASE MANAGEMENT</p>	<ul style="list-style-type: none"> • Understand, appreciate and effectively explain the underlying concepts of database technologies • Design and implement a database schema for a given problem-domain • Normalize a database • Populate and query a database using sql DML/DDDL commands • Declare and enforce integrity constraints on a database using state –of-the-art RDBMS

			<ul style="list-style-type: none"> • Programming PL/SQL including stored procedures, stored functions, cursors, packages. • Design and build a GUI application using 4GL
		COMPUTER COMMUNICATION	<ul style="list-style-type: none"> • To master the terminology and concepts of the OSI reference model and the TCP-IP reference model. • To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks. • To be familiar with wireless networking concepts • To be familiar with contemporary issues in networking technologies. • To be familiar with network tools and network programming.
		UNIX PROGRAMMING	<ul style="list-style-type: none"> • Work confidently in Unix/Linux environment • Write shell scripts to automate various tasks • Master the basics of Linux administration • To know in detail concepts of operating system
		MANAGEMENT INFORMATION SYSTEM	<ul style="list-style-type: none"> • Understand basic concepts and technologies used in the field of management information systems • Have the knowledge of the different types of management information system • Understand the process of developing and implementing information systems • Be aware of the ethical, social and security issues and information systems • Learn about the importance of managing organizational change associated with information system implementation
		DESIGN AND ANALYSIS of ALGORITHMS	<ul style="list-style-type: none"> • Analyze algorithm performance using complexity measurement. • Master major algorithm design techniques such as

			<p>Divide and conquer, Greedy and Dynamic Programming</p> <ul style="list-style-type: none"> • Apply above approaches to solve variety of practical problems such as sorting and selection, graph problems and other optimization problems such as branch and bound.
		SOFTWARE ENGINEERING	<ul style="list-style-type: none"> • Develop skills to engineer software of high quality by following sound analysis and design principles. • Learn successful project execution strategies like requirements analysis, estimation, risk management and project scheduling activities • Inculcate quality consciousness through effective software quality management
		ADVANCED JAVA & WEB TECHNOLOGIES	<ul style="list-style-type: none"> • Writing a valid HTML document involving a variety of element types, including hyperlinks, images, lists, tables and forms • Choose the best technologies of solving client/server problems • Use a variety of strategies and tools to create websites • Install a web server application • 5.) Develop a sophisticated web application that employs the MVC architecture
		DATA WAREHOUSING & MINING	<ul style="list-style-type: none"> • Design a data mart or data warehouse for any organization • Develop skills to write queries using DMQL • Extract knowledge using data mining techniques • Adapt to new data mining tools • Explore recent trends in data mining such as web mining, spatial_temporal mining
		HUMAN COMPUTER	<ul style="list-style-type: none"> • Implement Interaction design basics

		INTERACTION	<ul style="list-style-type: none"> • Use HCI in the software process • Apply Design rules
		SOFTWARE TESTING METHODOLOGIES	<ul style="list-style-type: none"> • Have an ability to apply software testing knowledge and engineering methods. • To apply the fundamental knowledge of testing real time scenarios • To test a simple application of their choice and to understand those learnt techniques in software development life cycle. • Have an ability to design and conduct a software test process for a software testing project. • Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation. • Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods. • Have an ability to use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects. • Have basic understanding and knowledge of contemporary issues in software testing, such as component-based software testing problems.
III	I (R13)	INFORMATION SECURITY	<ul style="list-style-type: none"> ▪ Ability to demonstrate the knowledge of cryptography and network security concepts and applications ▪ Apply security principles in system design • Ability to identify and investigate vulnerabilities and security threats and mechanisms to counter them.
		NETWORK	<ul style="list-style-type: none"> ▪ Understand the key protocols that support the

		PROGRAMMING	<p>Internet</p> <ul style="list-style-type: none"> ▪ Apply several common programming interfaces to network communication ▪ Understand the use of TCP/UDP Sockets • Apply advanced programming techniques such as Broadcasting, Multicasting.
		OBJECT ORIENTED ANALYSIS AND DESIGN	<ul style="list-style-type: none"> ▪ Understand Object oriented software Development Process ▪ Gain exposure to Object Oriented Methodologies &UML Diagrams • To apply Object Oriented Analysis Processes for Projects
		E-COMMERCE	<ul style="list-style-type: none"> ▪ Study of electronic data inter change and just in time approach ▪ Study about the electronic commerce and electronic transactions and impact of electronic commerce on organizations and society • Study of various security issues while doing electronic transactions
		SOFTWARE PROJECT MANAGEMENT	<ul style="list-style-type: none"> ▪ Define roles and responsibilities by PM process group ▪ Articulate the purpose and benefits of project management ▪ Written reports and oral presentations ▪ Work in groups to analyze a project and implement a solution • Apply Key PM concepts.