Key Indicator 1.1 Curriculum Design and Development

1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme Specific outcomes (PSOs) and Course Outcomes (COs) of the Programmes offered by the Institution

COMMON COURSES TO ALL UG PROGRAMMES

Name of the Course	Needs				Description
	Global	National	Regional	Local	
Matrices and Calculus			✓		Studying of fundamentals of Matrices, Properties, and Differentiations
Physics For Non Circuit Engineering		✓			Learn the basics concepts and applications of physics in Engineering
English For Engineers	✓	✓	✓	✓	Learn to communicate effectively and Build confidence and the necessary communication skills for job performance and career advancement

Chemistry For Circuit Engineering	✓	✓	✓	✓	Understand the various Engineering applications of Chemistry
Universal Human Values	✓	✓	✓	✓	Systematic set of universal, rational and verifiable proposals about the human reality – about the inherent harmony in the human being, the family, society, the entire nature and existence
Entrepreneurship & Innovation	✓	✓	✓	✓	The Innovation and Entrepreneurship Program teaches essential skills and effective strategies for leading innovation in organizations
Tamils And Technology / Indian Constitution			✓	✓	Understand the functions of the Indian government. Understand and abide the rules of the Indian constitution.
Differential Equations And Complex Analysis	✓	✓	✓	✓	Study the various solutions of differential equations and complex differentiation and integration
Differential Equations And Laplace Transform	✓	✓	✓	✓	Ability to identify the tools used in the application of Differential equations,
Differential Equations And Linear Algebra	✓	✓	✓	✓	Understand the concept of linear algebra and solutions of differential equations
Fourier Analysis And Laplace Transforms	✓	✓	✓	✓	Ability to identify the tools used in the Fourier series and transforms.
Partial Differential Equation , Fourier Series And Transforms		✓	✓	✓	Understand the Properties and its the behavior of Fourier series and transforms, classification of Partial differential equations

Environmental Studies		✓	✓	✓	Acquire knowledge about the different environmental aspects, social issues, environmental issues, and solution for the environmental issues.
Basics Of Material Science	✓	✓	✓	✓	Learn the fundamental knowledge of the various types of materials and their applications in Engineering
Applied Mechanics		✓	✓		Provides necessary tools to predict and understand the behavior of various materials and structures under different conditions.
Physics For Circuit Engineering Programme		✓	✓	✓	Learn the basics concepts and applications of physics in Engineering
Chemistry For Engineers	✓	✓	✓	✓	Understand the various Engineering applications of Chemistry
Effective Technical Communication	✓	✓	✓	✓	The rationale of the curriculum is to help students learn technical communication along with necessary moral and ethical dimensions of engineering
Soft Skills And Aptitude-1	✓	✓	✓	✓	Soft skills training equips professionals with the ability to analyze problems, think critically, and develop creative solutions.
Heritage Of Tamil			✓	✓	Provides Knowledge on geographical uniqueness of Tamil Nadu
NCC */NSS / YRC / Sports / Clubs / Society Service -Enrollment	✓	✓	✓	✓	aims to inculcate social welfare in students, and to provide service to society without bias

Applied Statistics And Queuing Theory	✓	✓	✓	✓	Understand the behaviors of testing the hypothesis and queueing models
Complex Analysis And Transforms	✓	✓	✓	✓	Understand the Properties and its the behavior of Fourier transforms, classification of Complex differentiation and integration
Discrete Mathematics And Graph Theory	✓	✓	✓	✓	Impart knowledge in proportional and predicate calculus, graph theory.
Fourier Analysis And Numerical Techniques	✓	✓	✓	✓	Understand the Properties and its the behavior of Fourier series and transforms, solution of first-order ordinary differential equations
Fourier Series And Transforms	✓	✓	✓	✓	Understand the Properties and the behavior of Fourier series and transforms
Mathematics For Machine Learning	✓	✓	✓	✓	Studying of fundamentals of mathematics
Numerical Methods	✓	✓	✓	✓	Study of process to find the solution of first-order ordinary differential equations
Statistics & Numerical Methods	✓	✓	✓	✓	Understand the behaviors of testing the hypothesis and solution of first-order ordinary differential equations
Transforms And Applications	✓	✓	✓	✓	Study the various properties and the behavior of Fourier transforms, Laplace transform and its applications
Statistics And Numerical Methods With R Program	✓	✓	✓	✓	Understand the behaviors of testing the hypothesis with R Programming

Applied Probability And Statistics For Agricultural Engineering	✓	✓	✓	✓	Study the various properties testing the hypothesis and correlation and regression
Discrete Structures And Graph Theory	✓	✓	✓	✓	Impart knowledge in proportional and predicate calculus, graph theory.
Probability And Operation Research	✓	✓	✓	✓	This course facilitates handling, standard distribution, and solution of Linear programming problem
Probability And Statistics With R Programming	✓	✓	✓	✓	Understand the behaviors of testing the hypothesis and distribution with R Programming
Applied Statistics With R Programming & Queuing Theory	✓	✓	✓	✓	Understand the behaviors of testing the hypothesis and queueing models with R Programming
Environmental Studies	✓	✓	✓	✓	Acquire knowledge about the different environmental aspects, social issues, environmental issues, and solution for the environmental issues.
Soft Skill-I	✓	✓	✓	✓	Students will have clarity on their career exploration process and to match their skills and interests with a chosen career path.
Design Thinking	✓	✓	✓	✓	Students able to Develop a strong understanding of the Design Process, learn to develop and test innovative ideas through a rapid iteration cycle, Develop teamwork and leadership skills.
Soft Skill-II	✓	✓	✓	✓	Students will have learnt to keep going according to plan, coping with the unfamiliar, managing disappointment and dealing with conflict.

Intellectual Property Rights (IPR)	✓	✓	✓	✓	To introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries aspects.

BE AERONAUTICALENGINEERING

Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Aeronautical Engineering	22AE3201	Elements of Aeronautics	✓	✓	✓	✓	To introduce the concepts of flying and history of aeronautics and to identify the different components of an aircraft
Aeronautical Engineering	22AE3202	Solid Mechanics	✓	✓	✓	✓	To introduce various behaviors of materials and analyze the structural components under various loading conditions.
Aeronautical Engineering	22AE3251	Aero Engineering Thermodynamics	✓		✓	✓	To provide in-depth study of thermodynamic principles, thermodynamics of state
Aeronautical Engineering	22AE3252	Engineering Fluid Mechanics	✓	✓		✓	To be familiar with the fluid properties and flow characteristics
Aeronautical Engineering	22AE3001	Strength of Materials Laboratory	✓	✓	✓	✓	Skill development- To introduce various behaviors of materials and analyze the structural components under various loading conditions.
Aeronautical Engineering	22AE3002	Aircraft Component	✓	✓	✓	✓	To design and draft the different aircraft components.

		Drawing Laboratory					
Aeronautical Engineering	22AE3072	Introduction to MATLAB	✓	✓	✓	✓	Experience in emerging skills to meet current industrial needs.
Aeronautical Engineering	22HE4101	IPR and Start-ups	✓	✓	✓	✓	Patents & Copyrights , WIPO & GATT, WTO and Strategies
Aeronautical Engineering	22AE4201	Aerodynamics - I	✓	✓	✓	✓	To demonstrate a fundamental understanding of fluid mechanics applicable to flight, and the forces and moments on airfoil and its conformal transformation.
Aeronautical Engineering	22AE4202	Mechanics of machines	✓	✓	✓	✓	To know different types of inversions in the mechanisms.
Aeronautical Engineering	22AE4203	Gas Turbine Propulsion	✓	✓	✓	✓	To know the fundamentals of gas turbines and its components
Aeronautical Engineering	22AE4251	Aircraft Structures-I	✓	✓	✓	✓	To familiarize with different types of beams subjected to various types of loading and support conditions.
Aeronautical Engineering	22AE3201	Aerodynamics Laboratory	✓	✓	✓	✓	To introduce the concepts of flying and history of aeronautics and to identify the different components of an aircraft
Aeronautical Engineering	22AE3202	Propulsion Laboratory	✓	✓	✓	✓	To introduce various behaviors of materials and analyze the structural components under various loading conditions.
Aeronautical Engineering	21AE5001	UAV design and Aeromodelling Laboratory	✓	✓	✓	✓	To introduce the concepts of flying and history of aeronautics and to identify the different components of an aircraft

Aeronautical Engineering	21AE5002	Aircraft Structures Laboratory -II	✓	✓	✓	✓	To introduce various behaviors of materials and analyze the structural components under various loading conditions.
Aeronautical Engineering	21AE5201	Advanced Propulsion	✓	✓	✓	✓	To provide in-depth study of thermodynamic principles, thermodynamics of state
Aeronautical Engineering	21AE5202	Aircraft Structures - II	✓	✓	✓	✓	To be familiar with the fluid properties and flow characteristics
Aeronautical Engineering	21AE5203	Flight Dynamics	✓	✓	✓	✓	To introduce various behaviors of materials and analyze the structural components under various loading conditions.
Aeronautical Engineering	21AE5204	High Speed Aerodynamics	✓	✓	✓	✓	Employability- To design and draft the different aircraft components.
Aeronautical Engineering	21AE5301	Aircraft Materials and Process	✓	✓	✓	✓	Experience in emerging skills to meet current industrial needs.
Aeronautical Engineering	21AE5302	Wind tunnel techniques	✓	✓	✓	✓	Patents & Copyrights , WIPO & GATT, WTO and Strategies
Aeronautical Engineering	21AE5303	UAV and MAV design	✓	✓	✓	✓	Skill developmentundamental understanding of fluid mechanics applicable to flight, and the forces and moments on airfoil and its conformal

							transformation.
Aeronautical Engineering	21AE5304	Non Destructive Evaluation	✓	✓	✓	✓	To know different types of inversions in the mechanisms.
Aeronautical Engineering	19AE7201	Control Engineering	✓	✓	✓	✓	To know the fundamentals of gas turbines and its components
Aeronautical Engineering	19AE7251	Aircraft Systems and General Maintenance Practices	✓	✓	✓	✓	To familiarize with different types of beams subjected to various types of loading and support conditions.
Aeronautical Engineering	19AE7001	Structural Simulation Laboratory	✓	✓	✓	✓	To study Pressure distribution around different profiles
Aeronautical Engineering	19AE7002	Aero Engine and Airframe Laboratory	✓	✓	✓	✓	Skill development- To familiarize students and to expose them practically to various aircraft piston and gas turbine engines
Aeronautical Engineering	19AE7901	Total Quality Management	✓	✓	✓	✓	To impart hands on experience in making a UAV.
Aeronautical Engineering	19AE8302	Finite Element Methods in Engineering	✓	✓	✓	✓	To enable to understand the behavior of aircraft structural components under different loading conditions
Aeronautical Engineering	19AE8901	Composite Materials and Structures	✓	✓	✓	✓	To understand various propulsion technologies associated with space launch vehicles, missiles and space probes.
Aeronautical Engineering	19AE7002	Heat Transfer	✓	✓	✓	✓	Learn the concepts and basic structural analysis of 2-D members in Cartesian and

							Polar coordinates using various methods.
Aeronautical Engineering	19AE7901	Introduction to Flight	✓	✓	✓	✓	an understanding of the basic principles of atmospheric flight mechanics and what role students play in aircraft design.
Aeronautical Engineering	19AE8302	Theory of Elasticity	✓	✓	✓	✓	To understand about the formation of normal and oblique shocks.
Aeronautical Engineering	19AE8901	Introduction to cryogenics	✓	✓	✓	✓	Study the basic concepts involved in Non destructive testing methods. Understand the principles of various types of NDT methods.
Aeronautical Engineering	19AE7201	Boundary Layer Theory	✓	✓	✓	✓	Create numerical modeling and its role in the field of fluid flow and heat transfer. Learn the various grid generating techniques. Use the various discretization methods and boundary layer equations.
Aeronautical Engineering	19AE7202	AI & IoT for aviation	✓	✓	✓	✓	Students able to understand the single degree vibrating system, solve multi-degree vibrating systems, Differentiate types of vibrations according to dampness and particle motion.
Aeronautical Engineering	19AE7251	Airframe Maintenance and Repair	✓	✓	✓	✓	Introduce the basic of avionics and its need for civil and military aircraft and to impart knowledge about the avionic architecture, various avionics data buses. Gain more knowledge on flight decks and cockpits.

BE AUTOMOBILE ENGINEERING

Coursesfocuson Global,National,RegionalandLocalNeeds							
Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Automobile Engineering	22ME1201	Engineering Drawing	✓			✓	Engineering Drawing unravels the language of engineering through precise lines and geometric forms, translating concepts into tangible designs.
Automobile Engineering	22AG3201	SOIL TECHNOLOGY					Fundamental knowledge on Soil physical parameters, Permeability – Compaction, Bearing Capacity and types and methods of soil survey and interpretative groupings.
Automobile Engineering	22AG3202	FLUID MECHANICS AND PUMPS	✓	✓	✓	✓	Able to explain the effect of fluid properties on a flow system. Able to identify type of fluid flow patterns and describe continuity equation. select and analyze an appropriate turbine with reference to given situation in power plants
Automobile Engineering	22AG3203	ENGINEERING THERMODYNAMICS	✓	✓	✓	✓	Understanding the basic concepts and applying the first, second law of thermodynamics in selected processes, Understanding the application of boilers in food processing.

Automobile Engineering	22AG3251	UNIT OPERATIONS IN AGRICULTURAL PROCESSING	✓	✓	✓	✓	Knowledge on Fundamentals of various unit operations of Agricultural Processing and material handling equipment.
Automobile Engineering	22AG3252	SURVEYING AND LEVELLING	✓	✓	✓	✓	Develop the knowledge and skills related to surveying and levelling principles and practice
Automobile Engineering	22AG3001	SOIL TECHNOLOGY LABORATORY	✓	✓	✓	✓	Know the techniques to determine various physical and chemical properties of soil that are applicable for agriculture and irrigation by conducting appropriate tests.
Automobile Engineering	22AG3072	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING	✓	✓	✓	✓	Display competence in oral, written, and visual communication. Handle Engineering Ethics and Human Values.Make effective presentations.Show an understanding of opportunities in the field of communication.Communicate ethically.
Automobile Engineering	22ME2101	Engineering Mechanics	✓	✓	✓	✓	In Mechanism and Machine Theory, the intricate dance of gears and linkages unveils the essence of mechanical motion.
Automobile Engineering	21AG5201	FARM MACHINERY AND EQUIPMENT	✓	✓	✓	✓	Gaining knowledge on usage of various equipment used in the farm for different field operations
Automobile Engineering	21AG5202	REFRIGERATION AND COLD CHAIN MANAGEMENT	✓	✓	✓	✓	Understand the various components of refrigeration system and its types, Apply the concept of low temperature storage systems for foods for its shelf life enhancement.
Automobile	21AG5203	THEORY OF	✓	✓	✓	✓	Engineering science which deals with the study of relative motion between various

Engineering		MACHINES					elements of a machine and the forces which act on them.
Automobile Engineering	21AG5251	GROUNDWATER AND WELL ENGINEERING	✓	✓	✓	✓	Skill Development- Gaining knowledge on usage of various equipment used in the farm for different field operations, groundwater exploration and recharge and Groundwater quality criteria.
Automobile Engineering	21AG5252	SOIL AND WATER CONSERVATION ENGINEERING	✓	✓	✓	✓	Designing of appropriate watershed based soil
Automobile Engineering	21AG5001	OPERATION AND MAINTENANCE OF FARM MACHINERY LABORATORY	✓	✓	✓	✓	Skill Development through deep knowledge development in farm equipment experimental works and understanding the various components of farm
Automobile Engineering	21AG5002	CAD FOR AGRICULTURAL ENGINEERING	✓	✓	✓	✓	Employability opportunity in farm and irrigation equipment manufacturing industries and marketing through design of farm equipments, drip and sprinkler design, green house construction and field layout preparation .
Automobile Engineering	21AG5301	SYSTEMS ANALYSIS AND SOFT COMPUTING IN AGRICULTURAL ENGINEERING	✓	✓	✓	✓	To introduce the students to the application of systems concept to agricultural engineering problems, planning and management, Soft computing techniques for modeling different problems in the field agricultural engineering
Automobile Engineering	21AG5302	SUSTAINABLE AGRICULTURE AND FOOD SECURITY	✓	✓	✓	✓	Employability-To study the importance of sustainable agriculture for the growing population, various resources required and

							their sustainability, Importance of science, food security and ecological balance.
Automobile Engineering	21AG5303	CDM AND CARBON TRADING TECHNOLOGY	✓	✓	✓	✓	To know the basics, importance of clean development mechanism (CDM), To know the concept of carbon trading
Automobile Engineering	21AG5304	IOT IN AGRICULTURAL SYSTEMS	✓	✓	✓	✓	Understand about e-governance and agricultural systems management.
Automobile Engineering	19AG7201	AGRICULTURAL EXTENSION	✓	✓	✓	✓	Equip the extension functionaries in latest tools and techniques for participatory decision making and develop an insight into various extension models to enrich the agri - value chain.
Automobile Engineering	19AG7202R	REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM	✓	✓	✓	✓	Understand the basic principles and compoents of Remote Sensing. Study the applications of remote sensing and GIS.
Automobile Engineering	19AG7251	PRECISION FARMING AND PROTECTED CULTIVATION	✓	✓	✓	✓	Skill development of production technology for growing agriculture crops, preparing design guidelines of protected structures for different agro climatic conditions, fertigation scheduling strategies for various crops ,soil-less/hydroponics cultivation technology.
Automobile Engineering	19AG7001R	Renewable energy laboratory	✓	✓	✓	✓	Learn different primary energy sources and renewable energy sources, Design various solar energy utilized systems, Illustrate the principles of wind, tidal and geothermal energy and its applications, Impart the

							applications of energy from waste and designing of bio gas plant, Exposure in various direct energy conversion systems
Automobile Engineering	19AG7002R	Remote sensing and gis laboratory for agricultural engineers	✓	✓	✓	✓	Appraise the characteristics and principles of remote sensing, Implement the elements of photogrammetry
Automobile Engineering	19AG7901	Innovative project	✓	✓	✓	✓	Validate the technical report and Analyze a methodology to select a project and able to develop a software project.
Automobile Engineering	19AG7301	Post-harvest technology	✓	✓	✓	✓	Employability through understanding the post harvesting operations & crop processing.
Automobile Engineering	19AG7302	Dairy process technology	✓	✓	✓	✓	Gain knowledge about Dairy technology and Understand the process of manufacturing of dairy products.
Automobile Engineering	19AG7303	Storage and packaging technology	✓	✓	✓	✓	Understanding of various methods of storage and different packaging techniques for food.
Automobile Engineering	19AG7304R	Process engineering of Fruits and vegetables	✓	✓	✓	✓	Understand the basics of Post Harvest Technology of fruits and vegetables through their structure and composition. Study the different methods of processing and preservation of fruits and vegetables including drying and dehydration.
Automobile Engineering	19AG7305	Fat and oil processing	✓	✓	✓	✓	Understand the physical and chemical properties of fats and oils, Remember the mechanical methods for oil extraction,

							Understand the solvent extraction
Automobile Engineering	19AG6401	Modern agricultural p ractices	✓	✓	✓	✓	Analyze agri business suitations, formulate strategies, implement plans and implement strategic change.
Automobile Engineering	19AU7201	Automotive Electrical and Electronics		✓	✓	✓	Demonstrate the functions of batteries and charging system and bring knowledge about the charging and lighting system.
Automobile Engineering	19AU7202	Engine and Vehicle Management Systems	✓	✓	✓		Understand the principles of the vehicle pool system, to understand the importance of vehicle checks, and to discover tips for safe vehicle management.
Automobile Engineering	19AU7251	Electric and Hybrid Vehicle	✓		✓	✓	Summarize the electric and hybrid vehicle operation and architectures and design and develop the systems of hybrid and electric vehicles.
Automobile Engineering	19AU7001R	Automotive Electrical and Electronics Lab		✓	✓	✓	Perform basic electrical testing in a vehicle and to construct electrical circuits and test its parameters by using electrical measuring instruments.
Automobile Engineering	19AU7002	Vehicle Maintenance Laboratory		✓	✓	✓	Describe the minor and major tuning of diesel and petrol engines and dismantle, study, perform corrections and assemble the vehicle systems.
Automobile Engineering	19AU7901	Project Work – Phase I	✓	✓	✓	✓	Demonstrate a sound technical knowledge of their selected project topic and to undertake problem identification, formulation and solution.

Automobile Engineering	19AU7301	Automotive Vehicle Maintenance	✓	✓	✓	✓	Apply the knowledge on maintenance tools and records and analyze the various procedures to carry out engine repair and over hauling.
Automobile Engineering	19AU7302 R	Digital Supply Chain Management	✓	✓	✓	✓	Focus on the critical aspects of building a digitally-enabled supply chain and understand how to leverage technology to improve operational efficiency and decision-making across the supply chain.
Automobile Engineering	19AU7303	Engine Auxiliary Systems	✓	✓	✓	✓	Calculate major dimensions of engine components like cylinder, piston, connecting rod, crankshaft, valve and valve operating mechanisms and to select suitable scavenging process for two stroke engines.
Automobile Engineering	19AU7304	Tribology and Terotechnology	✓	✓	✓	✓	Understand the basics of Tribology and importance in engineering field and infer about the friction and its associated effects on surfaces.
Automobile Engineering	19AU7305 R	Entrepreneurship Development	✓	✓	✓	✓	Explain the types, characteristics of entrepreneurship and its role in economic development and apply the theories of achievement motivation and the principles of entrepreneurship development program.
Automobile Engineering	19AU7306 R	Automotive Embedded Systems	✓	✓	✓	✓	To acquire fundamental knowledge of an automobile system and the functions of each system with its design and layout, and apply concepts learnt in core courses to synthesize mathematical models of the automotive systems.

Automobile Engineering	19AU8301R	Digital Vehicle Monitoring	✓	✓	✓	✓	Understand and enhanced the knowledge about circuits analysis and synthesis by applying KVL and KCL and to identify the circuit's topology to reduce complexity.
Automobile Engineering	19AU8302	Computational Fluid Dynamics	✓	✓	✓	✓	Summarize the discretization process of governing equation and rephrase the grid generation and its application.
Automobile Engineering	19AU8303	Automotive Painting Technology	✓	✓	✓	✓	Understand the basic concepts about paints, their ingredients, functions of ingredients, classification of paints and the properties of various raw materials for paints.
Automobile Engineering	19AU8304	Non-Destructive Testing and Materials	✓	✓	✓	✓	Establish procedures and differentiate various defect types and select the appropriate NDT methods for better evaluation.
Automobile Engineering	19AU8305	Motorsports Engineering	✓	✓	✓	✓	Understand the aerodynamic characteristics of the motor sporting vehicles and remember the working of various racing vehicle engines and performance tune ups.
Automobile Engineering	19AU8306 R	Automotive Cyber Security	✓	✓	✓	✓	Understand the Challenges in new quality requirements due to the increasing digitalization, interaction, and automation of vehicles.
Automobile Engineering	19AU8308	Autonomous Vehicle Technology	✓	✓	✓	✓	Acquire knowledge in autonomous vehicle importance able to analyze the autonomous concepts.
Automobile Engineering	19AU8309	Off Road Vehicles	✓	✓	✓	✓	Understand the off-road vehicles based on the need and purpose and learn about off road vehicle special equipment.

Automobile Engineering	19AU8310	Unconventional Machining Processes	✓	✓	✓	✓	Differentiate the machining processes that use different energies and identify the process parameters, their effect and applications of different processes.
Automobile Engineering	19AU8311R	Vehicle Transport Management	✓	✓	✓	✓	Identify different areas of transport management and laws and to find the applications of all the areas in day-to-day life.
Automobile Engineering	19AU8901	Project Work – Phase II	✓	✓	✓	✓	Demonstrate a sound technical knowledge of their selected project topic and to undertake problem identification, formulation and solution.
Automobile Engineering	19AU7402	Automotive Safety		✓	✓	✓	Acquire the knowledge in automotive safety and importance, analyze the safety concepts.

CIVIL ENGINEERING

CoursesfocusonGlobal,National,RegionalandLocalNeeds

Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Civil Engineering	22CE3201	Basic Building Services	✓	✓	✓	✓	The content covers essential skills for designing electrical, lighting, ventilation, fire safety, and plumbing systems in buildings, fostering employability and entrepreneurship in construction, engineering, and sustainability sectors.

Civil Engineering	22CE3202	Construction Materials and Techniques	✓	✓	✓	✓	Learn construction materials, cement, aggregates, concrete properties, techniques for substructure, superstructure, and special structures for employability.
Civil Engineering	22CE3203	Water Supply and Wastewater Engineering	✓	✓	✓	✓	Understand water quality, treatment plants, storage, distribution, sewer design, sewage treatment, and sludge disposal for enhanced employability.
Civil Engineering	22CE3251	Strength of Materials	✓	✓	✓	✓	Learn shear force, bending moment, torsion, stress analysis, deflection, column behavior, and truss analysis for entrepreneurship and skill development.
Civil Engineering	22CE3252	Mechanics of Fluids	✓	✓	✓	✓	Understand fluid properties, pressure measurement, flow types, velocity, discharge, energy losses, and hydraulic models for skill development.
Civil Engineering	22CE3001	Water and Wastewater Testing Lab	✓	✓	✓	✓	Perform water and wastewater sampling, analyze physical and chemical properties, use modern instrumentation, and conduct bacteriological tests for employability.
Civil Engineering	22CE3072	Computer Aided Building Drawing	✓	✓	✓	✓	Develop proficiency in building planning, design, and drafting using BIM tools, adhering to bye-laws and detailed construction documentation for employability.
Civil Engineering	22CE4201	Structural Analysis	✓	✓	✓	✓	Master structural analysis and influence line techniques to innovate, offer expert engineering services, and launch successful construction or design-focused entrepreneurial ventures.
Civil Engineering	22CE4202	Concrete Technology	✓	✓	✓	✓	Acquire expertise in concrete materials, mix design, and special concretes to develop innovative solutions, start a construction materials business, or provide consultancy services.
Civil Engineering	22CE4203	Highway and Railway Engineering	✓	✓	✓	✓	Gain expertise in highway and railway design, maintenance, and modernization to launch a consultancy or construction firm specializing in advanced transportation infrastructure and high-

							speed rail systems.
Civil Engineering	22CE4251	Surveying	✓	✓	✓	✓	Advanced surveying techniques, including GIS and Total Station applications, to establish a surveying consultancy or geospatial services business catering to construction, infrastructure, and land development projects.
Civil Engineering	22CE4252	Soil Mechanics	✓	✓	✓	✓	Develop expertise in soil classification, testing, and stability analysis to establish a geotechnical consultancy offering solutions for construction site challenges and foundation design for diverse projects
Civil Engineering	22CE4253	Hydraulic Engineering	✓	✓	✓	✓	Learn to classify and design open channel flows, analyze varied flow phenomena, and evaluate turbines and pumps, equipping for hydraulic engineering roles or entrepreneurial ventures
Civil Engineering	22CE4001	Concrete and Highway Engineering Lab	✓	✓	✓	✓	Develop expertise in concrete and material testing to ensure quality control, enabling careers in construction or independent material testing services
Civil Engineering	21CE5201	Structural Analysis - I	✓	✓	✓	✓	Structural analysis methods for beams, frames, and arches, including moment distribution and influence lines, to excel in engineering roles or establish a consultancy specializing in advanced structural design and analysis.
Civil Engineering	21CE5202	Design of RC Elements	✓	✓	✓	✓	Gain expertise in designing RC beams, slabs, columns, and footings using limit state and working stress methods, enhancing employability in structural design roles or preparing for entrepreneurial opportunities in construction and design services.
Civil Engineering	21CE5203	Water Supply Engineering	✓	✓	✓	✓	Learn water quality standards, treatment methods, and design components of water systems, enhancing skills for careers in environmental engineering, water treatment plants, or entrepreneurial opportunities in water infrastructure and plumbing services.

Civil Engineering	21CE5204	Foundation Engineering	✓	✓	✓	✓	Develop expertise in site investigation, foundation design, and retaining wall stability, equipping for roles in geotechnical engineering or entrepreneurship in soil testing, foundation consultancy, and construction services
Civil Engineering	21CE5205	Highway and Railway Engineering	✓	✓	✓	✓	Acquire skills in highway design, materials, and railway track planning to pursue careers in transportation infrastructure development or start an engineering consultancy focused on road and rail systems and modernization projects.
Civil Engineering	21CE5001	Concrete and Highway Engineering Lab	✓	✓	✓	✓	Gain practical knowledge in testing concrete, aggregates, and bitumen properties, enabling you to excel in quality control roles or start a materials testing and consultancy business for the construction and infrastructure sectors.
Civil Engineering	21CE5002	Survey Camp	✓	✓	✓	✓	Develop expertise in field surveying, total station operations, and topographical mapping, enhancing skills for careers in surveying, construction, or starting an independent surveying and land development consultancy.
Civil Engineering	21CE5301	Advanced Surveying Techniques	✓	✓	✓	✓	Gain proficiency in advanced surveying techniques like GPS, photogrammetry, and Total Station for career growth or entrepreneurship in surveying and geospatial services.
Civil Engineering	21CE5302	Traffic Engineering	✓	✓	✓	✓	Develop skills in traffic analysis, intersection design, and accident prevention, preparing for careers or entrepreneurship in traffic engineering and urban planning.
Civil Engineering	21CE5303	Housing Planning and Management	✓	✓	✓	✓	Gain expertise in housing design, cost management, and financial appraisal for careers or entrepreneurship in housing project development and consultancy.

Civil Engineering	21CE5304	Construction Techniques, Equipment and Safety	✓	✓	✓	✓	Acquire practical knowledge in construction techniques, equipment, safety practices, and structural construction, preparing for roles in construction management or starting a construction firm specializing in safe, efficient, and innovative building practices
Civil Engineering	21CE5305	Hydrology	✓	✓	✓	✓	Develop expertise in hydrometeorology, flood analysis, and aquifer management, enhancing skills for careers in water resources engineering or launching a consultancy specializing in flood forecasting, hydrological analysis, and water management solutions.
Civil Engineering	21CE5306	Professional Ethics and Laws for Civil Engineers					Develop strong professional ethics, risk assessment, and safety skills, preparing for ethical leadership roles in engineering or entrepreneurship, focusing on social responsibility, contract laws, and global engineering challenges.
Civil Engineering	21CE5601	Principles of Surveying	✓	✓	✓	✓	Gain hands-on experience in surveying techniques, including theodolite, total station, and contouring, equipping for roles in land surveying, construction, or starting an entrepreneurial business specializing in surveying and mapping services.
Civil Engineering	21CE5602	Sustainable infrastructure Development	✓	✓	✓	✓	Develop expertise in fluid dynamics, water and sewage system design, and software tools, preparing for careers in water resource management, urban infrastructure, or launching a consultancy specializing in water and sewage network design.
Civil Engineering	21CE5206	Advanced Concrete Technology	✓	✓	✓	✓	Concrete mix design, manufacturing methods, and testing techniques for fresh and hardened concrete, gaining skills for careers in construction materials, quality control, or starting an entrepreneurial business in concrete solutions and testing services.

Civil Engineering	21CE5207	Transport of Water and Wastewater	✓	✓	✓	✓	Acquire skills in fluid mechanics, water and sewer system design, and software tools for analysis, preparing for careers in civil engineering or entrepreneurship in water infrastructure design, management, and consultancy
Civil Engineering	21CE5208	Soil Properties and Behaviour	✓	✓	✓	✓	Gain knowledge in soil classification, behavior, and engineering properties, essential for careers in geotechnical engineering. Acquire skills for solving soil-related issues and understanding suitability for foundation design. Prepare for entrepreneurship in soil testing and consultancy services.
Civil Engineering	21CE5209	Fundamentals of Remote Sensing	✓	✓	✓	✓	Develop expertise in remote sensing, image classification, and thermal applications, enhancing skills for careers in geospatial analysis or entrepreneurship in remote sensing, GIS, and environmental consultancy services.
Civil Engineering	21CE6201	Structural Analysis - II	✓	✓	✓	✓	Advanced structural analysis techniques, including flexibility, stiffness matrix, and finite element methods, preparing for roles in structural engineering or launching a consultancy specializing in complex structural design and analysis.
Civil Engineering	21CE6202	Design of Steel Structural Elements	✓	✓	✓	✓	Develop expertise in steel structure design, enhancing skills for structural engineering careers or entrepreneurship in steel construction and consultancy services.
Civil Engineering	21CE6203	Wastewater Engineering	✓	✓	✓	✓	Gain expertise in sewage system design, treatment processes, and sludge management, preparing for careers or entrepreneurship in wastewater management and environmental engineering
Civil Engineering	21CE6204	Construction Management	✓	✓	✓	✓	Skills in project planning, scheduling, cost control, and quality management for construction careers or entrepreneurship in construction project management services.

Civil Engineering	21CE6001	Water and Wastewater Testing Lab	✓	✓	✓	✓	Gain expertise in water and wastewater testing, analysis, and standards compliance, preparing for careers or entrepreneurship in environmental consulting and water quality management.
Civil Engineering	21CE6002	Design and Drawing of RC Structures	✓	✓	✓	✓	Develop skills in designing and drafting structural drawings for retaining walls, bridges, and water tanks, enhancing employability in structural engineering or entrepreneurship in construction design and consultancy services.
Civil Engineering	21CE6701	Internship / Industrial Training	✓	✓	✓	✓	Internship training provides civil engineering students with practical experience, enhancing their technical skills and industry knowledge. It boosts employability by offering real-world insights, preparing them for entrepreneurship or roles in construction and infrastructure projects.
Civil Engineering	21CE6301	Building Services	✓	✓	✓	✓	The content covers essential skills for designing electrical, lighting, ventilation, fire safety, and plumbing systems in buildings, fostering employability and entrepreneurship in construction, engineering, and sustainability sectors.
Civil Engineering	21CE6302	Airports, Docks and Harbour Engineering	✓	✓	✓	✓	Develop expertise in airport and harbor design, including components, layouts, and coastal structures, enhancing skills for careers in transportation infrastructure or entrepreneurship in airport, harbor, and coastal project design.
Civil Engineering	21CE6303	Subsurface Investigation and Field Testing	✓	✓	✓	✓	Acquire skills in geophysical exploration, soil sampling, and bearing capacity estimation, preparing for careers in geotechnical engineering or entrepreneurship in soil testing and consulting services.
Civil Engineering	21CE6304	Groundwater Engineering	✓	✓	✓	✓	Gain expertise in groundwater management, quality assessment, and recharge techniques, preparing for careers in environmental engineering or

							entrepreneurship in water resource management and sustainable groundwater solutions.
Civil Engineering	21CE6305	Architecture and Town Planning	✓	✓	✓	✓	Develop skills in architectural design, site analysis, and sustainable building practices, preparing for careers in architecture, urban planning, or entrepreneurship in building design and consultancy services.
Civil Engineering	21CE6306	Disaster Preparedness and Planning	✓	✓	✓	✓	Acquire expertise in disaster risk reduction, safety practices, and management, preparing for careers in disaster management or entrepreneurship in risk assessment, mitigation, and safety consulting services.
Civil Engineering	21CE6601	Construction Technology	✓	✓	✓	✓	Develop expertise in construction planning, substructure and superstructure design, accessibility, and building techniques, preparing for careers in construction management or entrepreneurship in inclusive design and building services.
Civil Engineering	21CE6602	Soil and Foundations	✓	✓	✓	✓	Gain expertise in soil classification, testing, and foundation analysis, preparing for careers in geotechnical engineering or entrepreneurship in soil testing, site investigation, and foundation design services.
Civil Engineering	21CE6603	Sustainable Agriculture and Environmental Management	✓	✓	✓	✓	Develop skills in construction planning, substructure/superstructure design, inclusive building design, and roofing techniques, preparing for careers in construction management or entrepreneurship in building design and implementation services
Civil Engineering	21CE6604	Sustainable Bio Materials	✓	✓	✓	✓	Develop expertise in biomaterials, biopolymers, bioceramics, metals, and nanobiomaterials, enhancing skills for careers in biomaterials research, healthcare engineering, or entrepreneurship in

							medical device and materials innovation.
Civil Engineering	21CE6205	Advanced Concrete Structures	✓	✓	✓	✓	Gain expertise in designing flexural members, compression elements, and special RC structures, preparing for careers in structural engineering or entrepreneurship in civil design, analysis, and construction services.
Civil Engineering	21CE6206	Design of Physico-Chemical Treatment Systems	✓	✓	✓	✓	Designing water and wastewater treatment plants, enhancing employability in environmental engineering or entrepreneurship in water treatment and infrastructure management services.
Civil Engineering	21CE6207	Site Exploration and Soil Investigation	✓	✓	✓	✓	Learn water quality standards, treatment methods, and design components of water systems, enhancing skills for careers in environmental engineering, water treatment plants, or entrepreneurial opportunities in water infrastructure and plumbing services.
Civil Engineering	21CE6208	Advanced Remote Sensing	✓	✓	✓	✓	Develop expertise in remote sensing, image classification, and thermal applications, enhancing skills for careers in geospatial analysis or entrepreneurship in remote sensing, GIS, and environmental consultancy services.
Civil Engineering	21CE6209	Finite Element Analysis in Structural Engineering	✓	✓	✓	✓	Structural analysis methods for beams, frames, and arches, including moment distribution and influence lines, to excel in engineering roles or establish a consultancy specializing in advanced structural design and analysis.
Civil Engineering	21CE6210	Design of Biological Treatment Systems	✓	✓	✓	✓	Develop expertise in biomaterials, biopolymers, bioceramics, metals, and nanobiomaterials, enhancing skills for careers in biomaterials research, healthcare engineering, or entrepreneurship in medical device and materials innovation.
Civil Engineering	21CE6211	Environmental Geo-technology	✓	✓	✓	✓	Gain expertise in groundwater management, quality assessment, and recharge techniques, preparing for careers in environmental engineering or

							entrepreneurship in water resource management and sustainable groundwater solutions.
Civil Engineering	21CE6212	Fundamentals of Geodesy	✓	✓	✓	✓	Gain knowledge in soil classification, behavior, and engineering properties, essential for careers in geotechnical engineering. Acquire skills for solving soil-related issues and understanding suitability for foundation design. Prepare for entrepreneurship in soil testing and consultancy services.
Civil Engineering	19CE6401	Remote Sensing and GIS	✓	✓	✓	✓	Develop expertise in remote sensing, image classification, and thermal applications, enhancing skills for careers in geospatial analysis or entrepreneurship in remote sensing, GIS, and environmental consultancy services.
Civil Engineering	19CE7201	Water Resources and Irrigation Engineering	✓	✓	✓	✓	Acquire skills in fluid mechanics, water and sewer system design, and software tools for analysis, preparing for careers in civil engineering or entrepreneurship in water infrastructure design, management, and consultancy
Civil Engineering	19CE7202	Structural Dynamics and Earthquake Engineering	✓	✓	✓	✓	Advanced structural analysis techniques, including flexibility, stiffness matrix, and finite element methods, preparing for roles in structural engineering or launching a consultancy specializing in complex structural design and analysis.
Civil Engineering	19CE7203	Estimation, Costing and Valuation	✓	✓	✓	✓	Develop skills in building estimation, rate analysis, valuation, and report preparation, enhancing employability in construction project management or entrepreneurship in real estate and property valuation services.
Civil Engineering	19CE7001	Design and Drawing of Steel Structures	✓	✓	✓	✓	Develop skills in designing and drafting structural drawings for retaining walls, bridges, and water tanks, enhancing employability in structural engineering or entrepreneurship in construction design and consultancy services.

Civil Engineering	19CE7901	Project I - Design Project	✓	✓	✓	✓	Design projects develop practical problem-solving, technical, and communication skills, boosting employability and fostering entrepreneurship in engineering, construction, and design-related fields.
Civil Engineering	19CE7301	Pre stressed Concrete Structures	✓	✓	✓	✓	Develop skills in designing and drafting structural drawings for retaining walls, bridges, and water tanks, enhancing employability in structural engineering or entrepreneurship in construction design and consultancy services.
Civil Engineering	19CE7302	Air Pollution Management	✓	✓	✓	✓	Air pollution management equips students with environmental expertise, enhancing employability in environmental engineering, urban planning, or entrepreneurship in sustainable infrastructure and pollution control solutions.
Civil Engineering	19CE7303	Industrial Wastewater Treatment	✓	✓	✓	✓	Industrial wastewater treatment knowledge enhances students' skills in environmental engineering, preparing them for careers or entrepreneurship in wastewater management, environmental consultancy, and sustainable industrial practices.
Civil Engineering	19CE7304	Composite Structures	✓	✓	✓	✓	Composite structures knowledge equips students with expertise in innovative materials and design, enhancing employability in structural engineering or entrepreneurship in advanced construction and material technology.
Civil Engineering	19CE7305	Finite Element Analysis	✓	✓	✓	✓	Finite Element Analysis enhances problem-solving skills, preparing students for careers in structural design or entrepreneurship in engineering simulations and analysis services.
Civil Engineering	19CE8301	Ground Improvement Techniques	✓	✓	✓	✓	Ground improvement techniques equip students with skills for geotechnical engineering roles or entrepreneurship in foundation and soil

							stabilization services
Civil Engineering	19CE8302	Prefabricated Structures	✓	✓	✓	✓	Prefabricated structures enhance students' skills in modular construction, boosting employability in project management or entrepreneurship in innovative building solutions
Civil Engineering	19CE8303	Valuation of Land and Buildings	✓	✓	✓	✓	Valuation of land and buildings equips students with skills for property appraisal, real estate, and entrepreneurship in construction and infrastructure projects.
Civil Engineering	19CE8304	Municipal Solid Waste Management	✓	✓	✓	✓	Municipal solid waste management enhances students' expertise in environmental engineering, preparing them for careers or entrepreneurship in waste management and sustainable infrastructure solutions
Civil Engineering	19CE8305	Design of Formwork	✓	✓	✓	✓	Design of formwork equips students with practical skills for construction projects, boosting employability in project management or entrepreneurship in construction services.
Civil Engineering	19CE8306	Non Destructive Testing of Structures	✓	✓	✓	✓	Non-destructive testing of structures enhances students' skills in evaluating infrastructure, improving employability in structural inspection or entrepreneurship in testing and maintenance services.
Civil Engineering	19CE8307	Construction Economics and Finance	✓	✓	✓	✓	Construction economics and finance provide students with essential skills for project budgeting, cost management, and entrepreneurship in construction business operations.

Civil Engineering	19CE8308	Repair and Rehabilitation of Structures	✓	✓	✓	✓	Repair and rehabilitation of structures equips students with specialized skills for maintaining infrastructure, enhancing employability in construction and entrepreneurial opportunities in restoration services.
Civil Engineering	19CE8309	Disaster Resistant Structures	✓	✓	✓	✓	Disaster-resistant structures teach students essential skills for designing resilient buildings, boosting employability in construction, and entrepreneurship in disaster recovery services.
Civil Engineering	19CE8310	Environmental Impact Assessment	✓	✓	✓	✓	Environmental Impact Assessment equips students with skills to assess and mitigate environmental risks, enhancing employability in sustainable construction and entrepreneurship in eco-friendly project management.
Civil Engineering	19CE8311	Construction Safety Practices	✓	✓	✓	✓	Construction safety practices teach students essential skills for maintaining site safety, improving employability in construction management and entrepreneurship in safety compliance services.
Civil Engineering	19CE8312	IoT for Smart City Planning	✓	✓	✓	✓	IoT for Smart City Planning enhances students' skills in technology integration, boosting employability in smart infrastructure design and entrepreneurial opportunities in urban development solutions.
Civil Engineering	19CE7201	Water Resources and Irrigation Engineering			✓		Understand the geological processes and structures of soil profile and ability to select suitable building material for Civil Engineering projects.
Civil Engineering	19CE7202	Structural Dynamics and Earthquake Engineering			✓		Understand the theory of vibrations and determine response of structures.Ability to design earthquake resistant structures.
Civil	19CE7203	Estimation, Costing			✓		Understand the method of valuating the material requirement and quantity assessment for a

Engineering		and Valuation					construction and estimate the amount for construction
Civil Engineering	19CE7001	Design and Drawing of Steel Structures			✓		Understand the basic knowledge on the hardware and software components in CAD system and design principles and optimize the design.
Civil Engineering	19CE7301	Prestressed Concrete Structures			✓		Understand the knowledge on the design principles of prestressed concrete and analyze the composite members like Water tank and pipes.
Civil Engineering	19CE7302	Air Pollution Management		✓			Understand the importance of managing the effects the air pollution and how to control it.
Civil Engineering	19CE8301	Ground Improvement Techniques				✓	Understand the role and methods of ground improvement techniques to improve the engineering properties of soil.
Civil Engineering	19CE8302	Prefabricated Structures			✓		Understand the various elements of prefabricated structures and get an exposure on design principles of prefabricated units
Civil Engineering	19CE8303	Valuation of Land and Buildings	✓				Understand the method of valuating the building and estimate the amount for construction and also to estimate the depreciation of the building based of the age of the property
Civil Engineering	19CE8304	Municipal Solid Waste Management				✓	Understanding the Classification of solid waste and determine the effects of poor waste management on public health and the environment; Interpretation on the application of various solid waste off- site processing and disposal technologies in the modern world.

Civil Engineering	19CE7201	Water Resources and Irrigation Engineering	✓	✓	✓	✓	Understand how water resources are developed and how needs are quantified, and to learn the potential for extreme hydrologic events (e.g. floods and droughts) are analyzed and quantified.
Civil Engineering	19CE7202	Structural Dynamics and Earthquake Engineering	✓	✓	✓	✓	To learn the basics of various dynamic forces and behavior of structure in response to earthquakes and the importance of ductility in earthquake resistance design.
Civil Engineering	19CE7203	Estimation, Costing and Valuation		✓	✓	✓	Understand the preparation of an abstract Estimate and detailed estimate of building and to understand preparation of notice inviting tender document for bidding, tendering process and examining rate analysis of civil works.
Civil Engineering	19CE7301	Prestressed Concrete Structures	✓	✓	✓	✓	To incorporate the basic fundamentals of prestressing in civil engineering and to design the prestressed concrete flexural members.
Civil Engineering	19CE7302	Air Pollution Management	✓	✓	✓	✓	Interpret the sources dispersion, control equipment and regulate the requirements of air pollutants.
Civil Engineering	19CE7303	Industrial Wastewater Treatment	✓	✓	✓	✓	To study the various industrial effluent treatment methods and characterize the treatment based on case studies.
Civil Engineering	19CE7304	Composite Structures	✓	✓	✓	✓	To study the code provisions and design of ste concrete composite construction and the behavior box girder bridges.
Civil Engineering	19CE7305	Finite Element Analysis	✓	✓	✓	✓	To comprehend the concept and method of finite elements analysis and relate the iso-parametric

							elements with its elements.
Civil Engineering	19CE7306	Computer Aided Design of Structures	✓	✓	✓	✓	Able to justify the application of hardware and software components in design and implement the modeling concepts of graphic standard.
Civil Engineering	19CE8301	Ground Improvement Techniques	✓	✓	✓	✓	Explore the application of engineering methods of ground improvement in the geo technical problems in soils.
Civil Engineering	19CE8302	Prefabricated Structures	✓	✓	✓	✓	To analyze and design structural units for various prefabricated structures.
Civil Engineering	19CE8303	Valuation of Land and Buildings	✓	✓	✓	✓	To understand the various techniques of building valuation and different methods of valuation of immovable properties.
Civil Engineering	19CE8304	Municipal Solid Waste Management	✓	✓	✓	✓	Asses the options for source reduction of waste and suggest suitable methods for onsite storage and processing.
Civil Engineering	19CE8305	Design of Formwork	✓	✓	✓	✓	To understand the formwork materials and formwork support and identify the process of formwork failure.
Civil Engineering	19CE8306	Non-Destructive Testing of Structures		✓	✓	✓	To understand the principle and applications of visual inspection and liquid penetrant testing.
Civil Engineering	19CE8307	Construction Economics and Finance	✓	✓	✓	✓	To provide a framework for interpreting the economic and financial issues in relation to the construction industry, construction firms, and

							construction projects.
Civil Engineering	19CE8308	Repair and Rehabilitation of Structures	✓	✓	✓	✓	To get awareness on maintenance, rehabilitation an repair strategies.Understand the retrofitting strategie and techniques
Civil Engineering	19CE8309	Disaster Resistant Structures	✓	✓	✓	✓	Explains the Disaster Scenarios; States the details Overviews, Purpose, Planning Proces Communication & Coordination Plans for th Preparedness Planning.
Civil Engineering	19CE8310	Environmental Impact Assessment	✓	✓	✓	✓	To implement environmental management systems i development projects.
Civil Engineering	19CE8311	Construction Safety Practices	✓	✓	✓	✓	Understand the hazards at the construction workplac and to learn implement controls to manage th construction hazards/risk, comprehend safe ways working for all major construction activities.
Civil Engineering	19CE8312	IoT for Smart City Planning		✓	✓	✓	To impart knowledge on the usage of IOT devices t collect and analyze data in improving th infrastructure public utilities and services.

BE COMPUTER SCIENCE AND ENGINEERING

CoursesfocusonGlobal,National,RegionalandLocalNeeds							
Programme	**Course Code**	**Name of the Course**	**Needs**				**Description**
			Global	**National**	**Regional**	**Local**	
Computer Science and Engineering	22CS1151	Problem solving using C Programming	✓	✓	✓	✓	Learning the concepts of C Programming.
Computer Science and Engineering	22MA2103	Differential Equations and Linear Algebra	✓	✓	✓		Study the properties of matrices and the solution of differential equations.
Computer Science and Engineering	22ME2001	Engineering Practices	✓	✓	✓		Interpret the projections of simple solid objects in plan and elevation.
Computer Science and Engineering	19CS7201	Cryptography and Network Security	✓	✓	✓	✓	Understand plain text and cipher test, public key cryptography, rsa algorithms, firewall and hacking concepts.
Computer Science and Engineering	19CS7202	Cloud Computing	✓	✓	✓	✓	To learn distributed communication and distributed resource management. Familiarize the basics of cloud computing, virtualization techniques and cloud securities and standards.

Computer Science and Engineering	19CS7251	Machine Learning Techniques	✓	✓	✓	✓	Supervised learning, unsupervised learning, software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.
Computer Science and Engineering	19CS7001	Cloud Computing Laboratory	✓	✓	✓		Familiarize the basics of cloud computing, virtualization techniques and cloud securities and standards that are applied in real time environment.
Computer Science and Engineering	19CS7002	Security Laboratory	✓	✓	✓	✓	To learn the tools for cryptography, Wi-Fi calling that can be implemented as for security and authentication process.
Computer Science and Engineering	19CS7901	Project Phase I	✓	✓	✓	✓	Demonstrate a sound technical knowledge of their selected project topic. Undertake problem identification, formulation, and solution.
Computer Science and Engineering	19CS7301	Multi-core Architecture and Programming	✓	✓	✓	✓	Understand the computer instructions, Addressing Modes and Performance measurements.
Computer Science and Engineering	19CS7302	Cyber Forensics	✓	✓	✓	✓	Understand the Organizational implications on Cyber Security.
Computer Science and Engineering	19CS7303	Wireless Sensor Networks	✓	✓	✓	✓	Learn the Routing and Security issues in Ad hoc and Sensor networks.

Computer Science and Engineering	19CS7304	C# and .Net Programming	✓	✓	✓	✓	Learning Basics of C Language and the Advanced Features of C, Net Framework to develop Distributed applications.
Computer Science and Engineering	19CS7305	Software Testing	✓	✓	✓	✓	Learning the different types and levels of Software Testing.
Computer Science and Engineering	19CS7401	Foundation Skills in Information Technology	✓	✓	✓	✓	Understand the functionalities of the Operating systems such as Memory Management, Process Management, File System Management, Device Management.
Computer Science and Engineering	19CS8901	Project Phase II	✓	✓	✓	✓	Demonstrate a sound technical knowledge of their selected project topic. Undertake problem identification, formulation, and solution.
Computer Science and Engineering	19CS8301	Digital Image Processing	✓	✓	✓	✓	Apply digital computation to process digital images via an algorithm.
Computer Science and Engineering	19CS8302	High Speed Networks	✓	✓	✓	✓	Compare and analyze the fundamental principles of various high speed communication networks and their protocol.
Computer Science and Engineering	19CS8303	Information Security	✓	✓	✓	✓	Learning the basic concepts of Information Security and its life cycle.
Computer Science and	19CS8304	Human Computer Interaction	✓	✓	✓	✓	Understand the foundations of Human Computer Interaction.

Engineering							
Computer Science and Engineering	19CS8305	Responsive Web Design	✓	✓	✓	✓	Access to content that is appropriately adapted on any device to improve the user experience and learn the enhancement of interaction and e-commerce.
Computer Science and Engineering	19CS8306	Information Retrieval Techniques	✓	✓	✓	✓	Acquire knowledge in Query Languages in Information Retrieval.
Computer Science and Engineering	19CS8307	User Interface Design	✓	✓	✓	✓	Identify and define key terms related to user interfaces and user interface design and implementation.
Computer Science and Engineering	19CS8308	Visualization Techniques	✓	✓	✓	✓	Design effective data visualizations in order to provide new insights into a research question or communicate information to the viewer.
Computer Science and Engineering	19CS8309	Deep Learning	✓	✓	✓	✓	Understand the basics of Deep Learning and enable the students to know Deep Learning Techniques to support Real-Time Applications
Computer Science and Engineering	19CS8310	Block Chain Technology	✓	✓	✓	✓	Understand Blockchain's Fundamental Components, and examine decentralization Using Blockchain

BE ELECTRICAL AND ELECTRONICS ENGINEERING

Courses Focus on Global, National, Regional and Local Needs

Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Electrical and Electronics Engineering	22ME2001	Engineering Practices Laboratory	✓				Demonstrate and Study and acquire knowledge on various basic electrical and electronics circuits used in daily life
Electrical and Electronics Engineering	22HE1071	UHV	✓	✓	✓	✓	To inherent dignity, worth, and rights of every individual, regardless of differences in background, beliefs, or circumstances.
Electrical and Electronics Engineering	22HE1072	Entrepreneurship & Innovation	✓	✓	✓	✓	To transform ideas into tangible solutions, driving economic growth, and shaping the landscape of industries and societies.
Electrical and Electronics Engineering	22HE3071	Soft skills and Aptitude-II	✓	✓	✓	✓	A soft skills test is all about assessing your non-technical abilities, the ones that make you a well-rounded and effective employee.
Electrical and Electronics Engineering	22HE3072	Fundamentals of JAVA Programming	✓	✓	✓	✓	Java is one of the most popular and widely used programming language and platform. A platform is an environment that helps to develop and run programs

							written in any programming language. Java is fast, reliable and secure.
Electrical and Electronics Engineering	22MA3102	Complex Analysis and Transforms	✓	✓	✓	✓	It involves the study of complex functions which in turn requires us to describe a number of special classes of subsets of the complex plane
Electrical and Electronics Engineering	22EE3201	Electronic Devices and Circuits	✓	✓	✓	✓	To educate the basics of Semiconductors and its structure. Working of Small signal amplifiers and its applications with power devices.
Electrical and Electronics Engineering	22EE3203	Field Theory	✓	✓	✓	✓	It is a fundamental branch of physics that deals with the study of electric and magnetic fields, their properties, and their interactions with matter.
Electrical and Electronics Engineering	22EE3001	Electric Circuits Laboratory	✓	✓	✓	✓	It provides a hands-on learning experience for students to explore and understand the fundamental concepts of electric circuits.
Electrical and Electronics Engineering	22EE3002	Electronic Devices and Circuits Laboratory	✓	✓	✓	✓	Skill Development
Electrical and Electronics Engineering	21HE5071	Soft Skills - 4	✓	✓	✓	✓	To develop the soft skills through various mathods, instruction and knwledge. To develop language skills and interpersonal skills throgh personality development programs.

Electrical and Electronics Engineering	21HE5072	Design Thinking	✓	✓	✓	✓	To fosters a holistic approach to problem-solving, emphasizing empathy, creativity, and iterative prototyping to generate user-centered solutions that address complex challenges effectively.
Electrical and Electronics Engineering	21EE5201	Design of Electrical Machines	✓	✓	✓	✓	It is a critical aspect of electrical engineering that involves the comprehensive process of developing and optimizing the various components and systems
Electrical and Electronics Engineering	21EE5202	Renewable and Non-Renewable Energy Sources	✓	✓	✓	✓	To study about the Renewable energy sources, such as wind, solar, and water, replenish themselves naturally and are sustainable long-term, while nonrenewable energy sources like coal and oil are finite, taking millions of years to form and cannot be replenished once used.
Electrical and Electronics Engineering	21EE5203	Microprocessors and Microcontrollers	✓	✓	✓	✓	It is a standalone processing unit that requires external components to Function, and it is a self-contained chip that integrates the CPU core with memory and peripherals on a single chip, making it ideal for embedded systems and specific applications.
Electrical and Electronics Engineering	21EE5204	Transmission and Distribution	✓	✓	✓	✓	It refer to the stages involved in carrying electricity from power generation sources to end consumers.

Electrical and Electronics Engineering	21EE5251	Control Systems Engineering	✓	✓	✓	✓	It is an interdisciplinary field that deals with the design, analysis, and optimization of control systems.
Electrical and Electronics Engineering	21EE5001	Control and Instrumentation Laboratory	✓	✓	✓	✓	It include designing and building instrumentation, signal processing research, image reconstruction, image processing, and data analysis algorithms to advance sensitivity, resolution, and spatial imaging capabilities for biomedical applications.
Electrical and Electronics Engineering	21EE5002	Microprocessors and Microcontrollers Laboratory	✓	✓	✓	✓	It is a hands-on learning environment that allows students to gain practical experience in working with microprocessors and microcontrollers
Electrical and Electronics Engineering	21EE6701	Internship Training	✓	✓	✓	✓	To Establish an exposure for the students to the work environment, common practices, employment opportunities and work ethics in the relevant field.
Electrical and Electronics Engineering	21HE6071	Soft Skills - II	✓	✓	✓	✓	To make the students aware of the importance, the role and the content of softskills through instruction, knowledge acquisition, demonstration and practice.
Electrical and Electronics Engineering	21HE6072	Intellectual Property Rights (IPR)	✓	✓	✓	✓	To incentivize innovation and creativity by granting exclusive rights to creators and inventors, thereby fostering economic growth, promoting

							technological advancement, and ensuring fair recognition and protection of intellectual assets.
Electrical and Electronics Engineering	21EE6181	Industrial Safety Management	✓	✓	✓	✓	It is a critical aspect of ensuring the well-being of employees and the success of industrial operations.
Electrical and Electronics Engineering	21EE6201	Power Electronics					It is a field of electronics that focuses on controlling the flow of current and voltage, converting it into a form suitable for various user loads
Electrical and Electronics Engineering	21EE6202	Power System Analysis	✓	✓	✓	✓	It involves various studies and engineering investigations to analyze how a power system responds to different events and conditions over time.
Electrical and Electronics Engineering	21EE6001	Power Electronics Laboratory	✓	✓	✓	✓	It focuses on high-power electronics technologies for medium voltage applications, operating with voltages in the kV range, currents in the kA range, and powers in the MW range.
Electrical and Electronics Engineering	21EE6002	Control Wiring and Circuit Design Laboratory	✓	✓	✓	✓	It focuses on control wiring and circuit design typically provide hands-on experience in designing, building, and testing control systems and circuits
Electrical and Electronics Engineering	19EE7901	Project Work – Phase I	✓	✓	✓	✓	Create innovation ideas and making Prototype/Working models

Electrical and Electronics Engineering	19EE7201	Solid State Drives	✓	✓	✓	✓	It is a semiconductor-based storage devices that use solid-state memory, typically NAND flash memory, to store data persistently. Unlike traditional hard disk drives (HDDs), SSDs do not have moving parts, making them faster, more durable, and quieter.
Electrical and Electronics Engineering	19EE7202	Protection and Switchgears	✓	✓	✓	✓	It is desinged to detect and mitigate faults, such as short circuits and overloads,promptly.
Electrical and Electronics Engineering	19EE7251	Power System Operation and Control	✓	✓	✓	✓	To maintain continuous supply of power with an acceptable quality,to all the consumers in the system.
Electrical and Electronics Engineering	19EE7001	Electric Drives and Control Laboratory	✓	✓	✓	✓	It is equipped with state-of-the-art equipment and tools to facilitate experiments and projects related to electric drives, renewable energy, and power electronics.
Electrical and Electronics Engineering	19EE7002	Power System Simulation Laboratory	✓	✓	✓	✓	It is a research facility focused on modeling, simulation, and optimization of electric power systems.
Electrical and Electronics Engineering	19EE8901	Project Work – Phase II	✓	✓	✓	✓	Create innovation ideas and making Prototype/Working models
Electrical and Electronics	19EE6701	Internship/Industrial Training	✓	✓	✓	✓	Explore career alternatives prior to graduation and to integrate theory and practice to assess interests and abilities

Engineering							in their field of study.
Electrical and Electronics Engineering	19EE7301	High Voltage Engineering	✓	✓	✓	✓	Perform a dynamic response analysis of high voltage measurement systems, compute the breakdown strength of gas, liquids and solids insulation systems, transient voltages.
Electrical and Electronics Engineering	19EE7302	Electrical Energy Utilization and Conservation		✓	✓		Gain knowledge of various sources of renewable power plants and its utility.
Electrical and Electronics Engineering	19EE7303	Internet of Things for Electrical Grid		✓	✓		Provide knowledge about smart electric power grids, including definition, design criteria, technology and IoT.
Electrical and Electronics Engineering	19EE7304	Advanced Control Theory		✓	✓	✓	Define and explain the basic properties multivariable linear systems such a controllability, observability, and transf functions.
Electrical and Electronics Engineering	19EE7305	Neural Networks and Fuzzy systems	✓	✓	✓	✓	Comprehend the concepts of feed forward neural networks, analyze the various feedback networks and understand the concept of fuzziness involved in various systems and fuzzy set theory.
Electrical and Electronics Engineering	19EE8301	Special Electrical Machines		✓	✓	✓	Learn the fundamental knowledge of the special purpose electrical machines and their industrial needs.

Electrical and Electronics Engineering	19EE8302	Microcontroller Based System Design		✓	✓	✓	To understand the concepts of microcontroller-based system, to enable design and programming of microcontroller-based system.
Electrical and Electronics Engineering	19EE8303	Smart Grid	✓	✓	✓	✓	Smart electric power grids, including definition, design criteria, technology and IoT and information processing and communications to the power grid.
Electrical and Electronics Engineering	19EE8304	Advanced Soft Computing	✓	✓	✓	✓	Learn about soft computing techniques and their applications and to analyze various neural network architectures and to understand perceptron's and counter propagation networks.
Electrical and Electronics Engineering	19EE8305	Power System Transients		✓	✓	✓	Gain knowledge through the power system operation and study about the Transients.
Electrical and Electronics Engineering	19EE8306	Preventive Maintenance of Electrical Apparatus	✓	✓	✓	✓	Prevent equipment failure before it occurs, and to reduce the risk of accidents.
Electrical and Electronics Engineering	19EE8307	High Voltage Direct Current Transmission	✓	✓	✓	✓	Develop the knowledge of HVDC transmission and HVDC converters and the applicability and advantage of HVDC transmission over conventional AC transmission.
Electrical and Electronics	19EE8308	Energy Auditing and Energy Management		✓	✓	✓	Educate the electrical energy demands and how to conserve the energy. Learn the role of Energy auditors and

Engineering							Managers.
Electrical and Electronics Engineering	19EE8309	Application of Power Electronics for Renewable Energy Systems		✓	✓	✓	Demonstrate the power electronic controllers for controlling the parameters in Renewable System.
Electrical and Electronics Engineering	19EE8310	Intellectual Property Rights	✓	✓	✓	✓	Recognize the importance of IP and to educate the pupils on basic concepts of Intellectual Property Rights, the statutory provisions of different forms of IPRs in simple forms and to learn the procedure of obtaining Patents, Copyrights, Trade Marks & Industrial Design.
Electrical and Electronics Engineering	19EE7201	Solid State Drives		✓	✓	✓	Educate the operation of controllers used to control the electric drives and operate the drives in stable operation.
Electrical and Electronics Engineering	19EE7202	Protection and Switchgears		✓	✓	✓	Understand and to know the following concepts: To understand the types of Circuit breakers and relays for protection of Generators, Transformers and feeder bus bar from Over voltages. To describe the important of neutral grounding for overall protection.
Electrical and Electronics Engineering	19EE7251	Power System Operation and Control		✓	✓	✓	Demonstrate the ability to Understand the differences between signal level and power level devices, Analyze controlled rectifier circuits, operation of DC-DC choppers, inverters and cyclo-

							converters.
Electrical and Electronics Engineering	19EE7001	Electric Drives and Control Laboratory		✓	✓	✓	Demonstrate the power electronic controllers for controlling the electric drives and operate the drives in stable operation.
Electrical and Electronics Engineering	19EE7002	Power System Simulation Laboratory	✓	✓	✓	✓	Develop a program in a suitable package to assess the performance of medium and long transmission lines. Develop a program in a suitable package to obtain the power angle.

BE ELECTRONICS AND COMMUNICATION ENGINEERING

CoursesFocusonGlobal,National,RegionalandLocalNeeds

Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Electronics and Communication Engineering	22MA1101	Matrices and Calculus	✓		✓	✓	Study the properties of matrices and the solution of differential equations.
Electronics and Communication Engineering	22EC1151	Electron Devices		✓	✓	✓	Understand the concepts and characteristics of basic electronics components

Electronics and Communication Engineering	22IT1151	Python Programming and Practices		✓	✓	✓	Skill Development - Understand the concepts of tuples, dictionary, identifiers exception handling concepts.
Electronics and Communication Engineering	22MA2102	Differential Equations and Laplace Transform	✓	✓		✓	Study the properties of matrices and the solution of differential equations.
Electronics and Communication Engineering	22ME2001	Engineering Practices		✓	✓	✓	Interpret the projections of simple solid objects into plan and elevation.
Electronics and Communication Engineering	22CS2255	Programming Using C	✓		✓	✓	Programming basics and the fundamentals of C, Data types in C, Mathematical and logical operations, Arranging data in arrays, Implementing pointers, File management and dynamic memory allocation
Electronics and Communication Engineering	22CS2253	Java Fundamentals	✓	✓	✓	✓	Learning the basics of Java programming language. Learn an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
Electronics and Communication Engineering	22MA3102	COMPLEX ANALYSIS AND TRANSFORMS	✓	✓	✓	✓	Gaining the concepts of Fourier transforms apply in to signal concepts.
Electronics and Communication Engineering	22EC3201	ELECTRONIC CIRCUITS	✓	✓	✓	✓	Analyze small signal amplifiers using h-parameters and understand their frequency responses and configurations, including CE and multistage amplifiers

Electronics and Communication Engineering	22EC3202	SIGNALS AND SYSTEMS	✓	✓	✓	✓	Understand the time domain and frequency demain concepts and behavious of continuous and discrete signals
Electronics and Communication Engineering	22EC3203	DIGITAL ELECTRONICS	✓	✓	✓	✓	Apply Arithmetic operations in any number system and various techniques to simplify the Boolean functions and build combinational circuits that perform arithmetic operations & Code conversions.
Electronics and Communication Engineering	22EC3204	CIRCUITS AND NETWORKS	✓	✓	✓	✓	Apply network reduction techniques and determine the behaviour of the given DC and AC circuit and analyze series and parallel resonance, impedance variation with frequency, Q factor and coupled circuits
Electronics and Communication Engineering	22EC3251	OOPS USING JAVA	✓	✓	✓	✓	Design program using User defined packages and interfaces and develop applications using exception handling in java
Electronics and Communication Engineering	22EC3001	ELECTRONIC CIRCUITS LABORATORY	✓	✓	✓	✓	Design and analyze biasing circuits and performance analyze of circuits using PSPICE
Electronics and Communication Engineering	22EC3002	DIGITAL ELECTRONICS LABORATORY	✓	✓	✓	✓	Analyze the performance of various combinational circuits and synchronous logic circuits using hardware description language
Electronics and Communication Engineering	22HE4101	IPR AND START-UPS	✓	✓	✓	✓	Analyze the function and acquisition of trademark rights, protectable matters, and the processes involved in trademark

							registration.
Electronics and Communication Engineering	22EC4201	ELECTRO MAGNETIC FIELDS	✓	✓	✓	✓	Gain the physical understanding and the electromagnetic fields and wave concepts
Electronics and Communication Engineering	22EC4202	ANALOG COMMUNICATION	✓	✓	✓	✓	Understand the concepts of AM,FM transmitter and receiver circuits Calculating bandwidth and noise performance.
Electronics and Communication Engineering	22EC4203	LINEAR INTEGRATED CIRCUITS	✓	✓	✓	✓	To understand the concept and applications of OPAMP, Timer and its applications
Electronics and Communication Engineering	22EC4304	TRANSMISSION LINES AND WAVEGUIDES	✓	✓	✓	✓	Concept and behaviour of transmission lines and waveguides
Electronics and Communication Engineering	22EC4251	CONTROL SYSTEMS	✓	✓	✓	✓	Apply the gained knowledge for modeling of mechanical, electrical control systems.
Electronics and Communication Engineering	22EC4253	DATA COMMUNICATION AND NETWORKS	✓	✓	✓	✓	Basic concepts of network technologies, routing techniques ,web applications ,network algorithms and protocols
Electronics and Communication Engineering	22EC4001	LINEAR INTEGRATED CIRCUITS LAB	✓	✓	✓	✓	Gain and Expansion of the basic building blocks of the Integrated circuits along with fundamental concepts of electronic circuits like operational amplifiers, rectifiers & timers and acquire the knowledge in analysis and design IC based circuits.

Electronics and Communication Engineering	22EC4002	ANALOG COMMUNICATION LAB	✓	✓	✓	✓	Analyze the impact of transmitter and receiver characteristics and assess Pulse amplitude modulation and time division multiplexing
Electronics and Communication Engineering	21EC5201	MICROPROCESSOR AND MICROCONTROLLER	✓	✓	✓	✓	Architecture and interfacing of 8086 and 8051.
Electronics and Communication Engineering	21EC5202	TRANSMISSION LINES AND WAVE GUIDES	✓	✓	✓	✓	Concept and behavior of transmission lines and waveguides
Electronics and Communication Engineering	21EC5203	VLSI DESIGN	✓	✓	✓	✓	Building blocks of MOS and CMOS circuits
Electronics and Communication Engineering	21EC5301	MEASUREMENTS AND INSTRUMENTATION	✓	✓	✓	✓	Identify various types of transducers and their working and explore the knowledge on instruments
Electronics and Communication Engineering	21EC5252	DIGITAL SIGNAL PROCESSING	✓	✓	✓	✓	Design of infinite and finite impulse response filters, principal of mutirate and adaptive filters
Electronics and Communication Engineering	21EC5001	VLSI DESIGN LAB	✓	✓	✓	✓	Coding using Verilog and implement digital circuits using FPGA
Electronics and Communication Engineering	21EC5002	MICROPROCESSORS AND MICROCONTROLLE	✓	✓	✓	✓	Interfacing of 8086 and 8051

		RS LAB					
Electronics and Communication Engineering	21EC6202	ANTENNA AND WAVE PROPAGATION	✓	✓	✓	✓	E-radiation characteristics of different types of antennas and propagation of radio waves.
Electronics and Communication Engineering	21EC6181	PRINCIPLES OF MANAGEMENT	✓	✓	✓	✓	Understand the principles and concepts of management. Carry out the process of planning and decision making on employment. Perform organizing, departmentation , Recruitment and training in various organizations.
Electronics and Communication Engineering	21EC6301	MEDICAL ELECTRONICS	✓	✓	✓	✓	Interpret the various assist devices used in the hospitals through pacemakers, defibrillators dialyzers and ventilators
Electronics and Communication Engineering	21EC6251	EMBEDDED SYSTEMS AND IOT	✓	✓	✓	✓	Employability ,system design techniques and networks for embedded systems and the basic concepts of IoT
Electronics and Communication Engineering	21EC6701	INTERNSHIP	✓	✓	✓	✓	Facilitating participants to the current practices of social and environment issues, Familiarity with the concept of various current fields and tools/techniques for the design and development of solutions, Developing confidence and capability amongst the students for further research and field application.
Electronics and Communication	21HE6072	INTELLECTUAL PROPERTY RIGHTS	✓	✓	✓	✓	Recognize the crucial role of IP in organization of different industrial sectors for the purpose

Engineering		(IPR)					of product and technology development
Electronics and Communication Engineering	19EC7201	DIGITAL IMAGE PROCESSING	✓	✓	✓	✓	Relate the concepts of digital image fundamentals and analyze appropriate technique for image enhancement both inspatial and frequency domains
Electronics and Communication Engineering	19EC7202	OPTICAL AND MICROWAVE ENGINEERING	✓	✓	✓	✓	Analyze the transmission characteristics associated with dispersion and polarization techniques and design optical sources, detectors and coupling techniques in optical communication systems
Electronics and Communication Engineering	19EC7302	ASIC DESIGN	✓	✓	✓	✓	Understand the various techniques used in the logic simulation and delay models and analyze the ASIC architecture
Electronics and Communication Engineering	19EC7251	WIRELESS COMMUNICATION	✓	✓	✓	✓	Behavior of the wireless channel and its impact on system design ,modulation and diversity techniques in wireless communications, Multiple access and reservation protocols for wireless propagation
Electronics and Communication Engineering	19EC7001	DIGITAL IMAGE PROCESSING LAB	✓	✓	✓	✓	Classify different classes and analyze color image processing
Electronics and Communication Engineering	19EC7002	OPTICAL COMMUNICATION AND MICROWAVE LAB	✓	✓	✓	✓	Principle of optical sources, detector, fibers and microwave components and optical measurements

Electronics and Communication Engineering	19EC7901	PROJECT WORK – PHASE I	✓	✓	✓	✓	Identify technical ideas statergies and methodologies and prepare the report and present oral demonstration
Electronics and Communication Engineering	19EC8303	SATELLITE COMMUNICATION	✓	✓	✓	✓	Analyze and design satellite communication link and apply various communication techniques for satellite applications
Electronics and Communication Engineering	19EC8901	PROJECT WORK – PHASE II	✓	✓	✓	✓	Validate the technical report and Analyse a methodology to select a good project and able to work in a team.
Electronics and Communication Engineering	19EC7201	Digital Image Processing	✓	✓		✓	Apply the spatial and multispectral enhancement techniques in an image, establish the image compression techniques and to assess the image Representation and Recognition techniques.
Electronics and Communication Engineering	19EC7202	Optical and Microwave Engineering	✓		✓	✓	Gaining knowledge about optical fiber sources and transmission techniques and microwave semiconductor devices and tubes
Electronics and Communication Engineering	19EC7251	Wireless Communication	✓	✓	✓		Learn the different ways of transmission and calculating BER issues in wireless communication.
Electronics and Communication Engineering	19EC7301	Robotics		✓	✓	✓	Learning the electronics and software aspects in the design of robots. Bringing out the different languages for programming robot for industry.

Electronics and Communication Engineering	19EC7302	ASIC Design	✓	✓	✓	✓	Explore the various principles of programmable ASIC design for floor planning and system partitioning along with delay models and logic simulation.
Electronics and Communication Engineering	19EC7303	Global Positioning Systems	✓				Learning GPS architectures and GPS signal characteristics. Gaining the concepts of Differential GPS and applications of GPS
Electronics and Communication Engineering	19EC7304	Cloud Computing		✓	✓	✓	To learn distributed communication and distributed resource management. Familiarize the basics of cloud computing, virtualization techniques and cloud securities and standards.
Electronics and Communication Engineering	19EC7351	Digital Design Verification	✓	✓		✓	Understand the advanced techniques for desiging VLSI circuits
Electronics and Communication Engineering	19EC7352	Embedded Controllers and IoT System Design	✓		✓	✓	Learnig the concepts of embedded controllers and its applications to IOT.
Electronics and Communication Engineering	19EC7901	Project Work – Phase I	✓		✓		Demonstrate a sound technical knowledge of their selected project topic. Undertake problem identification, formulation, and solution.
Electronics and Communication Engineering	19EC8301	Neural networks and Deep learning		✓	✓		And to understand the deep learning techniques to support real-time applications along with case studies.

Electronics and Communication Engineering	19EC8302	Embedded Controllers	✓	✓			Learn the features and architecture of MSP430 microcontroller. Understand the programming and peripheral interface using MSP430 microcontroller families.
Electronics and Communication Engineering	19EC8303	Satellite Communication		✓	✓	✓	Understand the basics of satellite communications and various satellite orbits. Compare the Link budgets & various parameters associated with Uplink/ Down Link.
Electronics and Communication Engineering	19EC8304	Wireless Sensors and Networks	✓		✓	✓	Learn the network architecture of Wireless Sensor Networks. Understand various routing protocols and discuss the applications of WSNs
Electronics and Communication Engineering	19EC8306	Artificial Intelligence		✓	✓	✓	Learning the methods of solving problems using Artificial Intelligence.
Electronics and Communication Engineering	19EC8307	Low Power VLSI	✓	✓		✓	Learning the power optimization and dissipation techniques of low power CMOS circuits.
Electronics and Communication Engineering	19EC8308	Software Defined Radio	✓		✓	✓	Learning the data plane control plane functions of SDR and virtualization techniques.
Electronics and Communication Engineering	19EC8309	Photonic Networks		✓	✓		Understanding the backbone infrastructure the advances in networking and switching domains of photonic networks and the future trends.

Electronics and Communication Engineering	19EC8182	Professional Ethics and Human Values		✓		✓	Inculcating social responsibility for an engineer and gaining the knowledge about the issues related to safety,responsibility and rights.
Electronics and Communication Engineering	19CH8901	Project Work – Phase II	✓	✓	✓	✓	Design engineering solutions to complex problems utilizing a systematic approach.

BE ELECTRONICS AND INSTRUMENTATION ENGINEERING

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Electronics and Instrumentation Engineering	22HE3071	Soft Skills and Aptitude - II	✓	✓	✓	✓	To nurture the soft skills through various mathods, instruction and knwledge. To develop language skills and interpersonal skills throgh personality development programs.
Electronics and Instrumentation Engineering	22HE3072	Fundamentals of JAVA Programming	✓	✓	✓	✓	To understand Object Oriented programming concepts like Data Abstraction, Encapsulation, to analyze different types of constructor, Inheritance and polymorphism and able to know the fundamentals of collection framework and multithreading in solving real world problems

Electronics and Instrumentation Engineering	22EI3201	Electronic Instrumentation	✓	✓	✓	✓	To Explain about digital electronic instruments and its conversion techniques. To Describe the various analog electronic instruments and it's working also to Classify signal generators and different types of wave analyzers and smart instruments
Electronics and Instrumentation Engineering	22EI3203	Sensors and Transducers	✓	✓	✓	✓	Acquirre knowledge on resistive, Inductive and capacitive transducers; Understand different industrial transducers and sensors.
Electronics and Instrumentation Engineering	22EI3251	Digital Electronics	✓	✓	✓	✓	To understand different methods used for the simplification of Boolean functions. To learn combinational circuits and synchrnous circuits and its design
Electronics and Instrumentation Engineering	22HE4101	IPR and Start-ups	✓	✓	✓	✓	To make the students aware of their rights for the protection of their invention done in their projects and to get registration in our country and foreign countries of their invention, designs and thesis or theory written by the students during their project work and for this they must have knowledge of patents, copy right. Moreover to learn about the trademarks and geographical indications (GI) in our country and foreign countries of their invention
Electronics and Instrumentation Engineering	22HE4071	Soft Skills and Aptitude -III	✓	✓	✓	✓	Students able to Solve Quantitative Aptitude , Verbal and Non-verbal Ability and Logical Reasoning questions , case studies for differentint level . Also make display good writing skills while dealing with essays
Electronics and Instrumentation Engineering	22EI3002	Sensors and Transducers Laboratory	✓	✓	✓	✓	- Design the signal conditioning circuits; Analyze the characteristics of different transducers; Understand the calibration techniques in various measuring instruments

Electronics and Instrumentation Engineering	22EE4202	Integrated circuits and its applications	✓	✓	✓	✓	Acquire knowledge on IC fabrication procedure; Apply OP-AMP on various applications like Timers, PLL circuits, ADC and DAC
Electronics and Instrumentation Engineering	22EE4002	Integrated circuits Labaratory	✓	✓	✓	✓	Analyze the performance of code conversion; Evaluate the functions of D to A converter, encoder and decoder; Analyze the performance of Op-amp IC.
Electronics and Instrumentation Engineering	22EI4203	Industrial Instrumentation – I	✓	✓	✓	✓	Infer the Concepts of Speed, Force and Torque Measurements in Instrumentation. To learn the Methods of Acceleration, Vibration, Density and Viscosity Measurements.
Electronics and Instrumentation Engineering	22EI4204	Analytical Instrumentation	✓	✓	✓	✓	Understand the principle of Spectrophotometers, liquid and gas chromatographic techniques ;Gain knowledge about gas analyzers and pollution monitoring system; Analyze pH measurements and dissolved gas components.
Electronics and Instrumentation Engineering	22EI4251	Electrical and Electronic Measurements	✓	✓	✓	✓	Understand the fundamentals of measurement system; Examine the D.C. and A.C. bridges; Understand the data storage and display devices
Electronics and Instrumentation Engineering	22EI1201	Fundamentals of Electrical, Electronics and Instrumentation Engineering	✓	✓	✓	✓	Learn the fundamentals of Electrical circuits, electronics like diodes, rectifiers, filters. Also educate the basic concepts of measurement systems, instrumentation basics.
Electronics and Instrumentation Engineering	22EI2251	Electronic Devices and Circuits	✓	✓	✓	✓	Apply the knowledge acquired about electronic devices, to summarize the concepts of transistors and to transform the acquired skill in designing a circuit.

Electronics and Instrumentation Engineering	19EI7201	Computer Control of Process		✓	✓		Summarize the need of computer in process industry and to demonstrate the use of z transforms for signal processing applications.
Electronics and Instrumentation Engineering	19EI7202	Industrial Electronics		✓	✓	✓	Outline the operation of power semiconductor devices and their switching characteristics andto illustrate the operation of power electronic rectifier circuits.
Electronics and Instrumentation Engineering	19EI7251	Bio-Medical Instrumentation	✓	✓	✓	✓	Compare various linear system simulated responses and to evaluate the discrete controller parameters using different tuning process.
Electronics and Instrumentation Engineering	19EI7001	Computer Control of Process Laboratory			✓	✓	Compare various linear system simulated responses and to evaluate the discrete controller parameters using different tuning process.
Electronics and Instrumentation Engineering	19EI7401	Introduction to Programmable Logic Controllers	✓			✓	Describe the architecture of PLCs with the analogy of relay logic components and develop the ladder logic program for any applications.
Electronics and Instrumentation Engineering	19EI7301	Non-Linear Control System	✓	✓	✓	✓	Understand and analyse the various non-linear systems with describing functions, to design the SISO, MIMO system with feedback linearization and to implement sliding mode control approach to various non-linear applications.
Electronics and Instrumentation	19EI7302R	Industrial IoT	✓	✓	✓	✓	Interpret the security and privacy issues in IoT and to recognize the pattern for IoT and

Engineering							Cyber Manufacturing Systems.
Electronics and Instrumentation Engineering	19EI7303	Robotics and Automation		✓	✓		Apply knowledge on sensors and robotic vision system and familiarize on Various Robotic programming and applications.
Electronics and Instrumentation Engineering	19EI7304	Microcontroller Based System Design		✓	✓		Understand the working of the architecture for PIC microcontrollers and to identify the factors for data transfer in interrupts and understand the timer function of PIC microcontroller.
Electronics and Instrumentation Engineering	19EI7305	Neural Networks and Fuzzy Systems	✓		✓	✓	Infer the concepts of artificial neural networks and to summarize the various neural networks architectures and its training algorithms.
Electronics and Instrumentation Engineering	19EI8301	Fiber Optics and Laser Instruments		✓	✓	✓	Demonstrate fibre optic instrumentation system in industrial applications and establish industrial application of holography and medical applications of lasers.
Electronics and Instrumentation Engineering	19EI8302	Instrumentation in Petrochemical Industries		✓	✓		Discuss the various products available from petroleum industry and identify the appropriate control loop existing in the petrochemical industry.
Electronics and Instrumentation Engineering	19EI8303	Instrumentation System Design	✓		✓		Design various types of filter circuits and amplifiers, to plot the performance of control valve and to design a data acquisition system.

Electronics and Instrumentation Engineering	19EI8305	Instrumentation and Control in Paper Industry	✓	✓	✓	✓	Summarise various properties of paper and it's testing methods and to demonstrate the consistency of paper through the learnt methodologies.
Electronics and Instrumentation Engineering	19EI8181	Disaster Management	✓		✓	✓	Associate the basic concepts of disaster management in real life and to determine the measures to be taken during environmental disaster.
Electronics and Instrumentation Engineering	19EI8182	Total Quality Management	✓	✓	✓	✓	Recall various quality concepts like employee involvement and performance measurements and to apply the various statistical process control charts to improve the quality of the product.
Electronics and Instrumentation Engineering	19EI8183	Professional Ethics for Engineers		✓	✓		Practice engineering ethics and human values for a moral life and to interpret the responsibilities, professional rights and moralities for enhancement of an organization.
Electronics and Instrumentation Engineering	19EI8184	Principles of Management	✓		✓		Describe the concepts of management, administration and the evolution of management thoughts and explain the different organizational structures and understand the staffing process.

BE MECHANICAL ENGINEERING

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Mechanical Engineering	22MA3104	Fourier Series and Transforms	✓	✓	✓	✓	Develops analytical and computational skills, critical for roles in engineering analysis, research, and data-intensive industries.
Mechanical Engineering	22ME3201	Engineering Thermodynamics	✓	✓	✓	✓	Explores the principles of energy, heat transfer, and thermodynamic cycles, with applications in mechanical systems.
Mechanical Engineering	22ME3202	Engineering Materials and Metallurgy	✓	✓	✓	✓	Focuses on the behavior of materials under stress and strain, including elasticity, plasticity, and failure mechanisms.
Mechanical Engineering	22ME3203	Electrical Drives and Control	✓	✓	✓	✓	Explores the concepts of different types of electrical machines, DC motors, induction motor, conventional and solid-state drives.
Mechanical Engineering	22ME3204	Manufacturing Technology-I	✓	✓	✓	✓	Provides insights into manufacturing processes, fabrication techniques, tools, and manufacturing of plastic components and assembly.
Mechanical Engineering	22ME3251	Fluid Mechanics and Machinery	✓	✓	✓	✓	Understand the behavior of fluid particles under rest and moving conditions. Gain knowledge about the Dimensional and model analysis. Know the design considerations of Turbine.
Mechanical Engineering	22ME3001	Manufacturing Technology Laboratory-I	✓	✓	✓	✓	Able to develop simplified manufacturing processes with the aim of reduction of cost and manpower. The student will be able to

							identify/control the appropriate process parameters, and possible defects of manufacturing processes so as to remove them.
Mechanical Engineering	22ME3002	Computer Aided Modeling Lab	✓	✓	✓	✓	Develop skills on using software for preparing 2D Drawings. Provide the importance of computer aided drawing in engineering society.
Mechanical Engineering	22HE3071	Soft Sk Mechanical Engineering ills -2	✓	✓	✓	✓	-Training programs - To encompassing communication, teamwork, adaptability, and empathy, are pivotal in fostering professional success and cultivating meaningful relationships, bridging the gap between technical expertise and interpersonal effectiveness.
Mechanical Engineering	22MC3091	Essence of Indian Traditional Knowledge	✓	✓	✓	✓	Focuses on creating detailed technical drawings of machine components using conventional and CAD techniques, emphasizing precision and standards.
Mechanical Engineering	22HE4101	IPR and Start-ups	✓	✓	✓	✓	Explores intellectual property rights, patent filing, and strategies for establishing and managing startups.
Mechanical Engineering	22ME4201	Kinematics of Machinery	✓	✓	✓	✓	Understand the purpose of kinematics, Kinematic joint and mechanism and to study the relative motion of parts in a machine without taking into consideration the forces involved. Understand applications of different types of gears and gear profiles and its efficiency and gear trains. Understand principles of friction applied to screw threads, clutches, brakes, belt and rope drives.
Mechanical Engineering	22ME4202	Hydraulic and Pneumatic Systems	✓	✓	✓	✓	To impart knowledge of the hydraulic and pneumatic systems components

Mechanical Engineering	22ME4203	Manufacturing Technology – II	✓	✓	✓	✓	able to develop simplified manufacturing processes with the aim of reduction of cost and manpower. The student will be able to identify/control the appropriate process parameters, and possible defects of manufacturing processes so as to remove them.
Mechanical Engineering	22ME4204	Thermal Engineering	✓	✓	✓	✓	Determination of thermal conductivity of conduction apparatus, Calculation of effectiveness of heat exchangers.
Mechanical Engineering	22ME4251	Strength of Materials	✓	✓	✓	✓	Study the principles of simple stress, strain and deformation in components, assess stresses and deformations through mathematical models of beams and gain knowledge about deflections on beams.
Mechanical Engineering	22ME4001	Manufacturing Technology Laboratory-II	✓	✓	✓	✓	able to develop simplified manufacturing processes with the aim of reduction of cost and manpower. The student will be able to identify/control the appropriate process parameters, and possible defects of manufacturing processes so as to remove them.
Mechanical Engineering	22ME4002	Thermal Engineering Lab	✓	✓	✓	✓	Determination of thermal conductivity of conduction apparatus, Calculation of effectiveness of heat exchangers.
Mechanical Engineering	22ME4003	Mini Project	✓	✓	✓	✓	Skill Development - able to develop skills on various tasks of the project and standard procedures, to get hands on training in the fabrication of one or more components of a complete working models.
Mechanical Engineering	22HE4071	Soft Skills -3	✓	✓	✓	✓	-Training programs - To encompassing communication, teamwork, adaptability, and empathy, are pivotal in fostering professional

							success and cultivating meaningful relationships, bridging the gap between technical expertise and interpersonal effectiveness.
Mechanical Engineering	21ME5201	Dynamics of Machines	✓	✓	✓	✓	Study the method of static force analysis and dynamic force analysis of mechanisms and flywheel. Study the undesirable effects of unbalances in rotors and engines. Learn the concept of forced vibratory systems and their analysis.
Mechanical Engineering	21ME5202	Heat and Mass Transfer	✓	✓	✓	✓	Understand and apply the concepts of conduction, convection, radiation, heat transfer and mass transfer phenomena in food processing.
Mechanical Engineering	21ME5203	Design of Machine Elements	✓	✓	✓	✓	Study the design function in mechanical engineering, different steps involved in designing and the relation of design activity with manufacturing activity.
Mechanical Engineering	21ME5204	Automobile Engineering	✓	✓	✓	✓	Develop a strong base for understanding future developments in the automobile industry.
Mechanical Engineering	21ME5251	Machine Drawing	✓	✓	✓	✓	Understand the shape and structure of different types of screws, keys and Couplings. To impart the knowledge of limits, fits and tolerances, orthographic-sectional and assembly drawing procedures. To provide the practice and develop the detailed mechanical components drawing.
Mechanical Engineering	21ME5001	Dynamics Lab	✓	✓	✓	✓	learn the concepts of generalized forces and the Principle of Virtual Work, acquire concepts of static and dynamic mass balancing and flywheels.

Mechanical Engineering	21ME5002	Heat Transfer Lab	✓	✓	✓	✓	determine the temperature distribution, measurement of emissivity, thermocouple calibration
Mechanical Engineering	21HE5071	Soft Skills - I	✓	✓	✓	✓	Modeling software to model engine components and chassis components ,designing the engine and chassis components ,loads and stresses acting on the engine components , assembly and simulation of the engine components
Mechanical Engineering	21HE5072	Design Thinking	✓	✓	✓	✓	Fosters innovation, critical thinking, and entrepreneurial mindset, essential for startups and product development.
Mechanical Engineering	21ME5301	Advanced Foundry Technology	✓	✓	✓	✓	develop problem solving skills among students in various foundry technologies, promote understanding of basic facts and concepts in foundry process while retaining the excitement of foundry industry.
Mechanical Engineering	21ME5302	Advanced Welding Technology	✓	✓	✓	✓	develop basic skill in welding technologies, develop the special processes which require competency & certification to perform the job activity.
Mechanical Engineering	21ME5303	CNC Technology	✓	✓	✓	✓	Impart knowledge in CNC machine tool building, design Tooling and work holding devices.
Mechanical Engineering	21ME5304	Unconventional Machining Processes	✓	✓	✓	✓	learn about various unconventional machining processes, know the various mechanical energy based process parameters and their influence on performance and their applications.
Mechanical Engineering	21ME5305	Hydraulic and Pneumatic systems	✓	✓	✓	✓	To impart knowledge of the hydraulic and pneumatic systems components
Mechanical Engineering	21ME6181	Principles of Management	✓	✓		✓	-Understand the principles and concepts of management. Carry out the process of

							planning and decision making on employment. Perform organizing, departmentation, Recruitment and training in various organizations.
Mechanical Engineering	21ME6201	CAD/CAM	✓	✓	✓	✓	Computers in CAD/CAM and its integration, identify the various geometric modeling techniques &point out an insight of automation process used in manufacturing
Mechanical Engineering	21ME6202	Metrology and Quality Control	✓		✓		To describe the principle of dimensional metrology, various linear and angular measurements & identify the various types of errors using different instruments
Mechanical Engineering	21ME6203	Design of Transmission Systems		✓	✓	✓	Acquire knowledge for the selection of various flexible elements like belt and chain drives. study design and analysis of parallel and non-intersecting type of gear drives. Acquire the knowledge on design of gear boxes.
Mechanical Engineering	21ME6001	CAD/CAM Lab	✓		✓	✓	To acquire practical experience in using 2D drafting and 3D modeling software, To study the features of CNC Machine Tools.
Mechanical Engineering	21ME6002	Metrology and Measurements Lab	✓	✓		✓	To describe the principle of dimensional metrology, various linear and angular measurements & identify the various types of errors using different instruments
Mechanical Engineering	21HE6071	Soft Skill-II	✓	✓		✓	Training programs - To encompassing communication, teamwork, adaptability, and empathy, are pivotal in fostering professional success and cultivating meaningful relationships, bridging the gap between technical expertise and interpersonal

							effectiveness.
Mechanical Engineering	21HE6072	Intellectual Property Rights (IPR)		✓	✓	✓	Explores intellectual property rights, patent filing, and strategies for establishing and managing startups.
Mechanical Engineering	21ME6701	Internship / Industrial Training	✓	✓	✓	✓	Training program to industry environment and work there as trainees.
Mechanical Engineering	21ME6301	Refrigeration and Air Conditioning	✓		✓	✓	learn the working principle of Refrigeration & Air conditioning systems, recognize various components and accessories of refrigeration systems.
Mechanical Engineering	21ME6302	Advanced I.C. Engines		✓	✓	✓	Understand the combustion phenomena in IC engines, understand the significance of alternative fuels and their feasibility.
Mechanical Engineering	21ME6303	Design of Heat Exchangers	✓		✓	✓	Expose the students about the classification of heat exchangers and its applications, know the factors considered for design of heat exchangers.
Mechanical Engineering	21ME6304	Gas Dynamics and Jet Propulsion	✓	✓		✓	understand the difference between incompressible and compressible flow, understand the concept of nozzle and diffuser in flow through variable area duct..
Mechanical Engineering	21ME6305	Energy Conservation and Management		✓		✓	To inculcate among the students systematic knowledge and skill about assessing the energy efficiency, energy auditing and energy management. Students will be able to apply the knowledge of the subject to calculate the efficiency of various thermal utilities.
Mechanical Engineering	21ME6401	Renewable Energy Sources	✓		✓	✓	Discuss on availability of renewable energy sources, Understand and analyze the energy conservation methods,Infer the Concepts of energy management system and role of energy manager, Acquire Skills and techniques

							required to implement energy audit, Implement techniques required for energy audit.
Mechanical Engineering	21ME6204	Lean Manufacturing	✓	✓		✓	study about the deeper understanding methodologies of Lean manufacturing
Mechanical Engineering	21ME6205	Modern Robotics	✓	✓		✓	To understand the functions of the basic components of a Robot,To study the use of various types of End Effectors and Sensors, To impart knowledge in Robot Kinematics and Programming, To learn Robot safety issues and economics, To impart knowledge in Robot cell design.
Mechanical Engineering	21ME6206	Energy Conservation in Industries		✓	✓	✓	To inculcate among the students systematic knowledge and skill about assessing the energy efficiency, energy auditing and energy management. Students will be able to apply the knowledge of the subject to calculate the efficiency of various thermal utilities.
Mechanical Engineering	21ME6207	Energy Storage Devices	✓		✓	✓	To understand the various types of energy storage devices and technologies and them comparison.
Mechanical Engineering	21ME6208	Ergonomics in Design	✓	✓	✓	✓	Study the aesthetics applicable to manufacturing and product
Mechanical Engineering	21ME6209	Advances in Composite Materials	✓			✓	To understand the principles, matrices, fabricating types and characteristics of MMC,
Mechanical Engineering	19ME7201	Finite Element Analysis	✓	✓	✓		Students should be able to simulate physical phenomena and thereby reduce the need for physical prototypes, while allowing for the optimization of components as part of the design process of a project.

Mechanical Engineering	19ME7202	Power Plant Engineering	✓	✓	✓		The demand of energy directly goes in relation with our quality of life and understanding of various types of energy available in the world, their quality and availability, various conservation measures and the cost of electricity in different sources.
Mechanical Engineering	19ME7001	Computer Aided Analysis Lab		✓	✓	✓	Student can able to develop the skills in proper modeling, meshing, and setting up material properties, loads, and constraints for computer simulation and analysis.
Mechanical Engineering	19ME7002	Comprehension Lab		✓	✓		Understand and comprehend any given problem related to Mechanical Engineering field and apply knowledge to real time industrial solutions.
Mechanical Engineering	19ME7901	Project Work – Phase I			✓	✓	Explore the skills and knowledge developed in developing a system with technically, economically, and environmentally feasible.
Mechanical Engineering	19ME8201	Engineering Economics and Cost Estimation		✓	✓	✓	Apply knowledge of mathematics, economics, and engineering principles to solve engineering problems and to understand the concept of value engineering and time value of money using engineering economy factors and formulas
Mechanical Engineering	19ME8901	Project Work – Phase II		✓	✓		Explore the skills and knowledge in developing a system with technically, economically, and environmentally feasible.

Mechanical Engineering	19ME7301	Design of Jigs, Fixtures and Press Tools		✓	✓	✓	Basic knowledge about Jiga, Fixture Press tolls for mass production applications.
Mechanical Engineering	19ME7302	Tool and Die Design	✓	✓	✓	✓	Enhance the knowledge and applications on Tool and die.
Mechanical Engineering	19ME7303	Mechatronics	✓				Enhance the knowledge on pneumatic, electro pneumatic, PLC and its applications
Mechanical Engineering	19ME7304	Composite materials		✓	✓	✓	Delivers the various types of Composites like MMC, PMC, CMC and its combination and applications.
Mechanical Engineering	19ME7305	Industrial Robotics and Expert Systems	✓	✓			Understand the functions of the basic components of a robot and to Gain knowledge of Robot sensors.
Mechanical Engineering	19ME7306	Operations Research	✓	✓			Apply operations research techniques like Linear Programming problems in industrial optimization problems and to Apply the concepts of PERT and CPM for decision making and optimally managing projects.
Mechanical Engineering	19ME7307	Industrial Engineering		✓	✓	✓	Apply the Industrial Engineering concepts in the industrial environment and to manage and implement different concepts involved in methods study and understanding of work content in different situations.
Mechanical Engineering	19ME7308	Industrial Safety Engineering		✓	✓	✓	Apply the philosophies behind industrial accidents and to apply the hierarchical levels

							in a safety organization.
Mechanical Engineering	19ME7309	Maintenance Engineering			✓	✓	Understand the maintenance planning functions and to gain knowledge about methods and instruments for CM.
Mechanical Engineering	19ME7310	Metrology and Non Destructive Testing		✓		✓	Enhance the knowledge on Measuring systems and NDT methods.
Mechanical Engineering	19ME8181	Total Quality Management	✓	✓	✓	✓	Understand quality concepts and philosophies of TQM apply TQM principles and concepts of continuous improvement.
Mechanical Engineering	19ME8182	Entrepreneurship Development and BusinessConcepts		✓			Motivate the students to become an entrepreneur, and its merits and demerits.
Mechanical Engineering	19ME8183	Logistics and Supply Chain Management	✓	✓	✓		Understand the concept of logistics and supply chain management.
Mechanical Engineering	19ME8301	Production Planning andControl	✓	✓	✓	✓	Understand the major production planning and control activities and identify qualitative and quantitative forecasting techniques and their influence on production planning and control.
Mechanical Engineering	19ME8302	Heating, Ventilation andAir Conditioning Systems	✓				Able to understand the types of HVAC systems and to calculate the cooling and heating loads for various air conditioning rooms.

Mechanical Engineering	19ME7401	Additive Manufacturing Techniques		✓	✓		Enhance the knowledge on 3D printing SLS, SLA and other additive manufacturing methods.

BE MECHATRONICS ENGINEERING

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Mechatronics Engineering	22HE1072	Entrepreneurship & Innovation	✓		✓	✓	To transform ideas into tangible solutions, driving economic growth, and shaping the landscape of industries and societies.
Mechatronics Engineering	22HE1073	Introduction to Soft Skills	✓	✓	✓		Training programs
Mechatronics Engineering	22HE1071	Universal Human Values		✓		✓	To inherent dignity, worth, and rights of every individual, regardless of differences in background, beliefs, or circumstances.
Mechatronics Engineering	22HE2071	Design Thinking	✓		✓		To fosters a holistic approach to problem-solving, emphasizing empathy, creativity, and iterative prototyping to generate user-centered solutions that address complex challenges effectively.
Mechatronics Engineering	22HE2072	Soft Skills and Aptitude -I	✓		✓	✓	Training programs

Mechatronics Engineering	22PH2102	Applied Mechanics	✓	✓	✓	✓	The aim of an Applied Mechanics course is to provide students with a strong foundation in the principles and applications of mechanics, preparing them for further study or careers in engineering and related fields.
Mechatronics Engineering	22MT2251	Fundamentals of Mechatronics		✓		✓	To apply the basic laws used in Electrical circuits and the different components, To impart knowledge on construction and working of DC & provide knowledge on the fundamentals ofsemiconductor devices and their applications
Mechatronics Engineering	22MT3201	Industrial Motor Control	✓	✓		✓	on training for automatic starters of electrical motors & impart knowledge on control circuits for jogging and reversing operations
Mechatronics Engineering	22MT3202	Solid and Fluid Mechanics		✓	✓	✓	The resistance of an element is defined as its ability to resist efforts and forces applied without breaking, permanent deformation or acquire deterioration.
Mechatronics Engineering	22MT3203	Digitronics	✓		✓	✓	Field of electronics involving the study of digital signals and the engineering of devices that use or produce them. This is in contrast to analog electronics and analog signals.
Mechatronics Engineering	22MT3251	Manufacturing Process		✓	✓		To know the fundamentals and various methods of manufacturing process
Mechatronics Engineering	22HE3071	Soft Skills and Aptitude -II	✓		✓	✓	Training programs
Mechatronics Engineering	22MT3001	Industrial Motor Control Lab		✓		✓	To provide hands-on training for automatic starters of electrical motors & impart knowledge on control circuits for jogging and reversing operations
Mechatronics Engineering	22MT3002	Solid and Fluid Mechanics Lab		✓	✓		Solid and Fluid Mechanics enhance employability by developing analytical skills in material behavior and fluid dynamics, opening

							career paths in engineering, aerospace, construction, and energy sectors.
Mechatronics Engineering	22MT3072	Home Automation	✓		✓	✓	Improves employability by fostering skills in smart systems, IoT, and energy management, leading to careers in technology, installation, and sustainable home innovation industries.
Mechatronics Engineering	22MT4201	Processor and controller	✓	✓		✓	To impart knowledge on the basics of microcomputer systems & to introduce commonly used peripheral / interfacing ICs and simple applications to the students
Mechatronics Engineering	22MT4202	Metrology and Measurements	✓		✓	✓	study basic principles of measurements,learn about the various linear & angular measuring equipments.
Mechatronics Engineering	22MT4203	Theory of Machines	✓	✓	✓		Engineering science which deals with the study of relative motion between various elements of a machine and the forces which act on them.
Mechatronics Engineering	22MT4251	Sensors and Transducers		✓	✓		To learn the fundamentals of measurements and classify the transducers and instruments & impart knowledge in selection of suitable sensor for temperature, pressure, vacuum and flow measurement
Mechatronics Engineering	22MT4001	Processor and controller Laboratory	✓	✓			Employability by developing skills in embedded systems, automation, and electronics, creating opportunities in robotics, IoT, manufacturing, and technology-driven industries.
Mechatronics Engineering	22MT4002	CAD Laboratory	✓		✓	✓	Computers in CAD and its integration, identify the various geometric modeling techniques & point out an insight of automation process used in manufacturing
Mechatronics Engineering	22HE4071	Soft Skills and Aptitude -II		✓	✓		Training programs
Mechatronics Engineering	21MT5201	Machine Design	✓		✓	✓	To familiarize the fundamentals involved in design process & To learn fundamental

							approaches to failure prevention for static and repeated loading
Mechatronics Engineering	21MT5202	Industrial Automation and Control		✓	✓		Study the architecture, Hardware and Software wiring of programmable logic controller, read the fundamentals of PLC programming instructions & explain the PLC programs to perform specified discrete sequential control operations
Mechatronics Engineering	21MT5203	Control of Mechatronics Systems	✓		✓	✓	Constructional details, principle of operation, starters and speed control of Electrical Machines& identify the control circuit components used in electrical circuit
Mechatronics Engineering	21IT5251	Object Oriented Programming		✓	✓		understand about UML diagrams and case tools ,Analyze and design software requirements in efficient manner. Construct various UML models using the appropriate notation using the Rational Software Suite.
Mechatronics Engineering	21HE5071	Soft Skills-I	✓		✓	✓	Training programs
Mechatronics Engineering	21MT5001	Computer Aided Machine Drawing Laboratory	✓	✓	✓		Computers in CAD/CAM and its integration, identify the various geometric modeling techniques & point out an insight of automation process used in manufacturing
Mechatronics Engineering	21MT5002	Industrial Automation and Control Laboratory -I		✓		✓	Study the architecture, Hardware and Software wiring of programmable logic controller, read the fundamentals of PLC programming instructions & explain the PLC programs to perform specified discrete sequential control operations
Mechatronics Engineering	21MT6181	Total Quality Management		✓		✓	Acquire knowledge on TQM concepts,To Acquire knowledge on customer Satisfaction, Motivation etc & Develop skills to use TQM tools for domain specific applications"

Mechatronics Engineering	21MT6201	Design of Mechatronics Systems	✓			✓	To impart knowledge about mechatronics design process, impart knowledge about System modeling & familiarize the design of mechatronics system with real time interfacing
Mechatronics Engineering	21MT6202	CNC Technology	✓	✓	✓	✓	To understand evolution and principle of CNC machine tools &the structure and parts of CNC machine tools & describe constructional features of CNC machine tools, drives and positional transducers
Mechatronics Engineering	21MT6251	Vetronics	✓	✓		✓	To impart knowledge about the evolution of electronics in automobile and its emission standard, classify various ignition and injection system & identify various sensors and actuators used in automobiles
Mechatronics Engineering	21MT6701	Inplant Training/ Internship		✓	✓	✓	Skill development
Mechatronics Engineering	21HE6071	Soft Skill II	✓	✓		✓	Training programs
Mechatronics Engineering	21MT6301	Embedded System	✓		✓	✓	Learning basics of Organizational and Architectural issues of a Microcontroller and Programming Techniques used in embedded systems.
Mechatronics Engineering	21MT6001	CNC Laboratory	✓	✓		✓	Enhances employability by equipping learners with in-demand skills in programming, operating CNC machines, boosting opportunities in manufacturing, engineering, and automation industries.
Mechatronics Engineering	21MT6002	Industrial Automation and Control Laboratory -II	✓	✓	✓	✓	By providing expertise in automated systems, robotics, and control technologies, meeting industry demands and creating career opportunities in manufacturing, energy, and smart technologies

Mechatronics Engineering	19MT7201	Virtual Instrumentationand Human Machine Interface	✓	✓	✓	✓	Employability by developing skills in system monitoring, control, and data visualization, creating opportunities in automation, robotics, and process industries.
Mechatronics Engineering	19MT7202	Machine Vision Systems	✓	✓	✓	✓	Comprehensive understanding of machine vision principles and techniques, along with the ability to design, implement, and evaluate machine vision systems for a wide range of applications.
Mechatronics Engineering	19MT7251	Industrial Robotics		✓	✓	✓	-The evolution of robots and its anatomy, describe the various kinematics and inverse kinematics of robot motions,To illustrate the principle of robot end effectors & acquire knowledge about different types of sensors and its applications
Mechatronics Engineering	19MT7001	CAE Laboratory	✓	✓		✓	Computers in CAD/CAM and its integration, identify the various geometric modeling techniques & point out an insight of automation process used in manufacturing
Mechatronics Engineering	19MT7901	Project Phase– I	✓	✓	✓	✓	Create innovation ideas and making Prototype/Working models
Mechatronics Engineering	19MT7301	Mobile Robotics	✓	✓		✓	To prepare students for careers in robotics research, development, and engineering, as well as related fields such as artificial intelligence, automation, mechatronics, and computer vision.
Mechatronics Engineering	19MT7303	Medical Mechatronics					To prepare students for careers in biomedical engineering, medical device design and development, healthcare technology innovation, research and development, and related fields where mechatronic systems play a crucial role in improving patient care and advancing medical science.

Mechatronics Engineering	19MT7305	Factory Automation	✓	✓	✓	✓	To impart knowledge prepare students for careers in manufacturing engineering, automation engineering, control systems engineering, robotics engineering, and related fields, where expertise in factory automation is essential for optimizing production processes, improving quality, and maintaining competitiveness in the global marketplace.
Mechatronics Engineering	19MT8901	Project Phase– II	✓	✓	✓	✓	Create innovation ideas and making Prototype/Working models
Mechatronics Engineering	19MT8301	Rapid Prototyping and Reverse Engineering	✓	✓	✓	✓	The objectives of a course on Rapid Prototyping and Reverse Engineering typically aim to equip students with the knowledge and skills necessary to efficiently develop prototypes of products and components, as well as to understand and replicate existing physical objects through reverse engineering.
Mechatronics Engineering	19MT8307	Industrial Diagnostics and Maintenance Techniques	✓	✓	✓	✓	The objectives of a course on Industrial Diagnostics and Maintenance Techniques typically aim to provide students with the knowledge and skills necessary to effectively diagnose, troubleshoot, and maintain industrial equipment and machinery.
Mechatronics Engineering	19MT8302	Industrial IoT	✓	✓	✓	✓	To prepare students for careers in industrial automation, manufacturing engineering, IoT development, data analytics, cybersecurity, and related fields, where expertise in industrial IoT is increasingly in demand for improving operational efficiency, reducing costs, and driving innovationEmployability-
Mechatronics Engineering	19MT8303	Artificial Intelligence for Mechatronics Engineering	✓	✓	✓	✓	The outcomes are designed to equip students with the knowledge, skills, and practical experience needed to apply AI techniques to

							mechatronic systems.
Mechatronics Engineering	19MT8181	Principles of Management	✓	✓	✓	✓	The outcomes generally focus on providing students with a foundational understanding of management theory, principles, and practices.
Mechatronics Engineering	22MT2251	Fundamentals of Mechatronics				✓	Focuses on fundamental concepts, operating principles, application considerations and relevant practical issues that arise in the selection and design of mechatronics components and systems
Mechatronics Engineering	19MT7201	Virtual Instrumentation and Human Machine Interface	✓	✓	✓	✓	A virtual instrumentation system is a software that is used by the user to develop a computerized test and measurement system, for controlling an external measurement hardware device from a desktop computer, and for dis- playing test or measurement data on panels in the computer screen.
Mechatronics Engineering	19MT7202	Machine Vision Systems	✓	✓	✓	✓	Machine vision is the ability of a computer to see; it employs one or more video cameras, analog-to-digital conversion (ADC) and digital signal processing (DSP) and the resulting data goes to a computer or robot controller.
Mechatronics Engineering	19MT7251	Industrial Robotics	✓	✓	✓	✓	To outline the evolution of robots and its anatomy and to describe the various kinematics and inverse kinematics of robot motions.
Mechatronics	19MT7001	CAE Laboratory		✓	✓		Student can able to develop the skills in proper modeling, meshing, and setting up material

Engineering							properties, loads, and constraints for computer simulation and analysis.
Mechatronics Engineering	19MT7901	Project Phase – I	✓	✓	✓	✓	Explore the skills and knowledge in developing a system with technically, economically, and environmentally feasible.
Mechatronics Engineering	19MT8901	Project Phase – II	✓	✓	✓	✓	Explore the skills and knowledge in developing a system with technically, economically, and environmentally feasible.
Mechatronics Engineering	19MT7301	Mobile Robotics		✓		✓	A mobile robot is an automatic machine that is capable of locomotion and Mobile robotics is usually considered to be a subfield of robotics and information.
Mechatronics Engineering	19MT7302	Textile Automation	✓	✓	✓	✓	Summarize the Basic concepts and list the Basic processing of the Textile Technology and to familiarize with the Basics of Spinning and to interpret the Basics of Weaving Process.
Mechatronics Engineering	19MT7303	Medical Mechatronics		✓	✓	✓	Modern engineering and information technology tools for engineering practice and select different sensors and transducers for biomedical instrumentation.
Mechatronics Engineering	19MT7304	Disaster Management	✓	✓	✓	✓	Understand the relationship between vulnerability, disasters, disaster prevention and risk reduction and to explain approaches of psychological impact of disasters.
Mechatronics Engineering	19MT7305	Factory Automation	✓	✓	✓	✓	Factory automation is the incorporation of automation from end-to-end manufacturing

							processes and environments, automation often leverages technologies such as pneumatic systems, hydraulic systems, and robotic arms to create a more complex system.
Mechatronics Engineering	19MT7401	Project Management	✓	✓	✓	✓	Observe how to plan and manage the projects at each stage of the Software Development Life cycles, learn the successful projects that support organization's Strategic Goals and acquire the knowledge about the activities and to successfully complete and close the Software Projects.
Mechatronics Engineering	19MT8301	Rapid Prototyping and Reverse Engineering	✓	✓	✓	✓	The Rapid prototyping process used is Fus Deposition Modeling (FDM) system. It al describes the step-by-step procedure for maki the prototype (ABS Pattern) as well as the hardware a software used for making the prototype mod Aluminum Casting.
Mechatronics Engineering	19MT8302	Industrial IoT	✓	✓	✓	✓	Describe about IoT and its applications and us of networks, communication, and data management in IoT.
Mechatronics Engineering	19MT8303	Artificial Intelligence for Mechatronics Engineering	✓	✓	✓	✓	Solve the given problem using back propagation algorithm which is used as a decision support tool. Identify problems that are amenable to solution by neural networksand apply Genetic Algorithm to various optimization problems.

Mechatronics Engineering	19MT8304	MEMS and Nano Technology	✓	✓	✓	✓	MEMS (Micro-Electro-Mechanical Systems) is a specialized field referring to technologies that are capable of miniaturizing existing sensor, actuator, or system products. Nanotechnology is a growing field that uses the unique properties of ultra-small-scale materials to an advantage.
Mechatronics Engineering	19MT8305	Information System for Engineers	✓	✓	✓	✓	Information Systems (IS) Engineers fill a critical role for any organization that uses data and data use is increasingly vital to any business, organization, or agency. Computing and digital storage capabilities have forever changed the face of the enterprise.
Mechatronics Engineering	19MT8306	Machineries in Agriculture		✓	✓		The modern farm machinery has upgraded the agricultural industry for the best and most used machinery are Combine or Combine Harvester, Rotavator or Rotary Tiller, Plough or Plow, Tractor Trailer, Power Harrow, Leveler, water bowser, ripper machine, and disc harrow.
Mechatronics Engineering	19MT8307	Industrial Diagnostics and Maintenance Techniques	✓	✓	✓	✓	Maintenance engineering is the discipline and profession of applying engineering concepts for the optimization of equipment, procedures, and departmental budgets to achieve better maintainability, reliability, and availability of equipment.
Mechatronics Engineering	19MT8308	Engineering Economics and Cost			✓	✓	Acquire the knowledge of major types of costing methods and budgeting operations that support engineering cost analysis and

		Analysis					project/operations planning and control.
Mechatronics Engineering	19MT8181	Principles of Management	✓	✓	✓	✓	Impart knowledge about functions of management and manager in an organization and to familiarize about planning and management objectives.
Mechatronics Engineering	19MT8182	Professional Ethics in Engineering	✓	✓	✓	✓	Recognize, list, and describe ethical issues and professional importance to the engineer and apply function effectively as an individual, and in a multi-disciplinary environment.

BTech INFORMATION TECHNOLOGY

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	**Course Code**	**Name of the Course**	**Needs**				**Description**
			Global	**National**	**Regional**	**Local**	
Information Technology	22CS1151	Problem solving using C programming	✓	✓	✓	✓	Programming basics and the fundamentals of C, Data types in C,Mathematical and logical operations, Arranging data in arrays, Implementing pointers, File management and dynamic memory allocation
Information Technology	22IT3201	Data Structures	✓	✓	✓	✓	Understand Linear and Non Linear Data structures, Able to apply sorting and searching algorithms.Understand Graph traversl techniques.

Information Technology	22IT3202	Operating System	✓	✓	✓	✓	Understand Process Scheduling, Memory management and device management techniques.
Information Technology	22IT3203	Digital Principles and Computer Organization	✓	✓	✓	✓	Able to Simplify boolean functions using different methods.Design and implement combinational logic circuits and sequential logic circuits.
Information Technology	22IT3251	Java Programming	✓	✓	✓	✓	Develop event driven programming and implement polymorphism, exception handling and multi threading in java. Ability to access data from a DB with Java programs.Able to create client server communications for data sharing using java.
Information Technology	22IT3252	Data Visualization	✓	✓	✓	✓	Understand the data collection methods and different distribution in statistics, Understand the exploratory data analysis using visualization
Information Technology	22IT3001	Operating System Laboratory	✓	✓	✓	✓	Compare the performance of various CPU Scheduling Algorithm, Analyze the performance of the various page replacement algorithms, Visualize paging with other techniques and synchronization
Information Technology	22IT3002	Digital Principles and Computer Organization Laboratory	✓	✓	✓	✓	Analyse, design and implement combinational logic circuits., Synchronous sequential logic circuits, Shift Registers
Information Technology	22HE3071	Soft Skills and Aptitude-II	✓	✓	✓	✓	Students would opt for alternate methods to solve the problems rather than conventional methods, Students will heighten their awareness of correct usage of English grammar in writing and speaking

Information Technology	22IT3003	Data Structures Laboratory	✓	✓	✓	✓	Able to determine algorithm correctness and time efficiency class.Identify and analyze various criteria and specifications appropriate to new problems. develop efficient algorithms for the new problem with suitable designing techniques
Information Technology	22MC3191	Essence of Indian Traditional Knowledge	✓	✓	✓	✓	Identify the concept of Traditional knowledge and its importance, Explain the need and importance of protecting traditional knowledge, Itihas and Dharma Shastra, Interpret the concepts of Intellectual property to protect the traditional knowledge.
Information Technology	22IT4201	Design and Analysis of Algorithms	✓	✓	✓	✓	Derive and solve recurrences describing the performance of divide-and-conquer algorithms, Analyze the different algorithm design techniques for a given problem, Solve complex problems using backtracking .branch and bound techniques
Information Technology	22IT4202	Computer Networks	✓	✓	✓	✓	Understand different types of networks, the data communication system and the purpose of layered architecture . Understand the concepts of Routing methods and Subnetting.Interpret thr mechanism of Congestion control Connection methods . Understand various protocols used for heterogenous Application
Information Technology	22IT4203	Object Oriented Software Engineering	✓	✓	✓	✓	Apply the appropriate SDLC Model for software project, Design Document by applying architecture styles and GUI using UML diagrams, Manage the developers, customers, Project and measure the software metrics
Information Technology	22IT4204	Design Thinking	✓	✓	✓	✓	a strong understanding of the Design Process and how it can be applied in a variety of business settings, Learn

							to research and understand the unique needs of a company around specific challenges, Develop a strong understanding of the Design Process and how it can be applied in a variety of business settings
Information Technology	22IT4251	Web Framework	✓	✓	✓	✓	Analyze the fundamentals of web framework, Implement the concepts in AngularJS, Apply the concept AngularJS - FORMS, INPUTS, AND SERVICES
Information Technology	22IT4252	Database Management System	✓	✓	✓	✓	Gain knowledge about various SQLs and optimization techniques.Understand Normalization.Understand Transaction models
Information Technology	22IT4001	Case Tools Laboratory	✓	✓	✓	✓	Perform Object Oriented analysis and design for a given problem specification, Construct various UML Models using the appropriate notations, Identify and map basic software requirements in UML
Information Technology	22IT4003	Design Thinking Laboratory	✓	✓	✓	✓	Develop a strong understanding of the Design Process and how it can be applied in a variety of business settings, Learn to research and understand the unique needs of a company around specific challenges
Information Technology	22IT4002	Network Laboratory	✓	✓	✓	✓	Implements various protocol using TCP and UDP, Use simulation tools to analyze the performance of various network protocols, Analyze various routing algorithms
Information Technology	22HE4071	Soft Skills and Aptitude -III					Employability - Able to opt for alternate methods to solve the problems rather than conventional methods, heighten their awareness of correct usage of English grammar in writing and speaking

Information Technology	21IT5201	Mobile Computing	✓	✓	✓	✓	Intepret the components of Mobile Operating Systems Understand the various schemes in MAC protocol and demonstrate the functionalities of Mobile IP protocols Understandsthe routing and security issues in Ad hoc and Sensor networks
Information Technology	21IT5202	Computer Networks	✓	✓	✓	✓	Understand different types of networks, the data communication system and the purpose of layered architecture . Understand the concepts of Routing methods and Subnetting.Interpret thr mechanism of Congestion control Connection methods . Understand various protocols used for heterogenous Application
Information Technology	21IT5209	Embedded Systems Design	✓	✓	✓	✓	Describe the architecture and programming of ARM processor, Outline the concepts of embedded programming, Explain the basic concepts of Task and Scheduling
Information Technology	21IT5204	Artificial Intelligence and Machine Learning	✓	✓	✓	✓	-Identify problems that are amenable to solution by AI methodsa nd appropriate AI methods to solve a given problem.Differentiate between supervised, unsupervised, semi-supervised machine learning approaches.Design and carry out case studies of Expert Systems.
Information Technology	21IT5205	Data Warehousing and Data Mining	✓	✓	✓	✓	Understand OLAP and OLTP Models, Understand Data minig algorithms for classifcation and cluster into data groups.
Information Technology	21IT5001	Machine Learning Laboratory					Skill Development: Apply appropriate data sets to the Machine Learning Algorithms and useMachine Learning Algorithms to solve real world problems. Understand evaluation of Learning Algorithms and model selection

Information Technology	21IT5351	Internet and Web Technology	✓	✓	✓	✓	Understand the basics of HTML and CSS. Understand Server side and client side scripting techniques. Gain knowledge on XML and web services.
Information Technology	21IT5352	Advanced Java Programming	✓	✓	✓	✓	Understand OOPs Principle , Packages and interfacing concepts. Understand Eventhandling and able to develop simple applets
Information Technology	21IT5353	C# and .Net Programming	✓	✓	✓	✓	Understand code solutions and compile C# projects within the .NET framework.
Information Technology	21IT5354	Advanced Data Structure	✓	✓	✓	✓	Ability to analyze algorithms and to determine algorithm correctness and time efficiency class, To learn variety of advanced abstract data type (ADT), To understand the concepts data structures and their implementations, To Study different algorithm design and problem solving techniques, Ability to understand the trees and graphs concepts.
Information Technology	21IT5355	Advanced Database Technology	✓	✓	✓	✓	Be familiar withthe basics of Distributed and Parallel Databases Architectures, Be familiar withobject oriented relational databases, Be familiar withXML databases to create Web pages, Understand the concepts of Data Mining and Data warehousing , Understand the applications of Advanced Databases
Information Technology	21IT5356	Ethics and AI	✓	✓	✓	✓	- To gain knowledge of the tools , techniques and ethical issues likely to face the domain of ethical hacking and ethical responsibilities.
Information Technology	21IT5601	Database System	✓	✓	✓	✓	Gain knowledge about various SQLs and optimization techniques.Understand Normalization.Understand Transaction models

Information Technology	21IT5206	Fundamentals of Machine Learning	✓	✓	✓	✓	Understand the basic concepts of Machine Learning, concepts behind supervised learning and their appropriateness, concepts behind unsupervised learning and their appropriateness
Information Technology	21IT6201	Internet of Things	✓	✓	✓	✓	Understands the characteristics and enabling technologies of IOT, Analyze various application protocols related to IOT. Design IOT based simple applications.
Information Technology	21IT6202	Principles of Compiler Design	✓	✓	✓	✓	Create lexical rules and grammars for a programming language.Understand Top-Down and bottom-up SLR parsersing methods. Learn the new code optimization techniques to improve the performance of a program in terms of speed & space.
Information Technology	21IT6309	Predictive Modeling	✓	✓	✓	✓	Understand design, build, evaluate and implement predictive models for various business applications, Compare the underlying predictive modeling techniques
Information Technology	21IT6251	Cryptography and Network Security	✓	✓	✓	✓	Use Symmetric Encryption Techniques and understand Symmetric and Asymmetric Ciphers key algorithm, security mechanisms, hash functions and digital signature. Summarize the intrusion detection and its solutions to overcome the attacks. Interpret Network and Internet security protocols
Information Technology	21IT6252	Data Sciences	✓	✓	✓	✓	Understand the evolution and relevance of Data science in the world today, Explore Spark use cases using the Big Data lifecycle, Gain a Knowledge of Scala Functional Programming language

Information Technology	21IT6001	Internet of Things Laboratory	✓	✓	✓	✓	Analyze real time data stored in a cloud server using data analytics tool. Develop skills to integrate IoT devices. Design and implement solutions to IoT based problemsand Create an IoT based application
Information Technology	21IT6003	Project Based Learning	✓	✓	✓	✓	Understand, plan and execute a Mini Project with team. Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach. Reproduce, improve and refine technical aspects for engineering projects. Work as an individual or in a team in development of technical projects. Communicate and report effectively project related activities and findings.
Information Technology	21HE6071	Soft skill - II	✓	✓	✓	✓	Students will have learnt to keep going according to plan, coping with the unfamiliar, managing disappointment and dealing with conflict, Students will define professional behavior and suggest standards for appearance, actions and attitude in a Business environment
Information Technology	21HE6072	Intellectual Property Rights (IPR)	✓	✓	✓	✓	Skill Development - dentify 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, dentify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing"
Information Technology	21IT6301	Business Intelligence And Analysis	✓	✓	✓	✓	Provide an introduction to the concepts of business intelligence (BI) as components and functionality of information systems.

Information Technology	21IT6302	Information Security	✓	✓	✓	✓	Legal ,ethical and professional issues in Information Security, Technological aspects of information security.
Information Technology	21IT6303	Software Design	✓	✓	✓	✓	Legal ,ethical and professional issues in Information Security, Technological aspects of information security.
Information Technology	21IT6304	Natural Language Processing	✓	✓	✓	✓	To provide the student with knowledge of various levels of analysis involved in NLP, To understand language modeling, To study about semantic analysis and discourse processing, To gain knowledge in automated natural language generation and machine translation, To learn the concepts of retrieving information and resources
Information Technology	21IT6305	Soft Computing	✓	✓	✓	✓	Introduce the ideas of Neural networks and use of heuristics based on human experience,provide the mathematical background for carrying out the optimization associated with neural network learning.
Information Technology	21IT6307	Virtual Reality and Augmented Reality	✓	✓	✓	✓	learn the basic principles of virtual reality applications and get them to know how games differ from desktop apps. It will help students build various types of VR experiences and use Unity to develop VR applications.
Information Technology	21IT6308	Web Development - I	✓	✓	✓	✓	Understand web applications using the Express.js framework and PostgreSQL with Sequelize models, Learn EJS Templating, security, and version control.
Information Technology	21IT6402	Machine Learning for Engineers	✓	✓	✓	✓	Able to recognize the characteristics of machine learning techniques that are useful to solve real-world problems. In a position to read current research papers, understand the issues and the machine learning based solution

							approaches.
Information Technology	21IT6601	Foundation of Data Science	✓	✓	✓	✓	Understand different types of data description for data science process, Gain knowledge on relationships between data, Apply visualization Libraries in Python to interpret and explore data.
Information Technology	21IT6602	Artificial Intelligence and Expert Systems	✓	✓	✓	✓	Identify problems that are amenable to solution by AI methods, appropriate AI methods to solve gaming Problems, Apply the concept of Knowledge Representation for solving problems
Information Technology	21IT6203	Knowledge Engineering	✓	✓	✓	✓	Outline the fundamentals of knowledge engineering using probability concepts, Apply methodologies and modeling for Agent Design and Development, Apply reasoning with ontologies and rules.
Information Technology	21IT6204	Deep Learning	✓	✓	✓	✓	Trace the evolution from basic concepts like McCulloch-Pitts neurons to powerful architectures like multilayer perceptron's with sigmoid activation and gradient descent optimization, understanding their representational capabilities for tackling complex problems, Optimize deep learning models by tackling bias-variance trade-offs, employing regularization techniques, and exploring methods like early stopping, data augmentation, and dropout to improve generalization and prevent overfitting
Information Technology	22IT1152	Introduction to Web Application Development	✓				Understand the development of a client-side browser based web application including its capabilities and limitations. Develop skills in client-side web application development

							technologies. Design a web application using web programming patterns based on data analytics to enhance the front end user experience.
Information Technology	22MA1101	Matrices and Calculus	✓	✓	✓		Study the properties of matrices and the solution of differential equations.
Information Technology	22IT2251	Python programming and Practices	✓	✓	✓	✓	Skill Development - Understand the concepts of tuples, dictionary, identifiers exception handling concepts.
Information Technology	22IT2253	Dynamic Web Design		✓	✓	✓	Skill Development - Students learn how to critically evaluate website quality, learn how to create and maintain quality web pages, learn about web design standards and why they're important, and learn to create and manipulate images.
Information Technology	22MA2103	Differential Equations and Linear Algebra	✓	✓	✓		Study the properties of matrices and the solution of differential equations.
Information Technology	22ME2001	Engineering Practices	✓		✓		Interpret the projections of simple solid objects in plan and elevation.
Information Technology	19IT7201	Distributed and Cloud Computing	✓	✓	✓	✓	Understand the importance of virtualization in distributed computing and analyze the performance of Cloud Computing.
Information Technology	19IT7202	Data Science and Analytics	✓	✓	✓	✓	Develop the ability to build and assess data-based models and execute statistical analyses with professional statistical software.

Information Technology	19IT7203	Software Testing and Quality Assurance	✓	✓	✓	✓	Explore test planning and its management and understand fundamental concepts of software automation.
Information Technology	19IT7001	Distributed and Cloud Computing Laboratory	✓	✓	✓	✓	Understanding the basics, Techniques and Tools for Cloud Computing.
Information Technology	19IT7002	Data Analytics Laboratory	✓	✓	✓	✓	Implementing Map, Reduce Programs for Processing Big Data.
Information Technology	19IT7301	Social Network analysis	✓	✓	✓	✓	Understand about web data and knowledge representation using ontology.
Information Technology	19IT7302	Cyber Forensics		✓	✓	✓	Provide exposure to Forensics Technology and Systems.
Information Technology	19IT7303	Software Documentation	✓	✓	✓		Gain Knowledge of Commonly used Documented Artifacts Concerning Software Testing.
Information Technology	19IT7304	Principles of Management	✓	✓	✓		Learn the Application of the Principles in an Organization.
Information Technology	19IT7305	Software Architecture	✓	✓	✓	✓	Gain knowledge about various Architectural Views.
Information Technology	19IT7306	Green Computing	✓	✓	✓	✓	Provide knowledge to the students to be environmentally responsible and eco- friendly use of computers and their resources.
Information Technology	19IT7401R	Cyber Security	✓	✓	✓	✓	Understand the organizational implications on cyber security.

Information Technology	19IT7003	Professional Readiness For Innovation, Employability and Entrepreneurship	✓	✓	✓	✓	Demonstrate a sound technical knowledge of their selected project topic. Undertake problem identification, formulation and solution. Design engineering solutions to complex problems utilizing a systems approach. Conduct an engineering project. Communicate with engineers and the community at large in written an oral forms. Demonstrate the knowledge, skills and attitudes of a professional engineer.
Information Technology	19IT8301	Graphics and Multimedia	✓	✓			Learn the basics of Computer Graphics System and Line Drawing Algorithms.
Information Technology	19IT8302	Software Process	✓	✓	✓	✓	Develop the skills for particular role in a Software Process and to Practice.
Information Technology	19IT8303	Service Oriented Architecture	✓	✓	✓	✓	Familiar with the web services technology elements for realizing SOA.
Information Technology	19IT8304	Human Computer Interaction	✓	✓	✓		Learn the foundations of Human Computer Interaction.
Information Technology	19IT8305	Mobile Edge Systems		✓	✓		Gain knowledge about Edge computing in Internet of Things.
Information Technology	19IT8306	Information Retrieval Technologies		✓	✓	✓	Acquire knowledge in Query Languages in Information Retrieval.
Information Technology	19IT8307	Block Chain Technology	✓	✓	✓	✓	Understand blockchain's fundamental components, and examine decentralization using blockchain.

Information Technology	19IT8308	Professional Ethics	✓	✓	✓	✓	Provide basic knowledge on industrial standards, exposure to safety, risk benefit analysis.
Information Technology	19IT8309	Deep Learning Techniques.	✓	✓	✓	✓	Understand the basics of deep learning and enable the students to know deep learning techniques to support real-time applications.
Information Technology	19IT8310	Management Information System	✓	✓	✓	✓	Infer the concept of deterministic system and enterprise resource planning in various applications.
Information Technology	19IT8312	Quantum Computing	✓	✓	✓	✓	Understand the quantum algorithms and learn about qubits and gating operations, construct quantum circuits and learn about quantum algorithms.
Information Technology	19IT8901	Project Work - Phase II	✓	✓	✓	✓	Design engineering solutions to complex problems utilising a systems approach.

BTech AGRICULTURAL ENGINEERING

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	**Course Code**	**Name of the Course**	**Needs**				**Description**
			Global	**National**	**Regional**	**Local**	
Agricultural	22AG2252	Principles and Practices	✓	✓	✓	✓	Understand the production practices of crops and usage of farming equipment's from land

Engineering		of Crop Production					preparation to harvesting of the crops
Agricultural Engineering	22AG3203	SOIL TECHNOLOGY	✓	✓	✓	✓	Fundamental knowledge on Soil physical parameters, Permeability – Compaction, Bearing Capacity and types and methods of soil survey and interpretative groupings.
Agricultural Engineering	22AG3251	FLUID MECHANICS AND PUMPS	✓	✓	✓	✓	Able to explain the effect of fluid properties on a flow system. Able to identify type of fluid flow patterns and describe continuity equation. select and analyze an appropriate turbine with reference to given situation in power plants
Agricultural Engineering	22AG3252	ENGINEERING THERMODYNAMICS	✓	✓	✓	✓	Understanding the basic concepts and applying the first, second law of thermodynamics in selected processes, Understanding the application of boilers in food processing.
Agricultural Engineering	22AG3001	UNIT OPERATIONS IN AGRICULTURAL PROCESSING	✓	✓	✓	✓	Knowledge on Fundamentals of various unit operations of Agricultural Processing and material handling equipment.
Agricultural Engineering	22AG3072	SURVEYING AND LEVELLING	✓	✓	✓	✓	Develop the knowledge and skills related to surveying and levelling principles and practice
Agricultural Engineering	22AG2252R	SOIL TECHNOLOGY LABORATORY	✓	✓	✓	✓	Know the techniques to determine various physical and chemical properties of soil that are applicable for agriculture and irrigation by conducting appropriate tests.
Agricultural Engineering	22HE4101	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING	✓	✓	✓	✓	Display competence in oral, written, and visual communication. Handle Engineering Ethics and Human Values.Make effective presentations.Show an understanding of opportunities in the field of communication.Communicate ethically.
Agricultural Engineering	22AG4201	PRINCIPLES AND PRACTICES OF CROP PRODUCTION	✓	✓	✓	✓	Employability through various practices involved in crop production.

Agricultural Engineering	22AG4202	IPR AND START-UPS	✓	✓	✓	✓	- To introduce fundamental aspects of Intellectual property Rights, To understand the concept of Patents and copyrights, To know the concepts of WIPO and GATT, To study the Strategies and legislations of IPR, To analyze Patents, Copyright and related rights by case studies.
Agricultural Engineering	22AG4203	FARM EQUIPMENT AND MACHINERY	✓	✓	✓	✓	Gaining knowledge on usage of various equipment used in the farm for different field operations
Agricultural Engineering	22AG4251	THEORY OF MACHINES	✓	✓	✓	✓	Engineering science which deals with the study of relative motion between various elements of a machine and the forces which act on them.
Agricultural Engineering	22AG4252	HYDROLOGY AND WATER RESOURCES ENGINEERING	✓	✓	✓	✓	understanding of the key drivers on water resources, hydrological processes and their integrated behavior in catchments.
Agricultural Engineering	22AG4001	SOIL AND WATER CONSERVATIONENGINEERING	✓	✓	✓	✓	design appropriate watershed based soil conservation structures and rainwater harvesting systems.
Agricultural Engineering	22HE4071	SOFT SKILLS -3	✓	✓	✓	✓	Gaining knowledge on usage of various equipment used in the farm for different field operations
Agricultural Engineering	21AG5201	FARM MACHINERY AND EQUIPMENT	✓	✓	✓	✓	Gaining knowledge on usage of various equipment used in the farm for different field operations
Agricultural Engineering	21AG5202	REFRIGERATION AND COLD CHAIN MANAGEMENT	✓	✓	✓	✓	Skill development - Understand the various components of refrigeration system and its types, Apply the concept of low temperature storage systems for foods for its shelf life enhancement.
Agricultural Engineering	21AG5203	THEORY OF MACHINES	✓	✓	✓	✓	Engineering science which deals with the study of relative motion between various elements of a machine and the forces which act on them.
Agricultural Engineering	21AG5251	GROUNDWATER AND WELL ENGINEERING	✓	✓	✓	✓	Skill Development- Gaining knowledge on usage of various equipment used in the farm for different field operations, groundwater exploration and

							recharge and Groundwater quality criteria.
Agricultural Engineering	21AG5252	SOIL AND WATER CONSERVATION ENGINEERING	✓	✓	✓	✓	Designing of appropriate watershed based soil
Agricultural Engineering	21AG5001	OPERATION AND MAINTENANCE OF FARM MACHINERY LABORATORY	✓	✓	✓	✓	Skill Development through deep knowledge development in farm equipment experimental works and understanding the various components of farm
Agricultural Engineering	21AG5002	CAD FOR AGRICULTURAL ENGINEERING	✓	✓	✓	✓	Employability opportunity in farm and irrigation equipment manufacturing industries and marketing through design of farm equipments, drip and sprinkler design, green house construction and field layout preparation .
Agricultural Engineering	21AG5301	SYSTEMS ANALYSIS AND SOFT COMPUTING IN AGRICULTURAL ENGINEERING	✓	✓	✓	✓	To introduce the students to the application of systems concept to agricultural engineering problems, planning and management, Soft computing techniques for modeling different problems in the field agricultural engineering
Agricultural Engineering	21AG5302	SUSTAINABLE AGRICULTURE AND FOOD SECURITY	✓	✓	✓	✓	To study the importance of sustainable agriculture for the growing population, various resources required and their sustainability, Importance of science, food security and ecological balance.
Agricultural Engineering	21AG5303	CDM AND CARBON TRADING TECHNOLOGY	✓	✓	✓	✓	To know the basics, importance of clean development mechanism (CDM), To know the concept of carbon trading
Agricultural Engineering	21AG5304	IOT IN AGRICULTURAL SYSTEMS	✓	✓	✓	✓	Understand about e-governance and agricultural systems management.
Agricultural Engineering	21AG5305	ERGONOMICS AND SAFETY IN AGRICULTURAL ENGINEERING	✓	✓	✓	✓	Gain knowledge to improve the performance of the farm systems by improving the human - machine interaction with safety measures.

Agricultural Engineering	21AG6201	HYDROLOGY AND WATER RESOURCES ENGINEERING	✓	✓	✓	✓	understanding of the key drivers on water resources, hydrological processes and their integrated behavior in catchments.
Agricultural Engineering	21AG6202	SOLAR AND WIND ENERGY ENGINEERING	✓	✓	✓	✓	- expose to Solar energy and its applications, wind energy and its applications, alternate energy sources etc.
Agricultural Engineering	21AG6181	PROFESSIONAL ETHICS	✓	✓	✓	✓	Instill Moral and to uphold Social Values in appreciation to the on par rights of others.
Agricultural Engineering	21AG6251	FOOD AND DAIRY ENGINEERING	✓	✓	✓	✓	Skill Development through understanding the experimental works on processing of milk and diary products. Entrepreneurship through establishing a strong base in Milk and diary products
Agricultural Engineering	21AG6252	ICT IN AGRICULTURAL ENGINEERING	✓	✓	✓	✓	Improve agricultural production through ICT tools like sensors , electical and electronic instruments.
Agricultural Engineering	21AG6701	INDUSTRIAL TRAINING	✓	✓	✓	✓	Internship, Industry based problem solving projects.
Agricultural Engineering	21HE6072	INTELLECTUAL PROPERTY RIGHTS (IPR)	✓	✓	✓	✓	Ability to manage Intellectual Property portfolio to enhance the value of the firm.
Agricultural Engineering	19AG7201	AGRICULTURAL EXTENSION	✓	✓	✓	✓	Equip the extension functionaries in latest tools and techniques for participatory decision making and develop an insight into various extension models to enrich the agri - value chain.
Agricultural Engineering	19AG7202R	REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM	✓	✓	✓	✓	Understand the basic principles and compoents of Remote Sensing. Study the applications of remote sensing and GIS.
Agricultural Engineering	19AG7251	PRECISION FARMING AND PROTECTED CULTIVATION	✓	✓	✓	✓	Skill development of production technology for growing agriculture crops, preparing design guidelines of protected structures for different agro climatic conditions, fertigation scheduling

							strategies for various crops ,soil-less/hydroponics cultivation technology.
Agricultural Engineering	19AG7001R	RENEWABLE ENERGY LABORATORY	✓	✓	✓	✓	Learn different primary energy sources and renewable energy sources, Design various solar energy utilized systems, Illustrate the principles of wind, tidal and geothermal energy and its applications, Impart the applications of energy from waste and designing of bio gas plant, Exposure in various direct energy conversion systems
Agricultural Engineering	19AG7002R	REMOTE SENSING AND GIS LABORATORY FOR AGRICULTURAL ENGINEERS	✓	✓	✓	✓	Appraise the characteristics and principles of remote sensing, Implement the elements of photogrammetry
Agricultural Engineering	19AG7901	INNOVATIVE PROJECT	✓	✓	✓	✓	-Validate the technical report and Analyze a methodology to select a project and able to develop a software project.
Agricultural Engineering	19AG7301	POST-HARVEST TECHNOLOGY	✓	✓	✓	✓	Employability through understanding the post harvesting operations & crop processing.
Agricultural Engineering	19AG7302	DAIRY PROCESS TECHNOLOGY	✓	✓	✓	✓	Gain knowledge about Dairy technology and Understand the process of manufacturing of dairy products.
Agricultural Engineering	19AG7303	STORAGE AND PACKAGING TECHNOLOGY	✓	✓	✓	✓	Understanding of various methods of storage and different packaging techniques for food.
Agricultural Engineering	19AG7304R	PROCESS ENGINEERING OF FRUITS AND VEGETABLES	✓	✓	✓	✓	Understand the basics of Post Harvest Technology of fruits and vegetables through their structure and composition. Study the different methods of processing and preservation of fruits and vegetables including drying and dehydration.
Agricultural Engineering	19AG7305	FAT AND OIL PROCESSING	✓	✓	✓	✓	Understand the physical and chemical properties of fats and oils, Remember the mechanical methods for oil extraction, Understand the solvent extraction

Agricultural Engineering	19AG6401	MODERN AGRICULTURAL P RACTICES	✓	✓	✓	✓	Analyze agri business suitations, formulate strategies, implement plans and implement strategic change.
Agricultural Engineering	19AG8312	MICRO IRRIGATION SYSTEMS	✓	✓	✓	✓	Able to design drip and sprinkler irrigation system.
Agricultural Engineering	19AG8301	AGRICULTURAL BUSINESS MANAGEMENT AND ENTREPRENEURSHIP	✓	✓	✓	✓	To understand the concept of entrepreneurship, To know the motivation factors for the entrepreneurs, To analyze the business concepts and projects, To impart knowledge about accounting and various taxes, To understand the government policies towards partnerships in Agricultural Engineering
Agricultural Engineering	19AG8901	PROJECT WORK					Validate the technical report and Analyse a methodology to select a good project and able to work in a team.
Agricultural Engineering	19AG7201	Agricultural Extension	✓	✓	✓	✓	Extension functionaries on the latest developments in the field of agricultural extension
Agricultural Engineering	19AG7202	Remote Sensing and Geographical Information System	✓	✓	✓	✓	Basic principles and concepts of Remote Sensing and GIS as applicable to the multi-facets of Agricultural Engineering
Agricultural Engineering	19AG7251	Precision Farming and Protected Cultivation	✓	✓	✓	✓	Knowledge on the protected all season confined space cultivation strategies for vegetables, fruits and flower crops
Agricultural Engineering	19AG7001R	Renewable Energy Laboratory	✓	✓	✓		Facilitate the students to achieve a clear conceptual understanding of technical and commercial aspects of renewable energy
Agricultural Engineering	19AG7002R	Remote Sensing and GIS Laboratory for Agricultural Engineers	✓	✓	✓		Introduce the principles and basic concepts of Remote Sensing and GIS through intensive hands on training
Agricultural	19AG7901	Innovative Project	✓	✓			Ability to solve a specific problem right from its identification and literature review till the

Engineering							successful solution of the same
Agricultural Engineering	19AG7301	Post-Harvest Technology	✓	✓	✓	✓	Fundamental knowledge in engineering properties of agricultural materials, different Post Harvest operations and processing methods of harvested crops and storage of produces
Agricultural Engineering	19AG7302	Dairy Process Technology	✓	✓	✓	✓	Chemical-physico-thermal properties and their applications
Agricultural Engineering	19AG7303	Storage and Packaging Technology	✓	✓	✓	✓	Food material damage and control measure of losses in storage and estimation of losses
Agricultural Engineering	19AG7304R	Process Engineering of Fruits and Vegetables	✓	✓	✓	✓	Understand the basics of Post Harvest Technology of fruits and vegetables through their structure and composition
Agricultural Engineering	19AG7305	Fat and Oil Processing	✓	✓	✓	✓	Composition, Analysis and Processing of oils and fats
Agricultural Engineering	19AG7401	Urban Agriculture and organic farming	✓	✓	✓	✓	Knowledge to students on the importance of gardening and organic farming
Agricultural Engineering	19AG8301	Agricultural Business Management and Entrepreneurship	✓	✓	✓	✓	Importance of Agri-business management, its characteristics and principles
Agricultural Engineering	19AG8302	On-Farm Water Management	✓	✓	✓	✓	Understand the fundamentals of minor irrigation, its types, operation and maintenance and people's participation
Agricultural Engineering	19AG8303	Intellectual Property Rights	✓	✓	✓	✓	Understanding of the law relating to Intellectual Property and Competition in India.
Agricultural	19AG8304	Agricultural Waste	✓	✓	✓	✓	Understand the energy production potential from agro wastes

Engineering		Management					
Agricultural Engineering	19AG8305	Energy Conservation in Agro based Industry	✓	✓	✓	✓	Acquaint and equip the students in energy auditing in industries and house hold sectors for increasing energy efficiency
Agricultural Engineering	19AG8306	Cooling Technology: Why and How utilized in Food	✓	✓	✓	✓	Basics of processing and preservation technologies required in any processing industries
Agricultural Engineering	19AG8307	Novel Technologies for Food Processing and Self life	✓	✓	✓	✓	Idea generation for the commercial manufacture of such products which ultimately lead our country to an international platform
Agricultural Engineering	19AG8308	Machine Learning for soil and crop management	✓	✓	✓	✓	Knowledge of machine learning, deep learning, digital soil mapping, image processing, and portable sensors for developing an integrated and advanced soil and crop management system
Agricultural Engineering	19AG8309	Special Farm Equipment's	✓	✓	✓	✓	Knowledge about machines / implements for intercultural operation
Agricultural Engineering	19AG8310	Mechanics of Tillage and Traction	✓	✓	✓	✓	Fundamental knowledge of mechanics and dynamics in various tillage implements
Agricultural Engineering	19AG8311	Watershed Hydrology and Management	✓	✓	✓	✓	Fundamental understanding of the hydrologic cycle, the interactions among the hydrosphere, atmosphere and land-use management (forest, agriculture and urban) effects on the amount, timing and quality of water resources
Agricultural Engineering	19AG8312	Micro Irrigation System	✓	✓	✓	✓	Basic conceptual differences in the design of Pressure Irrigation systems viz., Drip, Sprinkler, Surge and Capillary modes

Agricultural Engineering	19AG8313	Agriculture Economics and Farm Management	✓	✓	✓	✓	Fundamental knowledge and basic concepts of Economics and Farm Management
Agricultural Engineering	19AG8901	Project work	✓	✓	✓		Specific problem right from its identification and literature review till the successful solution of the same

BE BIOMEDICAL ENGINEERING

CoursesFocusonGlobal,National,RegionalandLocalNeeds

Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Biomedical Engineering	22HE1071	Universal Human Values	✓	✓	✓	✓	Universal human values are the ethical principles that transcend cultural, religious, and geographical boundaries, serving as the moral compass guiding human behavior. These values, shared by people of diverse backgrounds, promote harmony, empathy, and cooperation in our global society.
Biomedical Engineering	22HE1072	Entrepreneurship & Innovation	✓	✓	✓	✓	Entrepreneurship and innovation are are often mentioned as conditions for economic growth and country growth
Biomedical Engineering	22HE2071	Design Thinking	✓	✓	✓	✓	Design thinking is an iterative, non-linear process which focuses on a collaboration between designers and users. It brings innovative solutions to life based on how real users think, feel and behave. This human-centered design

							process consists of five core stages Empathize, Define, Ideate, Prototype and Test.
Biomedical Engineering	22HE2072	Soft Skills and Aptitude	✓	✓	✓	✓	A soft skills assessment can help illuminate areas where improving your skills can greatly improve the performance of your team, along with your own personal success. It'll also show you which soft skills you're strong in, so you can better understand how to teach those positive behaviors to others.
Biomedical Engineering	22BM3002	Electron Devices and Circuits Laboratory	✓	✓	✓	✓	An ability to design the circuits with basic semiconductor devices (active & passive elements), measuring instruments & power supplies that serves many.
Biomedical Engineering	22BM3001	Biochemistry Laboratory	✓	✓	✓	✓	Biochemistry is a laboratory based science where biochemists can understand and solve the biological problems by using the knowledge of chemical structure and techniques
Biomedical Engineering	22BM3202	Electron Devices and Circuits	✓	✓	✓	✓	Cardiovascular engineering encompasses a wide range of biomedical and engineering projects targeted at understanding the mechanisms, treatments and detection of cardiovascular health, disease, and regeneration.
Biomedical Engineering	22BM3203	Medical Biochemistry	✓	✓	✓	✓	Medical Biochemistry is supported by over forty years of teaching experience, providing coverage of basic biochemical concepts, including the structure and physical and chemical properties of hydrocarbons, lipids, proteins, and nucleotides
Biomedical Engineering	22BM3204	Human Anatomy and Physiology	✓	✓	✓	✓	It is defined as the study of structures in the human body. Anatomy focuses on the description of form, or how body structures at different levels look

Biomedical Engineering	22BM3251	Digital Electronics	✓	✓	✓	✓	Digital electronics is the branch of electronics that deals with the representation and manipulation of data in digital form. It involves the use of devices such as transistors, diodes, and microcontrollers to process and transmit digital signals.
Biomedical Engineering	22BM4202	Pathology and Microbiology	✓	✓	✓	✓	Medical microbiology involves the identification of microorganisms for the diagnosis of infectious diseases and the assessment of likely response to specific therapeutic interventions. Major categories of organisms include bacteria, mycobacteria, fungi, viruses, and parasites.
Biomedical Engineering	22MA3151	Statistics and Numerical MethodsWith R Program	✓	✓	✓	✓	Introduction to numerical methods, or techniques to approximate mathematical processes such as integrals, differential equations, or nonlinear equations when the procedure cannot be solved …
Biomedical Engineering	22BM4203	BioSensors and Measurements	✓	✓	✓	✓	Measurement sensors are a generic term referring to different types of sensors that detect changes in the environment and respond to said changes by outputting some type of signal to another system—usually a data acquisition system.
Biomedical Engineering	22BM4002	BIOSIGNAL CONDITIONING CIRCUITS LABORATORY	✓	✓	✓	✓	To design and implement the circuits to gain knowledge on performance of the circuit and its application. These circuits should also be simulated on Pspice.
Biomedical Engineering	22BM4001	Human Physiology Laboratory	✓	✓	✓	✓	Human Physiology Laboratory course complements and was designed to provide students with hands-on access to modern techniques in human physiological analyses using a mixed course-based research pedagogical approach

Biomedical Engineering	22HE4101	IPR and Startups	✓	✓	✓	✓	Entrepreneurship -It plays a critical role in attracting the investment, as the investors seek the assurance that the startups the unique value proposition is legally secured. Moreover, the IPR facilitates the market expansions and the establish the strong brand identity
Biomedical Engineering	21HE5072	Design Thinking	✓	✓	✓	✓	-Design thinking is an iterative, non-linear process which focuses on a collaboration between designers and users. It brings innovative solutions to life based on how real users think, feel and behave. This human-centered design process consists of five core stages Empathize, Define, Ideate, Prototype and Test.
Biomedical Engineering	22BM4203	BioSensors and Measurements	✓	✓	✓	✓	Measurement Concepts course is designed to provide learners in the sensor industry, including original equipment manufacturers (OEMs), salespeople, distributors, suppliers, and any other interested individuals with a basic understanding of the concepts associated with sensor measurements. Through helpful animations and interactives, learners are introduced to the different sensor families, sensor categories, and the measured attributes.
Biomedical Engineering	21BM5305	INTELLECTUAL PROPERTY RIGHTS	✓	✓	✓	✓	Intellectual property rights (IPR) refers to the legal rights given to the inventor or creator to protect his invention or creation for a certain period of time.
Biomedical Engineering	21BM5001	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	✓	✓	✓	✓	The Microprocessors and Microcontrollers laboratory course assists students in developing their understanding of processor architecture and programming abilities.

Biomedical Engineering	21BM5301	MedicalPhysics	✓	✓	✓	✓	Medical physics deals with the application of the concepts and methods of physics to the prevention, diagnosis and treatment of human diseases with a specific goal of improving human health and well-being
Biomedical Engineering	21BM5251	VIRTUAL INSTRUMENTATION USING LabVIEW	✓	✓	✓	✓	virtual instrumentation graphical development environment, uses symbolic or graphical representations to speed up development. The software symbolically represents functions. Consolidating functions within rapidly deployed graphical blocks further speeds up development.
Biomedical Engineering	21HE5071	Softskill-I	✓	✓	✓	✓	Enable students to get familiarity with this area and to gain adequate knowledge to apply the techniques in solving real world problems.
Biomedical Engineering	21HE6203	Entrepreneurship Development	✓	✓	✓	✓	enhancing the knowledge and skill of entrepreneurs through several classroom coaching and programs, and training. The main point of the development process is to strengthen and increase the number of entrepreneurs.
Biomedical Engineering	21AE6701	Internship Training	✓	✓	✓	✓	Training programs
Biomedical Engineering	21HE6071	Soft Skills - II	✓	✓	✓	✓	Enable students to get familiarity with this area and to gain adequate knowledge to apply the techniques in solving real world problems.
Biomedical Engineering	21BM6301	Biomaterials and Artificial organs	✓	✓	✓	✓	Biomaterials play a crucial role in the design and functionality of artificial organs and medical devices. This course provides an in-depth exploration of the fundamental principles, properties, and applications of biomaterials in the context of artificial organ development. Students will examine the interplay between materials science, biology, and engineering to understand the complex requirements for

							creating biocompatible and functional implants.
Biomedical Engineering	21BM6181	Entrepreneurship Development	✓	✓	✓	✓	enhancing the knowledge and skill of entrepreneurs through several classroom coaching and programs, and training. The main point of the development process is to strengthen and increase the number of entrepreneurs.
Biomedical Engineering	21HE6072	Intellectual Property Rights	✓	✓	✓	✓	Intellectual property rights (IPR) refers to the legal rights given to the inventor or creator to protect his invention or creation for a certain period of time.
Biomedical Engineering	21BM6251	Diagnostic andTherapeutic Equipment-I	✓	✓	✓	✓	Diagnostic and therapeutic equipment are indispensable tools in modern healthcare, facilitating the detection, diagnosis, and treatment of various medical conditions. This course provides an in-depth exploration of the principles, operation, and applications of diagnostic and therapeutic equipment commonly used in clinical settings. Students will examine the underlying technology, safety considerations, maintenance protocols, and clinical relevance of a range of medical devices.
Biomedical Engineering	21BM6001	BiosignalProcessing Laboratory	✓	✓	✓	✓	Skill development tThe biomedical and signal processing lab includes the generation of various biosignal signals, design and realization of biosignal amplifiers, and design and realization of therapeutic devices.
Biomedical Engineering	21BM6202	Radiological Equipments and nuclear Medicine	✓	✓	✓	✓	Nuclear medicine uses small amounts of radioactive material combined with a carrier molecule. This compound is called a radiotracer or radiopharmaceutical. Doctors use nuclear medicine tests to diagnose, evaluate, and treat various diseases. These include cancer, heart disease, gastrointestinal, endocrine, or

							neurological disorders.
Biomedical Engineering	19BM7201	Diagnostic and Therapeutic Equipment- II	✓	✓	✓	✓	Diagnostics are methods followed to detect the presence of a disease in the body. Therapeutics are certain materials like vaccines, proteins or hormones that help in the treatment of a disease.
Biomedical Engineering	19BM7202	Medical Image Processing	✓	✓	✓	✓	Comprises topical, state-of-the-art applications in image analysis
Biomedical Engineering	19BM7251	Hospital Management	✓	✓	✓	✓	Skill development-Hospital management accords in the coordination with medical professionals, pharmacies, paramedical services, nurses, and other nonmedical staff
Biomedical Engineering	19BM7001	Image processing laboratory	✓	✓	✓	✓	The primary objective of this virtual lab is to supplement an undergraduate level course on image processing and enable students to understand the subject better. The lab consists of a diverse set of experiments with objective, theory, assessment
Biomedical Engineering	19BM7002	Diagnostic and Therapeutic Equipment Laboratory	✓	✓	✓	✓	The primary objective of this virtual lab is to supplement an undergraduate level course on image processing and enable students to understand the subject better. The lab consists of a diverse set of experiments with objective, theory, assessment
Biomedical Engineering	19BM7901	Project Work – Phase I	✓	✓	✓	✓	Create innovation ideas and making Prototype/Working models
Biomedical Engineering	19BM7301	Drug Delivery	✓	✓	✓	✓	Drug delivery refers to approaches, formulations, manufacturing techniques, storage systems, and technologies involved in transporting a pharmaceutical compound to its target site to achieve a desired therapeutic effect. Principles related to drug preparation, route of administration.

Biomedical Engineering	19BM7302	IOT Applications in Healthcare	✓	✓	✓	✓	Hospitals use internet connectivity to facilitate patient care. Examples include infusion pumps that connect to analytics dashboards and hospital beds rigged with sensors that measure patients' vital signs. Hospitals also use IoMT devices for asset and inventory management.
Biomedical Engineering	19BM7303	Advanced BioAnalytical And Therapeutic Techniques	✓	✓	✓	✓	Bioanalytical methods typically consist of analyte extraction from biological samples, liquid chromatography to separate analytes of interest from endogenous components and metabolites that may cause a matrix effect or selectivity issue, and MS detection, often in the format of tandem mass spectrometers
Biomedical Engineering	19BM7304	Advanced Bio- signal Processing	✓	✓	✓	✓	Advanced Methods in Biomedical Signal Processing and Analysis presents state-of-the-art methods in biosignal processing, including recurrence quantification analysis, heart rate variability, analysis of the RRI time-series signals, joint time-frequency analyses, wavelet transforms and wavelet packet decomposition, empirical mode decomposition, modeling of biosignals, Gabor Transform, empirical mode decomposition. The book also gives an understanding of feature extraction, feature ranking, and feature selection methods, while also demonstrating how to apply artificial intelligence and machine learning to biosignal techniques.
Biomedical Engineering	19BM7305	Ultrasound in Medicine	✓	✓	✓	✓	An ultrasound scan uses high-frequency sound waves to make an image of a person's internal body structures. Doctors commonly use ultrasound to study a developing fetus (unborn baby), a person's abdominal and pelvic organs,

							muscles and tendons, or their heart and blood vessels.
Biomedical Engineering	19BM8301	Biofluids and Dynamics	✓	✓	✓	✓	Biological fluid Dynamics (or Biofluid Dynamics) involves the study of the motion of biological fluids (e.g. blood flow in arteries, animal flight, fish swimming, etc.). It can be either circulatory system or respiratory systems. Understanding the circulatory system is one of the major areas of research.
Biomedical Engineering	19BM8302	Artificial Intelligence in Healthcare	✓	✓	✓	✓	Healthcare AI systems can analyze patterns in a patient's medical history and current health data to predict potential health risks. This predictive capability enables healthcare providers to offer proactive, preventative care, ultimately leading to better patient outcomes and reduced healthcare costs.
Biomedical Engineering	19BM8303	Medical Informatics	✓	✓	✓	✓	Medical informatics can be concisely defined as “the rapidly developing scientific field that deals with the storage, retrieval, and optimal use of biomedical information, data, and knowledge for problem solving and decision making” (Blois and Shortliffe, 1990).
Biomedical Engineering	19BM8304	Wearable Medical Devices	✓	✓	✓	✓	Wearable technology in healthcare refers to devices that patients attach to their bodies to collect health and fitness data, which they may provide to doctors, health providers, insurers and other relevant parties. Examples include fitness trackers, blood pressure monitors and biosensors.
Biomedical Engineering	19BM8305	Cardiovasular Engineering	✓	✓	✓	✓	Cardiovascular engineering encompasses a wide range of biomedical and engineering projects targeted at understanding the mechanisms, treatments and detection of cardiovascular

							health, disease, and regeneration.
Biomedical Engineering	19BM8306	Rehabilitation Engineering	✓	✓	✓	✓	Rehabilitation engineering is the use of engineering principles to 1) develop technological solutions and devices to assist individuals with disabilities and 2) aid the recovery of physical and cognitive functions lost because of disease or injury.
Biomedical Engineering	19BM8307	Virtual Reality inMedicine	✓	✓	✓	✓	VR is also used to simulate medical procedures and show patients what they can expect before they undergo surgery or other treatments. This can help patients feel more informed and empowered about their care.
Biomedical Engineering	19BM8308	Biophotonics	✓	✓	✓	✓	The term biophotonics denotes a combination of biology and photonics, with photonics being the science and technology of generation, manipulation, and detection of photons, quantum units of light. Photonics is related to electronics and photons. Photons play a central role in information technologies, such as fiber optics, the way electrons do in electronics
Biomedical Engineering	19BM8309	Telemedicine	✓	✓	✓	✓	Telemedicine is a general term that covers all of the ways you and your doctor can use technology to communicate without being in the same room
Biomedical Engineering	19BM8310	BiometricSystems	✓	✓	✓	✓	Biometrics are body measurements and calculations related to human characteristics. Biometric authentication (or realistic authentication) is used in computer science as a form of identification and access control. It is also used to identify individuals in groups that are under surveillance.
Biomedical Engineering	19BM8901	Project Work – Phase II	✓	✓	✓	✓	Employability-Create innovation ideas and making Prototype/Working models

Biomedical Engineering	19BM7201	Diagnostic and Therapeutic Equipment-II	✓	✓	✓	✓	Study various display techniques and use of ultrasonics in variousfields of medicine and various patient monitoring systems and transmission of bio signals using telemetry principles.
Biomedical Engineering	19BM7202	Medical Image Processing		✓	✓	✓	Provide an understanding of medical image analysis theory, techniques, analysis and applications.
Biomedical Engineering	19BM7251	Hospital Management	✓	✓	✓	✓	Hospital management course is essentially a degree where the fields of management, health care services, hospitality, finances, leadership, and administration coordinate accordingly.
Biomedical Engineering	19BM7001	Image Processing Laboratory		✓			Provide the student with the fundamentals of digital image processing be achieved through the project and some selected lab sessions.
Biomedical Engineering	19BM7002	Diagnostic and Therapeutic Equipment Laboratory	✓	✓	✓		Understand thebasics of measuring the parameters in respiratory system, learn measurement techniques ofsensory responses and understand different types and uses of diathermy units.
Biomedical Engineering	19BM7301	Drug Delivery			✓	✓	Introduce the concepts of drug delivery to meet medical challenges.
Biomedical Engineering	19BM7302	IOT Applications in Healthcare	✓	✓	✓	✓	Collection of medical devices and applications thatconnect to healthcare IT systems through onlinecomputer networks.

Biomedical Engineering	19BM7303	Advanced Bio Analytical and Therapeutic Techniques	✓	✓	✓	✓	Introduced to bridge the gap between academics, research, and industry and begins with areview of basic bio analytical technique and an introduction to generalterminologies.
Biomedical Engineering	19BM7304	Advanced Bio signal Processing		✓	✓	✓	The course will introduce advanced statistical methods to deal with these characteristics and to properly model and analyze biomedical signals in various domains of application.
Biomedical Engineering	19BM7305	Ultrasound in Medicine	✓	✓	✓	✓	This course is introduced to bridge the gap between academics, research, and industry.
Biomedical Engineering	19BM7401	First Aid in Emergency Care	✓	✓	✓	✓	Describing emergency procedures and techniques of basic life support for adult, child, or infant victims of airway obstruction, respiratory arrest and/or cardiac arrest.
Biomedical Engineering	19BM7402	Artificial Intelligence in Healthcare	✓	✓	✓	✓	Understand disease prediction, improve patient treatment and assist with making healthcare administrative tasks more efficient.
Biomedical Engineering	19BM7403	Medical Informatics	✓	✓	✓	✓	The course's main aim is to implement knowledge and practical skills to understand the various aspects of the application of healthcare informatics to provide quality healthcare.
Biomedical Engineering	19BM7404	Wearable Medical Devices		✓	✓		Understand some common principles of signal transduction, data acquisition, and sensor characterization relevant to wearable devices.

Biomedical Engineering	19BM7405	Cardiovascular Engineering	✓		✓		This course addresses the molecular basis of cardiovascular development and pathogenesis, engineering analysis of cardiovascular function, and fundamentals of cardiovascular regeneration and engineering.
Biomedical Engineering	19BM8306	Rehabilitation Engineering			✓	✓	Address the molecular basis of cardiovascular development and pathogenesis, engineering analysis of cardiovascular function, and fundamentals of cardiovascular regeneration and engineering.
Biomedical Engineering	19BM8307	Virtual Reality in Medicine	✓	✓	✓	✓	Virtual reality is a simulated 3D environment that enables users to explore and interact with a virtual surrounding in a way that approximates reality, as it is perceived through the users' senses.
Biomedical Engineering	19BM8308	Bio photonics	✓	✓	✓	✓	Understand the interaction of light with cells and tissues, the function and purpose of passive and optical elements used in bio photonics.
Biomedical Engineering	19BM8309	Telemedicine		✓	✓		Understand professionals can meet with patients to diagnose, treat, and perform follow-up care just as any traditional medical visit, but in a virtual setting.
Biomedical Engineering	19BM8310	Biometric Systems	✓	✓	✓	✓	Demonstrate knowledge of the basic physical and biological science and engineering principles underlying biometric systems.

BTech FOOD TECHNOLOGY

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Food Technology	22FT2151	Biochemistry		✓	✓	✓	Educate about the importance of carbohydrates, proteins, fat, minerals, vitamins and water in food and correlating the biochemical processes with biotechnology applications. Applying the principles and process to produce primary and secondary metabolites.
Food Technology	22MC1095	UHV	✓	✓	✓	✓	To inherent dignity, worth, and rights of every individual, regardless of differences in background, beliefs, or circumstances.
Food Technology	22HE1073	Introduction to soft skills	✓	✓	✓	✓	focused course is designed to develop essential soft skills that enhance personal and professional growth
Food Technology	22MC1091	Heritage of Tamil	✓	✓	✓	✓	explores the rich cultural, historical, and literary heritage of Tamil, one of the oldest languages in the world.
Food Technology	22HE2071	Design Thinking	✓	✓	✓	✓	To fosters a holistic approach to problem-solving, emphasizing empathy, creativity, and iterative prototyping to generate user-centered solutions that address complex challenges effectively.

Food Technology	22HE2073	Soft Skills and Aptitude -1	✓	✓	✓	✓	Training programs - To encompassing communication, teamwork, adaptability, and empathy, are pivotal in fostering professional success and cultivating meaningful relationships, bridging the gap between technical expertise and interpersonal effectiveness.
Food Technology	22HE3071	Soft Skills - I	✓	✓	✓	✓	Training programs - To guides individuals with the necessary tools, insights, and support to navigate their professional journey, empowering them to make informed decisions, pursue fulfilling opportunities, and achieve their aspirations with confidence.
Food Technology	22HE3072	Ideation Skills	✓	✓	✓	✓	To involves inspiring, guiding, and empowering individuals and teams to achieve common goals, fostering a culture of collaboration, innovation, and excellence while navigating challenges with resilience and vision.
Food Technology	22HE4071	Soft Skills - III	✓	✓	✓	✓	To guides individuals with the necessary tools, insights, and support to navigate their professional journey, empowering them to make informed decisions, pursue fulfilling opportunities, and achieve their aspirations with confidence.
Food Technology	21HE5071	Soft Skills - I	✓	✓	✓	✓	Training programs - To encompassing communication, teamwork, adaptability, and empathy, are pivotal in fostering professional success and cultivating meaningful relationships, bridging the gap between technical expertise and interpersonal effectiveness.

Food Technology	21HE5072	Design Thinking	✓	✓	✓	✓	To fosters a holistic approach to problem-solving, emphasizing empathy, creativity, and iterative prototyping to generate user-centered solutions that address complex challenges effectively.
Food Technology	21FT6701	Internship / Industrial Training	✓	✓	✓	✓	To offers invaluable hands-on experience, bridging the gap between academic learning and real-world application, equipping individuals with practical skills, industry insights, and professional networks crucial for future career success.
Food Technology	21HE6071	Soft Skills - II	✓	✓	✓	✓	Training programs - To encompassing communication, teamwork, adaptability, and empathy, are pivotal in fostering professional success and cultivating meaningful relationships, bridging the gap between technical expertise and interpersonal effectiveness.
Food Technology	21HE6072	Intellectual Property Rights (IPR)	✓	✓	✓	✓	to incentivize innovation and creativity by granting exclusive rights to creators and inventors, thereby fostering economic growth, promoting technological advancement, and ensuring fair recognition and protection of intellectual assets.
Food Technology	22FT2152	Food Biochemistry and Nutrition	✓	✓	✓	✓	Understanding biochemical processes in food is crucial for roles in quality control, research and development, and nutrition analysis.

Food Technology	22ME2001	Engineering Practices	✓	✓	✓	✓	provide students with hands-on exposure to basic engineering tools, techniques, and practices across various disciplines
Food Technology	22MA3107	Numerical Methods	✓	✓	✓	✓	Skills in statistical analysis and numerical methods are valuable for data analysis and process optimization in the food industry.
Food Technology	22FT3201	Food Microbiology	✓	✓	✓	✓	Expertise in food microbiology is necessary for ensuring food safety and quality, applicable in roles such as quality assurance and product development.
Food Technology	22FT3202	Fundamentals of Heat and Mass Transfer	✓	✓	✓	✓	Knowledge of heat and mass transfer principles is essential for designing and optimizing food processing equipment.
Food Technology	22FT3203	Fluid Mechanics	✓	✓	✓	✓	Skills in fluid mechanics are essential for designing and optimizing food processing equipment and systems.
Food Technology	22FT3251	FoodChemisry	✓	✓	✓	✓	Proficiency in food chemistry is essential for roles in product development, quality assurance, and regulatory compliance.
Food Technology	22FT3001	Unit Operations Laboratory	✓	✓	✓	✓	Practical experience in unit operations prepares students for roles in food processing and manufacturing.
Food Technology	22FT3002	Food Microbiology Laboratory	✓	✓	✓	✓	Practical experience in microbiological techniques prepares students for roles in food safety testing and quality assurance.
Food Technology	22HE4101	IPR and Start-ups	✓	✓	✓	✓	to incentivize innovation and creativity by granting exclusive rights to creators and inventors, thereby fostering economic growth, promoting technological advancement, and ensuring fair recognition and protection of intellectual assets.
Food Technology	22MA4104	Probability and Operations Research	✓	✓	✓	✓	Skill Dvelopment ecourse provides foundational knowledge and practical skills in

							probability theory and operations research, essential for making data-driven decisions in complex systems.
Food Technology	22FT4201	Principles of Thermodynamics	✓	✓	✓	✓	Understanding thermodynamics is vital for optimizing energy usage in food processing and refrigeration systems.
Food Technology	22FT4202	Refrigeration and Cold Chain Management	✓	✓	✓	✓	Expertise in refrigeration and cold chain management is valuable for preserving food quality and safety during storage and transportation.
Food Technology	22FT4203	Unit operations in Food Processing	✓	✓	✓	✓	provides a comprehensive Skilla and understanding of the fundamental principles and practical applications of unit operations in food processing.
Food Technology	22FT4204	Food Analysis and Quality Control	✓	✓	✓	✓	Skills in food analysis and quality control are essential for ensuring product safety and compliance with regulatory standards.
Food Technology	22FT4001	Food Analysis and Quality Control Laboratory	✓	✓	✓	✓	Hands-on experience in food analysis strengthens skills in quality assurance and regulatory compliance.
Food Technology	22FT4002	Unit Operations in Food Processing Laboratory	✓	✓	✓	✓	Hands-on experience in unit operations strengthens skills in food processing techniques and equipment operation.
Food Technology	21FT5201	Baking and Confectionery Technology	✓	✓	✓	✓	Understanding and developing baking skills and knowledge in tehnology involved in the processing of bakery related food products
Food Technology	21FT5201	Food Additives	✓	✓	✓	✓	Understanding food additives and their functions is essential for product formulation and regulatory compliance in the food industry.
Food Technology	21FT5203	Livestock and Fish Process Technology	✓	✓	✓	✓	Expertise in processing poultry, meat, and fish is valuable for roles in meat processing plants and seafood industries.

Food Technology	21FT5204	Principles of Food Processing	✓	✓	✓	✓	Understanding food processing principles prepares students for roles in food manufacturing and process optimization.
Food Technology	21FT5205	Unit Operations in Food Processing	✓	✓	✓	✓	Knowledge of unit operations in food processing is essential for optimizing production processes and ensuring product quality.
Food Technology	21FT5001	Baking and Confectionery Technology Laboratory	✓	✓	✓	✓	Baking and Confectionery Technology Laboratory: Practical experience in baking and confectionery production enhances skills in product development and quality control.
Food Technology	21FT5002	Unit Operations in Food Processing Laboratory	✓	✓	✓	✓	Hands-on experience in unit operations strengthens skills in food processing techniques and equipment operation.
Food Technology	21FT5301	Technology of Fats and Oils	✓	✓	✓	✓	Understanding the technology of fats and oils is essential for roles in lipid processing and product development.
Food Technology	21FT5302	Food Storage and Infestation Control	✓	✓	✓	✓	Expertise in food storage and pest control is valuable for maintaining product quality and safety during storage and distribution.
Food Technology	21FT5303	Food Process Calculations	✓	✓	✓	✓	Skills in process calculations are essential for optimizing production processes and ensuring product consistency.
Food Technology	21FT5304	Post-Harvest Technology	✓	✓	✓	✓	Knowledge of post-harvest technology is valuable for roles in agricultural production and food preservation.
Food Technology	21FT5305	Cane sugar Technology	✓	✓	✓	✓	Specialized knowledge in cane sugar technology is valuable for roles in sugar refining and sweetener production.
Food Technology	21FT5306	Milling Technology for Food Materials	✓	✓	✓	✓	Understanding milling technology is essential for processing grains and other food materials into flour and meal.

Food Technology	21FT6201	Dairy Engineering	✓	✓	✓	✓	Expertise in dairy engineering is valuable for roles in dairy processing and cheese production.
Food Technology	21FT6202	Plantation crops and Spices Products Technology	✓	✓	✓	✓	Knowledge of plantation crop processing is valuable for roles in spice production and flavoring.
Food Technology	21FT6203	Fruits and Vegetable Processing Technology	✓	✓	✓	✓	Expertise in fruit and vegetable processing is valuable for roles in food preservation and product development.
Food Technology	21FT6181	Professional Ethics in Engineering	✓	✓	✓	✓	Understanding professional ethics is essential for maintaining integrity and accountability in engineering roles.
Food Technology	21FT6001	Dairy Engineering Laboratory	✓	✓	✓	✓	Practical experience in dairy processing enhances skills in milk processing and product development.
Food Technology	19FT6002	Fruits and Vegetable Processing Technology Laboratory	✓	✓	✓	✓	Hands-on experience in fruit and vegetable processing strengthens skills in food preservation and product development.
Food Technology	21FT6301	Radiation Processing and Preservation of Foods	✓	✓	✓	✓	Specialized knowledge in beverage technology is valuable for roles in beverage production and quality assurance.
Food Technology	21FT6302	Technology of Snack and Extruded Foods	✓	✓	✓	✓	Expertise in snack and extruded food technology is valuable for roles in snack manufacturing and product development.
Food Technology	21FT6303	Food Biotechnology	✓	✓	✓	✓	Knowledge of food biotechnology is essential for roles in food ingredient development and genetic modification.
Food Technology	21FT6304	Bioprocess Engineering	✓	✓	✓	✓	Understanding bioprocess engineering is valuable for roles in fermentation and enzyme production.
Food Technology	21FT6305	Enzyme Technology	✓	✓	✓	✓	Expertise in enzyme technology is valuable for roles in food processing and biotechnology.

Food Technology	21FT6306	Crop Process Engineering	✓	✓	✓	✓	Knowledge of crop process engineering is valuable for roles in crop processing and agricultural production.
Food Technology	21FT6401	Traditional Foods	✓	✓	✓	✓	Understanding traditional food processing techniques is valuable for preserving cultural heritage and developing authentic food products.
Food Technology	19FT7201	Food Analysis and Quality Control	✓	✓	✓	✓	Skills in food analysis and quality control are essential for ensuring product safety and compliance with regulatory standards.
Food Technology	19FT7202R	Food Packaging	✓	✓	✓	✓	Expertise in food packaging is valuable for roles in packaging design, materials selection, and product protection.
Food Technology	19FT7203	Food Plant Layout and Management	✓	✓	✓	✓	Knowledge of food plant layout and management is essential for optimizing production processes and ensuring workplace safety.
Food Technology	19FT7001	Food Packaging Laboratory	✓	✓	✓	✓	Practical experience in food packaging enhances skills in packaging design and testing.
Food Technology	19FT7002	Food Analysis and Quality Control Laboratory	✓	✓	✓	✓	Hands-on experience in food analysis strengthens skills in quality assurance and regulatory compliance.
Food Technology	19FT7301	Functional foods and Nutraceuticals	✓	✓	✓	✓	Specialized knowledge in functional foods and nutraceuticals is valuable for roles in product development and health promotion.
Food Technology	19FT7302	Biology and Chemistry of Food Flavors	✓	✓	✓	✓	Understanding the biology and chemistry of food flavors is essential for roles in flavor development and enhancement.
Food Technology	19FT7303	Food Toxicology and Allergy	✓	✓	✓	✓	Expertise in food toxicology and allergy is valuable for ensuring product safety and compliance with regulatory standards.

Food Technology	19FT7304	Advanced Drying Technology	✓	✓	✓	✓	Knowledge of advanced drying technology is valuable for roles in food preservation and dehydration.
Food Technology	19FT7306	Processing Technology of Legumes and Oilseeds	✓	✓	✓	✓	Understanding processing technology for legumes and oilseeds is essential for roles in oil extraction and protein processing.
Food Technology	19FT7307	Emerging Non-Thermal Processing of Foods	✓	✓	✓	✓	Knowledge of emerging non-thermal processing techniques is valuable for roles in food preservation and safety.
Food Technology	19FT7401	Post Harvest Technology of Fruits and Vegetables	✓	✓	✓	✓	Expertise in post-harvest technology is valuable for roles in fruit and vegetable preservation and quality control.
Food Technology	19FT7901	Project Phase I	✓	✓	✓	✓	: Practical experience in project management enhances skills in problem-solving and teamwork.
Food Technology	19FT8301	Food Process Economics and Industrial Management	✓	✓	✓	✓	Understanding food process economics and industrial management is essential for optimizing production processes and ensuring profitability.
Food Technology	19FT8302	Food Laws and Safety	✓	✓	✓	✓	Knowledge of food laws and safety regulations is essential for ensuring compliance and maintaining product quality.
Food Technology	19FT8303	Waste Management and By-Product Utilization in Food Industries	✓	✓	✓	✓	Expertise in waste management and by-product utilization is valuable for minimizing waste and maximizing resource efficiency.
Food Technology	19FT8304	Instrumentation and Process Control	✓	✓	✓	✓	Skills in instrumentation and process control are essential for optimizing production processes and ensuring product quality.
Food Technology	19FT8305	Economics and Management	✓	✓	✓	✓	Understanding economics and management principles is essential for effective decision-making and resource allocation in the food

							industry.
Food Technology	19FT8312	Total Quality Management	✓	✓	✓	✓	Knowledge of total quality management principles is essential for ensuring product quality and customer satisfaction.
Food Technology	19FT8306	Food process plant layout and safety	✓	✓	✓	✓	Expertise in food process plant layout and safety is essential for optimizing workflow and minimizing workplace hazards.
Food Technology	19FT8307	Energy Management in Process Industries	✓	✓	✓	✓	Understanding energy management principles is essential for optimizing energy usage and reducing environmental impact in food processing.
Food Technology	19FT8308	Emerging Technologies in Food Processing	✓	✓	✓	✓	Knowledge of emerging technologies is valuable for staying competitive and innovating in the food industry.
Food Technology	19FT8309	Separation Techniques in Food Processing	✓	✓	✓	✓	Skills in separation techniques are essential for purifying and refining food products.
Food Technology	19FT8310	Analytical Instruments in Food Industries	✓	✓	✓	✓	Expertise in analytical instruments is valuable for conducting quality control tests and product analysis.
Food Technology	19FT8311	Entrepreneurship Opportunities for Food Technologists	✓	✓	✓	✓	Understanding entrepreneurship opportunities prepares students for starting their own food-related businesses or ventures.
Food Technology	19FT8313	Application of Nanotechnology and Cryogenics	✓	✓	✓	✓	Knowledge of nanotechnology and cryogenics is valuable for developing advanced food processing techniques and materials.
Food Technology	19FT8901	Project Work – Phase II	✓	✓	✓	✓	Practical experience in project work enhances skills in research, problem-solving, and project management.
Food Technology	19FT7201	Food Analysis and Quality Control	✓		✓	✓	Educate the principles behind analytical techniques in food analysis, Realize the role of food analysis in food standards and

							regulations for the manufacture and the sale of food products and food quality control in food industries.
Food Technology	19FT7202	Food Packaging		✓	✓		Understand basic concepts in food packaging, applying different kinds of packaging material over food products to transfer and maintain the shelf life.
Food Technology	19FT7203	Food Plant Layout and Management		✓	✓	✓	To give knowledge about food plant design process, their feasibility study and analysis, location and site selection, planning and experimentation, engineering economics, process scheduling and operation, and building materials and construction.
Food Technology	19FT7001	Food Packaging Laboratory	✓	✓	✓		Understand the mechanical, water barrier properties of packaging materials, Apply the techniques like extraction, drying, dehydration, canning, MAP, CAP to preserve the Product.
Food Technology	19FT7002	Food Analysis and Quality Control Laboratory			✓	✓	Employability - Demonstrate simple detection methods of food adulteration, Implement the hygienic practices in food processing industry.
Food Technology	19FT7301	Functional foods and Nutraceuticals		✓			To understand the functional food concept as related to ingredient efficacy and safety. In addition, it familiarizes students with: examples of bioactive ingredient-disease relationships and the importance of clinical study support; regulatory aspects of

							functional foods; and requirements for standards of evidence of efficacy for health claims; and market determinants of the functional food industry
Food Technology	19FT7302	Biology and Chemistry of Food Flavors		✓	✓	✓	To provide an understanding of the chemical function and properties of major food components and to provide an understanding of the chemical interactions of food components and their effects on sensory and nutritional quality, functional properties, and safety of foods
Food Technology	19FT7303	Food Toxicology and Allergy		✓	✓	✓	To argue the importance of food toxicology for human health and evaluate the microbial and parasitic that cause food poisoning and to evaluate the potential of the components' risks in the natural occurring toxins in food
Food Technology	19FT7304	Advanced Drying Technology			✓	✓	Able to employ the selection of suitable drying technology for a specific food and able to demonstrate the advanced drying technology for good quality of food products and energy efficient. Ability to design and propose the concept of hybrid drying to solve a specific drying problem in industry and able to model and simulate the simple drying process for food.
Food Technology	19FT7305	Cereal Technology	✓	✓		✓	To familiarize the students about the importance of cereals for our daily diet And to know about the nutritional value of different cereals and to know the milling

							processes of different cereals and to develop practical skills in determining the composition of cereals
Food Technology	19FT7306	Processing Technology of Legumes and Oilseeds	✓	✓	✓	✓	To impart knowledge to the students on Legume and Oil Seed Processing. By the end of the course students will be able to develop good expertise on the technical aspects of dhal milling, oil milling and various legumes and oil seeds-based product preparations.
Food Technology	19FT7307	Emerging Non-Thermal Processing of Foods		✓			Able to apply principles of food engineering in industry, understand, identify and analyze the problem related to the food industry and ability to find an appropriate solution for the same. They will be able to design, implement and evaluate a research-based project to meet demands of the society.
Food Technology	19FT7401	Post Harvest Technology of Fruits and Vegetables	✓	✓	✓		To give students an understanding on various changes occurring in fruits and vegetables during the pre-and post-harvest stages.
Food Technology	19FT7901	Project Phase I	✓	✓	✓	✓	Demonstrate a sound technical knowledge of their selected project topic and to undertake problem identification, formulation and solution. To design engineering solutions to complex problems utilising a systems approach.
Food Technology	19FT8301	Food Process Economics and Industrial	✓	✓	✓		Exploration of the economic principles and industrial management practices within the context of the food processing industry. It

		Management					combines theoretical knowledge with practical applications to equip students with the skills necessary to analyze, plan, and optimize operations in food processing facilities.
Food Technology	19FT8302	Food Laws and Safety		✓	✓	✓	To Provide adequate food safety training to everyone who handles food in your business is essential to protecting your customers from food poisoning, allergic reactions and other health risks that could occur from eating contaminated food.
Food Technology	19FT8303	Waste Management and By-Product Utilization in Food Industries	✓				To introduce the technologies of waste disposal, waste utilization and waste recycling. The special accent will be put on biological processes of waste treatment. During the course students will be inform about the rules of law connected to the waste treatment and about the analytical methods for waste analysis.
Food Technology	19FT8304	Instrumentation and Process Control	✓	✓	✓		Apply instrumentation & control in multidisciplinary domains related to research & entrepreneurship development. (Domains: Process, Biomedical, Environment, Power generation etc.)
Food Technology	19FT8305	Economics and Management		✓	✓		The purpose of this course is to apply micro economic concepts and techniques in evaluating business decisions taken by firms.
Food Technology	19FT8312	Total Quality Management	✓	✓	✓	✓	To get familiarized with the basic concept and framework of Total Quality management and

							to Understand the contribution of Quality Gurus in TQM Journey
Food Technology	19FT8306	Food process plant layout and safety	✓			✓	Educate the Layout of the processing plants across all food sectors and its maintanance procedures based on the standards and regulations
Food Technology	19FT8307	Energy Management in Process Industries		✓	✓	✓	To introduce the energy and water management principles related to process plants.
Food Technology	19FT8308	Emerging Technologies in Food Processing	✓	✓	✓	✓	Able to apply principles of food engineering in industry, understand, identify and analyze the problem related to the food industry and ability to find an appropriate solution for the same. They will be able to design, implement and evaluate a research-based project to meet demands of the society.
Food Technology	19FT8309	Separation Techniques in Food Processing			✓		To understand various separation techniques applied in food industry. · To understand separation mechanism of different equipments. · To understand separation technology for various food products
Food Technology	19FT8310	Analytical Instruments in Food Industries			✓	✓	To study various food analysis techniques and to get the knowledge of UV-Visible spectrometry, infra-red & mass spectra, x-ray, polarimetry, refractometry, conductometry& thermal studies, chromatographic techniques and to understand the quality control methods and systems. To be familiar with

							different methods of investigation used in the analysis of foods.
Food Technology	19FT8311	Entrepreneurship Opportunities for Food Technologists	✓	✓	✓	✓	Overview on food processing sector and food business in context to global scenario.
Food Technology	19FT8313	Application of Nanotechnology and Cryogenics		✓	✓		Students will delve into the fundamental principles of both nanotechnology and cryogenics and examine their applications in food processing industries
Food Technology	19FT8901	Project Work – Phase II	✓	✓	✓	✓	Demonstrate a sound technical knowledge of their selected project topic and to undertake problem identification, formulation and solution. To design engineering solutions to complex problems utilising a systems approach.

BTech CHEMICAL ENGINEERING

CoursesFocusonGlobal,National,RegionalandLocalNeeds

Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Chemical Engineering	22CH2201	Principles of Chemical Engineering			✓	✓	Understand the overall view of the chemical reactions and Chemical Engineering.
Chemical Engineering	22CH2201	Introduction to Chemical Engineering	✓	✓	✓	✓	To understand the overall view of the chemical reactions and chemical engineering.
Chemical Engineering	22CH3201	Chemical Process Calculations	✓	✓	✓	✓	Gaining knowledge of the calculations taking place in a different unit operations, unit conversion.
Chemical Engineering	22CH3202	Fluid Flow Operations	✓	✓	✓	✓	operations abound in biochemical, chemical, energy, fermentation, materials, mining, petroleum, pharmaceutical industries.
Chemical Engineering	22CH3203	Chemical Engineering Thermodynamics – I	✓	✓	✓	✓	research skills,research in a way of knowing or understanding something by gathering data from thermodynamics.
Chemical Engineering	22CH3251	Mechanical Operations	✓	✓	✓	✓	provides idea and opportunity for the mechanical operations by using chemical

							engineering knowledge
Chemical Engineering	22CH3001	Fluid Flow Operations Lab	✓	✓	✓	✓	it is an introductory course where flow behaviour,fluid forces and analysis tools,many of them developed within the laboratory itself.
Chemical Engineering	22CH3002	Technical Analysis Lab	✓	✓	✓	✓	to design and troubleshoot processes for the production of chemicals, fuels, foods, biologicals, pharmaceutical. the designing equipment,systems,and processes for refining raw materials and for mixing,compounding and processing chemicals.
Chemical Engineering	22CH4201	Mass Transfer Operations - I	✓	✓	✓	✓	the concept of distillations, absorption and many other unit operations are employed to run a industry
Chemical Engineering	22CH4202	Chemical Engineering Thermodynamics – II	✓	✓	✓	✓	Employability increased knowledge about thermodynamics which is an important part of chemical engineering
Chemical Engineering	22CH4203	Process Heat Transfer	✓	✓	✓	✓	knowledge about rates of heat exchange as they occur in the heat-transfer
Chemical Engineering	22CH4204	Chemical Process Industries	✓	✓	✓	✓	focussed on the development, scale-up and optimization of a chemical synthetic route, leading to safe, reproducible and economical chemical manufacturing process.
Chemical Engineering	22CH4251	Chemical Reaction	✓	✓	✓	✓	deals with the concepts of reaction rate,

		Engineering - I					stoichiometry and equilibrium analysis.
Chemical Engineering	22CH4001	Heat Transfer Lab	✓	✓	✓	✓	Skill development- determine the temperature distribution, measurement of emissivity, thermocouple calibration
Chemical Engineering	21CH5201	Chemical Reaction Engineering – I	✓	✓	✓	✓	deals with the concepts of reaction rate, stoichiometry and equilibrium analysis.
Chemical Engineering	21CH5202	Mass Transfer – II	✓	✓	✓	✓	Skill development -knowledge of combined mass,heat and momentum transfer is crucial to chemical engineering.
Chemical Engineering	21CH5203	Process Instrumentation Dynamics and Control	✓	✓	✓	✓	concerned with analyzing the dynamic behavior of a process in response to various types of inputs.
Chemical Engineering	21CH5204	Safety in Chemical Industries	✓	✓	✓	✓	To learn how to identify chemical hazardous areas and where they exist around the facility.
Chemical Engineering	21CH5251	Water Treatment and Solid Waste Management	✓	✓	✓	✓	Types of pollutants and sources. Understand the primary, secondsry and tertiary treatment of waste water.
Chemical Engineering	21CH5001	Mass Transfer Lab	✓	✓	✓	✓	knowledge about mass transfer mechanisms and the different processes
Chemical Engineering	21CH5002	Process Control Lab	✓	✓	✓	✓	deals with chemical reactors and relates specifically to catalytic reaction systems.

Chemical Engineering	21CH5301	Energy Technology	✓	✓	✓	✓	Understand about the energy and its classification. Understand about non-conventional energy resources and its production.
Chemical Engineering	21CH5302	Petroleum Formation Evaluation	✓	✓	✓	✓	Understand petroleum engineering principles, their application to petroleum and natural gas manufacturing problems.
Chemical Engineering	21CH6201	Chemical Reaction Engineering– II	✓	✓	✓	✓	knowledge about various types of reactors and their operations under different conditions like isothermal and non-isothermal conditions
Chemical Engineering	21CH6202	Chemical Process Industries	✓	✓	✓	✓	focussed on the development, scale-up and optimization of a chemical synthetic route, leading to safe, reproducible and economical chemical manufacturing process.
Chemical Engineering	21CH6181	Professional Ethics in Engineering	✓	✓	✓	✓	encompasses the personal and corporate standards of behavior expected of professionals
Chemical Engineering	21CH6251	Fluidization Engineering	✓	✓	✓	✓	knowledge about the properties of fluids, drag types, axial slugs, types of bed.
Chemical Engineering	21CH6001	Chemical Reaction Engineering Lab	✓	✓	✓	✓	knowledge about various types of reactors and their operations under different conditions like isothermal and non-isothermal conditions
Chemical Engineering	21CH6302	Enzyme Engineering	✓	✓	✓	✓	Skill Development - Develop skills of the students in the area of Enzyme Engineering

							with emphasis on reactor operation and design.
Chemical Engineering	21CH6303	Fundamentals of Nano science	✓	✓	✓	✓	Skill Development - Understand about the various characterization techniques for the identification of nano size and structure.
Chemical Engineering	21CH6304	Corrosion Science and Engineering	✓	✓	✓	✓	Employablity - Understanding of the corrosion principles and engineering methods used to minimize and prevent the corrosion. Basic concepts: Definition and importance, Electrochemical nature and forms of corrosion, Corrosion rate and its determination
Chemical Engineering	21CH6305	Piping and Instrumentation	✓	✓	✓	✓	Employability - Understand about the development of pipe layout, plot plan and equipment layout and its dynamic analysis.
Chemical Engineering	19CH6401	Waste to Energy Conversion	✓	✓	✓	✓	Understand about the Energy production from wastes through fermentation and trans esterification.
Chemical Engineering	19CH7201	Process Economics and Engineering Management	✓	✓	✓	✓	Understand about thecost of process industries and management skills.
Chemical Engineering	19CH7202	Process Equipment Design	✓	✓	✓	✓	ability to design the process equipments for Chemical Industries.
Chemical Engineering	19CH7002	Cpmputational fluid dynamics lab	✓	✓	✓	✓	Advanced expertise in CFD, cultivating precision, and analytical proficiency.
Chemical Engineering	19CH8301	Industrial Management	✓	✓	✓	✓	Acquiring expertise in industrial management enhances graduates' employability across various sectors by preparing them to lead and optimize complex organizational processes."
Chemical Engineering	19CH8303	Total Quality Management	✓	✓	✓	✓	-graduates experts in improving products and services across industries."

Chemical Engineering	19CH8304	Foundation Skills in Integrated Product Development	✓	✓	✓	✓	enhance employability by equipping graduates with the expertise to drive innovation and efficiency in product design and manufacturing processes."
Chemical Engineering	19CH8305	Supply Chain Management	✓	✓	✓	✓	students equipping them with essential skills to optimize logistical processes and ensure organizational efficiency across industries."
Chemical Engineering	19CH8306	Process Plant Utilities	✓	✓	✓	✓	enhances students to provide essential skills to manage and optimize utility systems crucial for industrial operations across sectors
Chemical Engineering	19CH8307	Fermentation Technology	✓	✓	✓	✓	To equip students with practical skills and knowledge relevant to careers in industries such as pharmaceuticals, food, and beverages.
Chemical Engineering	19CH8311	Membrane Separation Process	✓	✓	✓	✓	enhances students to provide essential skills to manage and optimize utility systems crucial for industrial operations across sectors
Chemical Engineering	19CH7201	Process Economics and Engineering Management	✓	✓	✓	✓	Enable the students to understand the various concepts of economics, process development, design consideration and cost estimation in chemical industry.
Chemical Engineering	19CH7202	Process Equipment Design	✓	✓	✓		Students learn to do in detail process and mechanical design and engineering drawing of different Chemical Engineering equipments.
Chemical Engineering	19CH7001	Design and Simulation Lab	✓	✓	✓	✓	Understand the fundamentals concepts in mathematics, problems solving and computer programming.
Chemical Engineering	19CH7002	Computational Fluid Dynamics Lab		✓	✓		Involved the numerical solution of some common problems of Chemical Engineering and aim to visualize the effect of various

							factors on the flow of heat and mass transfer.
Chemical Engineering	19CH7301	Natural Gas Engineering	✓	✓	✓	✓	Students will learn the basic concept and applications of Natural Gas Engineering
Chemical Engineering	19CH7302	Pulp and Paper Technology	✓	✓	✓		focused on papermaking science and technology and is intended to be especially valuable to students majoring in programs leading to careers in corporate or government positions which would interface with the paper related industries.
Chemical Engineering	19CH7303	Transport Phenomena	✓	✓	✓	✓	Develop a fundamental knowledge of the physical principles that govern the transport of momentum, energy and mass, with emphasis on the mathematical formulation of the conservation principles.
Chemical Engineering	19CH7304	Multicomponent Distillation	✓	✓	✓	✓	Understand the concepts of Multicomponent distillation systems.
Chemical Engineering	19CH7305	Chemical Process Optimization	✓	✓	✓		Understand the concepts of Multicomponent distillation systems.
Chemical Engineering	19CH7401	Biomass Conversion and Biorefinery	✓	✓	✓	✓	Provide an insight to the basics of biomass, various conversion technologies and the different types of products that can be obtained upon successful conversion.
Chemical Engineering	19CH8301	Industrial Management	✓	✓	✓		Provide an opportunity to learn basic management concepts essential for business

Chemical Engineering	19CH8302	Sugar Technology	✓	✓	✓	✓	Give an idea about IPR, registration and its enforcement.
Chemical Engineering	19CH8303	Total Quality Management	✓	✓	✓	✓	Facilitate the understanding of Quality Management principles and process
Chemical Engineering	19CH8304	Foundation Skills in Integrated Product Development	✓	✓	✓		Get an idea about the global trends and the requirement of skills for integrated product development
Chemical Engineering	19CH8305	Supply Chain Management	✓	✓	✓		Provide an insight on the fundamentals of supply chain networks, tools and techniques.
Chemical Engineering	19CH8306	Process Plant Utilities	✓	✓	✓		Enable the students to understand the process plant utilities and optimization techniques to optimize various parameters in chemical industries.
Chemical Engineering	19CH8307	Fermentation Technology	✓	✓	✓		Enable the students to understand the role of fermentation microorganisms and (bio) chemical activities and conversions that take place during fermentations, and their impact on quality.
Chemical Engineering	19CH8308	Frontiers of Chemical Technology	✓	✓	✓		Students will know the latest trends to be followed in the process industries.
Chemical Engineering	19CH8309	Industrial Nanotechnology	✓	✓	✓		Elucidate on advantages of nanotechnology-based applications in each industry and provide instances of contemporary industrial applications of nanotechnology.

Chemical Engineering	19CH8310	Drugs and Pharmaceutical Technology	✓	✓	✓		Give the students an understanding of the polytechnical nature of engineering and drug discovery in the pharmaceutical industry involving Chemical Engineering.

BE ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

CoursesFocusonGlobal,National,RegionalandLocalNeeds

Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
Artificial Intelligence and Machine Learning	22CS1152	Object Oriented Programming Using Python	✓	✓	✓	✓	Learning the concepts of C Programming.
Artificial Intelligence and Machine Learning	22MA2103	Differential Equations and Linear Algebra	✓	✓	✓		Study the properties of matrices and the solution of differential equations.
Artificial Intelligence and Machine Learning	22ME2001	Engineering Practices	✓	✓	✓		Interpret the projections of simple solid objects in plan and elevation.

Artificial Intelligence and Machine Learning	22CS2253	Java Fundamentals	✓	✓	✓	✓	Understand OOPs Principle, Packages, and interfacing concepts and understand event handling and able to develop simple applets.
Artificial Intelligence and Machine Learning	22CS1152	OBJECT ORIENTED PROGRAMMING USING PYTHON	✓	✓	✓	✓	Understand the concepts of tuples, dictionary, identifiers exception handling concepts.
Artificial Intelligence and Machine Learning	22IT1152	Introduction to Web Application Development	✓	✓	✓	✓	Understand the development of a client-side browser based web application including its capabilities and limitations. Develop skills in client-side web application development technologies. Design a web application using web programming patterns based on data analytics to enhance the front end user experience.
Artificial Intelligence and Machine Learning	22IT2251	Python Programming and Practices	✓	✓	✓	✓	Learning Python programming and practices enhances employability and skill development by providing versatile coding skills for data analysis, web development, automation, and software engineering.
Artificial Intelligence and Machine Learning	22IT2253	Dynamic Web Design	✓	✓	✓	✓	Mastering dynamic web design enhances employability and entrepreneurship by equipping individuals with skills to create interactive, responsive, and user-centric web applications for diverse digital

							solutions.
Artificial Intelligence and Machine Learning	22HE2071	Design Thinking	✓	✓	✓	✓	Studying design thinking enhances employability and entrepreneurship by fostering creativity, problem-solving, and user-centric innovation skills for developing impactful solutions.
Artificial Intelligence and Machine Learning	22HE2072	Soft Skills And Aptitude -1	✓	✓	✓	✓	Developing soft skills and aptitude enhances employability and entrepreneurship by building communication, problem-solving, and critical thinking abilities essential for professional success and leadership.
Artificial Intelligence and Machine Learning	22AI3201	Data Structures	✓	✓	✓	✓	Understand Linear and Non Linear Data structures, Able to apply sorting and searching algorithms.Understand Graph traversl techniques.
Artificial Intelligence and Machine Learning	22AI3202	Foundations of Artificial Intelligence	✓	✓	✓	✓	At its core, AI reads human behavior to develop intelligent machines. Simply put, the foundational goal of AI is to design a technology that enables computer systems to work intelligently yet independently.
Artificial Intelligence and Machine Learning	22AI3253	Clean Coding and Devops	✓	✓	✓	✓	makes the code more readable and hence easily maintainable.clean coding is the way of writing code such that it is easily readable, testable, and less prone to errors

Artificial Intelligence and Machine Learning	22AI3003	Data Structures Laboratory	✓	✓	✓	✓	Understand Linear and Non Linear Data structures, Able to apply sorting and searching algorithms.Understand Graph traversl techniques.
Artificial Intelligence and Machine Learning	22AI3002	Foundations of Artificial Intelligence Laboratory	✓	✓	✓	✓	the foundational goal of AI is to design a technology that enables computer systems to work intelligently yet independently.and also the tools to support for practice algorithms
Artificial Intelligence and Machine Learning	22HE3071	Soft Skills And Aptitude -2	✓	✓	✓	✓	A soft skills assessment can help illuminate areas where improving your skills can greatly improve the performance of your team, along with your own personal success. It'll also show you which soft skills you're strong in, so you can better understand how to teach those positive behaviors to others.
Artificial Intelligence and Machine Learning	22AI4201	Database Management Systems	✓	✓	✓	✓	Mastering database management systems enhances employability and entrepreneurship by equipping learners with essential skills in data organization, query optimization, and system design for effective decision-making and innovation.
Artificial Intelligence and Machine Learning	22AI4003	Data Visualization	✓	✓	✓	✓	Studying data visualization enhances employability and entrepreneurship by developing skills to effectively present complex data insights through compelling visual representations, enabling data-

							driven decision-making and innovation.
Artificial Intelligence and Machine Learning	22AI4203	Software Design with UML	✓	✓	✓	✓	Mastering software design with UML enhances employability and entrepreneurship by equipping individuals with skills to effectively model, communicate, and implement software solutions.
Artificial Intelligence and Machine Learning	22AI4251	Operating Systems	✓	✓	✓	✓	Understanding operating systems fosters employability and entrepreneurship by building critical skills in system architecture, process management, and resource optimization for software development and innovation.
Artificial Intelligence and Machine Learning	22AI4001	Database Management Systems Laboratory	✓	✓	✓	✓	Hands-on experience in Database Management Systems Laboratory enhances employability and skill development by providing practical expertise in database design, query execution, and real-world data management solutions.
Artificial Intelligence and Machine Learning	22AI4002	Data Visualization Laboratory	✓	✓	✓	✓	Data Visualization Laboratory fosters employability and skill development by equipping learners with practical expertise in creating impactful visual representations of data for informed decision-making and business innovation.

Artificial Intelligence and Machine Learning	21AI5201	Computer Networks	✓	✓	✓	✓	Understand different types of networks, the data communication system and the purpose of layered architecture . Understand the concepts of Routing methods and Subnetting.Interpret thr mechanism of Congestion control Connection methods . Understand various protocols used for heterogenous Application.
Artificial Intelligence and Machine Learning	21AI5251	Object Oriented Analysis and Design	✓	✓	✓	✓	understand about UML diagrams and case tools ,Analyze and design software requirements in efficient manner. Construct various UML models using the appropriate notation using the Rational Software Suite.
Artificial Intelligence and Machine Learning	21AI5202	DATA ANALYTICS	✓	✓	✓	✓	shape business processes, improve decision-making, and foster business growth
Artificial Intelligence and Machine Learning	21AI5001	Networks Laboratory	✓	✓	✓	✓	Hands-on experience in the Networks Laboratory enhances employability and skill development by providing practical expertise in configuring, managing, and troubleshooting computer networks for real-world applications.
Artificial Intelligence and Machine	21AI5002	DATA ANALYTICS LABORATORY	✓	✓	✓	✓	shape business processes, They use various tools and techniques to help organizations make decisions and

Learning							succeed.
Artificial Intelligence and Machine Learning	21HE5181	Management Information System	✓	✓	✓	✓	Studying Management Information Systems enhances employability and entrepreneurship by developing skills in designing and managing information systems that support strategic decision-making and business operations.
Artificial Intelligence and Machine Learning	21AI6203	NATURAL LANGUAGE PROCESSING	✓	✓	✓	✓	the ability of a computer program to understand human language as it's spoken and written
Artificial Intelligence and Machine Learning	21AI6301	NEURAL NETWORKS	✓	✓	✓	✓	-Teaches computers to process data in a way that is inspired by the human brain. It is a type of machine learning process, called deep learning, that uses interconnected nodes or neurons in a layered structure that resembles the human brain
Artificial Intelligence and Machine Learning	21AI6201	Theory of Computation	✓	✓	✓	✓	Studying the Theory of Computation enhances employability and skill development by fostering analytical thinking, problem-solving abilities, and a deep understanding of computational principles for designing efficient algorithms and systems.
Artificial Intelligence and Machine	21AI6202	Development of Machine Learning Models	✓	✓	✓	✓	Developing machine learning models enhances employability and entrepreneurship by building expertise in

Learning							creating predictive solutions, optimizing algorithms, and solving complex real-world problems through data-driven insights.
Artificial Intelligence and Machine Learning	21AI6251	Predictive Modeling	✓	✓	✓	✓	Mastering predictive modeling enhances employability and entrepreneurship by equipping individuals with skills to analyze data trends, forecast outcomes, and drive strategic decision-making.
Artificial Intelligence and Machine Learning	21HE6071	Soft Skills - II	✓	✓	✓	✓	A soft skills assessment can help illuminate areas where improving your skills can greatly improve the performance of your team, along with your own personal success. It'll also show you which soft skills you're strong in, so you can better understand how to teach those positive behaviors to others.
Artificial Intelligence and Machine Learning	21AI6001	NATURAL LANGUAGE PROCESSING LAB	✓	✓	✓	✓	Natural Language Processing Lab enhances employability and skill development by providing hands-on experience in building language models, text analysis tools, and AI-driven applications for real-world communication challenges.
Artificial Intelligence and Machine Learning	19AI7201	Cloud Computing	✓	✓	✓	✓	Studying cloud computing enhances employability and entrepreneurship by equipping individuals with skills to design, deploy, and manage scalable, cost-effective, and innovative cloud-based

							solutions.
Artificial Intelligence and Machine Learning	19AI7202	AI Analyst	✓	✓	✓	✓	Training as an AI Analyst enhances employability and entrepreneurship by developing expertise in data interpretation, AI model evaluation, and delivering actionable insights for business and technological innovation.
Artificial Intelligence and Machine Learning	19AI7203	Ethics and Policy Issues in AI Computing	✓	✓	✓	✓	Studying ethics and policy issues in AI computing enhances employability and entrepreneurship by equipping individuals with the knowledge to navigate the ethical, legal, and societal implications of AI technologies in real-world applications.
Artificial Intelligence and Machine Learning	19AI7251	Deep Learning Techniques	✓	✓	✓	✓	Mastering deep learning techniques enhances employability and entrepreneurship by developing skills to create advanced AI models for tasks such as image recognition, natural language processing, and autonomous systems.
Artificial Intelligence and Machine Learning	19AI7001	Cloud Computing Lab	✓	✓	✓	✓	Hands-on experience in the Cloud Computing Lab enhances employability and skill development by providing practical knowledge in deploying, managing, and optimizing cloud-based applications and infrastructure.
Artificial Intelligence and	19AI7901	Project Phase - I	✓	✓	✓	✓	Project Phase - I enhances employability and entrepreneurship by providing

Machine Learning							hands-on experience in project planning, problem-solving, and applying technical skills to real-world challenges.
Artificial Intelligence and Machine Learning	19AI7305	Web and Social media mining	✓	✓	✓	✓	Studying web and social media mining enhances employability and entrepreneurship by developing skills in extracting valuable insights from online data to inform business strategies, marketing, and trend analysis.
Artificial Intelligence and Machine Learning	19AI8901	Project Phase - II	✓	✓	✓	✓	Project Phase - II enhances employability and entrepreneurship by providing hands-on experience in project planning, problem-solving, and applying technical skills to real-world challenges.
Artificial Intelligence and Machine Learning	19AI7201	Cloud Computing	✓	✓	✓	✓	Learning the Communication Networks shared through the internet.
Artificial Intelligence and Machine Learning	19AI7202	Data Visualization	✓	✓	✓	✓	Practice of translating information into a visual context, such as a map or graph, to make data easier for the human brain to understand and pull insights from.
Artificial Intelligence and Machine Learning	19AI7203	Ethics and Policy Issues in AI Computing	✓	✓	✓	✓	AI initiatives of the organization or entity maintain human dignity and do not in any way cause harm to people that encompasses many things, such as fairness, anti-weaponization and liability, such as in the case of self-driving cars

							that encounter accidents.
Artificial Intelligence and Machine Learning	19AI7251	Deep Learning Techniques	✓	✓	✓	✓	Understand the basics of Deep Learning and enable the students to know Deep Learning Techniques to support Real-Time Applications.
Artificial Intelligence and Machine Learning	19AI7001	Cloud Computing Lab		✓	✓	✓	Design and implement applications on the Cloud Infrastructure able to Use Hadoop Environment and Cloud simulation environment.
Artificial Intelligence and Machine Learning	19AI7002	Data Visualization Lab	✓	✓	✓	✓	Researcher focused space that provides resources and support for finding, analyzing, visualizing, and managing research data.
Artificial Intelligence and Machine Learning	19AI8901	Project Work	✓	✓			Demonstrate a sound technical knowledge of their selected project topic and to undertake problem identification, formulation and solution.
Artificial Intelligence and Machine Learning	19AI7301	Computer Vision	✓	✓	✓	✓	Trains computers to interpret and understand the visual world. Using digital images from cameras and videos and deep learning models, machines can accurately identify and classify objects and then react to what they see.
Artificial Intelligence and Machine	19AI7302	Intelligent Multi Agent and Expert systems	✓			✓	Take multiple decision-making agents which interact in a shared environment to achieve common or conflicting goals.

Learning							
Artificial Intelligence and Machine Learning	19AI7303	Cognitive Systems	✓	✓	✓	✓	Accelerated discovery and innovation. Businesses can use cognitive systems to identify patterns and development hypotheses from vast mountains of data.
Artificial Intelligence and Machine Learning	19AI7304	Quantum Computing		✓	✓		The area of study is focused on the development of computer-based technologies centered around the principles of quantum theory.
Artificial Intelligence and Machine Learning	19AI7305	Web and Social media mining	✓	✓	✓	✓	Uncover hidden patterns and trends from social media platforms like Twitter, LinkedIn, Facebook, and others.
Artificial Intelligence and Machine Learning	19AI8301	Computational Neuroscience	✓	✓	✓	✓	Perform research in which they collect data and create computer models based on the electrical patterns and biological functions of the brain.
Artificial Intelligence and Machine Learning	19AI8302	Data Science	✓	✓	✓	✓	Vast volumes of data using modern tools and techniques to find unseen patterns, derive meaningful information, and make business decisions.
Artificial Intelligence and Machine Learning	19AI8303	Network Science and Modeling	✓	✓	✓	✓	Emerge approach in addressing complex relations in product and system designs and their interaction with broader product ecosystems.

Artificial Intelligence and Machine Learning	19AI8304	Reinforcement Learning		✓	✓	✓	Machine learning paradigm that does not require the raw data to be labeled, as is required typically with machine learning. Reinforcement learning helps determine if an algorithm is producing a correct right answer or a reward indicating it was a good decision.
Artificial Intelligence and Machine Learning	19AI8305	Stream Analytics	✓	✓	✓	✓	Process and analyze of data records continuously rather than in batches.
Artificial Intelligence and Machine Learning	19AI8306	Soft Computing in Medical Diagnostics	✓	✓	✓	✓	The large number of soft computing approaches have been applied for effectively diagnosing and predicting the diseases from healthcare data.
Artificial Intelligence and Machine Learning	19AI8307	Pattern Recognition Algorithms	✓	✓	✓	✓	Work with any type of data: images, texts, videos, or numbers. After receiving some information as the input, the algorithm starts to pre-process the data.
Artificial Intelligence and Machine Learning	19AI8308	Graph Analytics for Big Data	✓	✓	✓	✓	Provides companies with a clear view of data and operations and can be used to optimize the delivery of parcels, assess the robustness of a supply chain, or understand the business impact of a failure within a supply chain.
Artificial Intelligence and Machine	19AI8309	Optimization in ML	✓	✓	✓	✓	The machine learning project in addition to fitting the learning algorithm on the

Learning							training dataset.
Artificial Intelligence and Machine Learning	19AI8310	5G Network	✓	✓	✓		The kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices.
Artificial Intelligence and Machine Learning	19AI6401	Cyber Security and Intelligence	✓	✓	✓		Understand the Organizational Implications on Cyber Security.
Artificial Intelligence and Machine Learning	19AI7401	Business Analytics	✓	✓	✓	✓	Learn the fundamental concepts of business process and Analytics.

ME CAD/CAM

CoursesFocusonGlobal,National,RegionalandLocalNeeds

Programme	Course Code	Name of the Course	Needs				Description
			Global	National	Regional	Local	
CAD/CAM	20MA1104	Applied Mathematics for Engineers			✓	✓	Applied mathematics provides a framework for solving engineering problems.
CAD/CAM	20CC1201	Computer Aided Design			✓	✓	Apply parametric, associative, and feature-based modeling principles in design applications.
CAD/CAM	20CC1202	Integrated Mechanical Design		✓		✓	Design calculations are used to determine the shape and dimensions of a component.
CAD/CAM	20CC1203	Computer Aided Manufacturing	✓	✓			Create and program CNC machines according to manufacturing principles and numerical control principles.
CAD/CAM	20RM1153	Research Methodology and IPR		✓	✓	✓	The methods for writing technical papers and presentations without violating professional ethics.
CAD/CAM	20CC1001	Computer Aided Design Lab	✓	✓	✓	✓	Utilize hands-on training to create surface, two-dimensional and three-dimensional models of machine components in assembly software.

CAD/CAM	20CC1002	Computer Aided Manufacturing Lab		✓	✓	✓	Develop practical knowledge through the practice of CNC machines & related software, and develop part programs for various components.
CAD/CAM	20CC2201	Finite Element Analysis		✓	✓	✓	Analyze the behavior of various finite elements and apply them to solving physical and engineering problems.
CAD/CAM	20CC2202	Integrated Product and Processes Development	✓	✓	✓	✓	Knowledge of product planning, selection, and product architecture, as well as product architecture.
CAD/CAM	20CC2203	Design for Manufacture Assembly and Environment	✓	✓	✓	✓	Identify the various design aspects that need to be considered for manufacturing products using different processes, including information about recyclability and economy.
CAD/CAM	20CC2001	Computer Aided Engineering Lab	✓	✓	✓	✓	Provide hands-on training using ANSYS APDL simulators to understand the concepts of computational fluid dynamics.
CAD/CAM	20CC2002	Implant Training / Internship/ Mini Project	✓	✓	✓	✓	Apply their knowledge to real life situations in industrial organizations with ethical values and effective working practices.
CAD/CAM	20CC3901	Dissertation- I	✓	✓	✓	✓	Develop a solution to a Mechanical Engineering problem that is technically, economically, and environmentally feasible. Ensure that the project report, presentations, and final viva are prepared.

CAD/CAM	20CC4901	Dissertation- II	✓	✓	✓	✓	Develop a solution to a Mechanical Engineering problem that is technically, economically, and environmentally feasible. Ensure that the project report, presentations, and final viva are prepared.
CAD/CAM	20CC2301	Computer Aided Process Planning	✓	✓	✓	✓	Integrate sequential and concurrent engineering concepts with graphical process planning.
CAD/CAM	20CC2302	Additive Manufacturing	✓	✓	✓	✓	Develop a basic and advanced understanding of 3D printing, SDM, and BPM techniques in Additive Manufacturing.
CAD/CAM	20CC2305	Metrology and Non-Destructive Testing	✓	✓	✓	✓	Apply various inspection and measurement techniques utilizing Computer Aided Inspection to non-destructive evaluation, testing, and measurement methods.
CAD/CAM	20CC2306	Competitive Manufacturing Systems	✓	✓	✓	✓	Develop a working knowledge of lean and green manufacturing systems, just in time techniques, and automated production systems.
CAD/CAM	20CC2307	Design of Heat Exchanger	✓	✓	✓	✓	Analyze flow and stress in process heat exchangers, cooling towers, condensers, and evaporators.
CAD/CAM	20CC2308	Composite Materials and Mechanisms		✓	✓	✓	Analyze the design of fiber reinforced laminates and residual stresses in laminates during processing.

CAD/CAM	20CC3301	Mechatronics Applications in Manufacturing	✓	✓	✓	✓	Analyze the integration of mechatronics into modern manufacturing processes.
CAD/CAM	20CC3302	Industrial Safety Management	✓	✓	✓	✓	Identify safety principles that can prevent accidents that can lead to production losses in industry.
CAD/CAM	20CC3303	Supply Chain Management			✓	✓	Identify how logistics and supply chain management can be applied to sourcing, pricing, coordination, and network design.
CAD/CAM	20CC3304	Industrial Robotics and Expert Systems		✓	✓	✓	The kinematics of robots, the driving mechanisms of robots, sensors, and programming concepts should be identified.
CAD/CAM	20CC3305	Computational Fluid Dynamics	✓	✓	✓		Develop explicit & implicit algorithms for solving CFD equations and understand compressible and incompressible flow phenomena.
CAD/CAM	20CC3306	Vibration Analysis and Control	✓	✓	✓	✓	Experiment with various vibration measurement instruments to understand their working principles and operations.
CAD/CAM	20CC3307	Optimization Techniques in Design	✓	✓			Identify the basic concepts behind static and dynamic optimization techniques.
CAD/CAM	20CC3308	Tribology in Design	✓	✓	✓	✓	Analyze the material properties that affect the tribological characteristics of surfaces and surface treatment methods.

CAD/CAM	20CC3309	Advanced Tool Design	✓	✓	✓	✓	Identify design procedures for machining, tool design, jigs and fixtures, and dies for press tools.
CAD/CAM	20CC3310	Manufacturing – Online Course Nptel/EDX/Mooc	✓	✓	✓	✓	Examine the processes involved in scalable production, whether it's for toys or smartphones.
CAD/CAM	20CC3311	Design and Analysis of Thermal Energy Systems		✓		✓	Describe the principles of energyengineering analysis as they relate to air conditioners, oil piping, refrigeration, and fluid distribution systems.
CAD/CAM	20CC3312	Basics and applications for Internet ofThings			✓	✓	Develop a basic education curriculum that uses IOT concepts and integrates them into interactions between engineering, engineering technology, science, and industrial management in industry.
CAD/CAM	20CC3401	Micro Electro Mechanical Systems		✓	✓		Analyze several micro electromechanical systems, micromechanics concepts and their design considerations.
CAD/CAM	20CC3402	Quality –Online Course Nptel/EDX/Mooc	✓	✓	✓	✓	Analyze methods and develop systems to make products and services that meet or exceed the customer's expectations.
CAD/CAM	20AC1091	English for Research Paper Writing	✓	✓	✓	✓	Identify ways to improve writing skills, readability, and the quality of papers.
CAD/CAM	20AC1092	Disaster Management	✓	✓		✓	Develop a realistic understanding of humanitarian response standards, practical relevance, and the strengths and weaknesses

							of disaster management.
CAD/CAM	20AC1093	Sanskrit for Technical Knowledge		✓	✓		Developing logic in mathematics, science, and other subjects while enhancing memory power requires understanding the basic Sanskrit language.
CAD/CAM	20AC1094	Constitution of India		✓	✓		Understand liberty and freedom from a civil rights perspective, as well as how Indian opinion regarding Indian intellectuals' constitutional rights is growing.
CAD/CAM	20AC1095	Pedagogy Studies	✓	✓			Identify the ways in which teacher education (curriculum and practicum) and school curriculum and guidance materials can support effective teaching.
CAD/CAM	20AC2091	Value Education		✓	✓		An individual's self-development, values, and overall personality should be developed.
CAD/CAM	20AC2092	Stress Management by Yoga			✓	✓	Developing a healthy mind in a healthy body is the key to improving social health.
CAD/CAM	20AC2093	Personality Development ThroughLife Enlightenment Skills		✓	✓		Study enables students to reach their highest life goals by understanding the person who has studied it.
CAD/CAM	20AC2094	Unnat Bharat Abhiyan	✓	✓			The purpose of this project is to facilitate the connection between higher education institutions and local communities in order to address the development challenges of rural

							India.

ME APPLIED ELECTRONICS

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	**Course Code**	**Name of the Course**	**Needs**				**Description**
			Global	**National**	**Regional**	**Local**	
Applied Electronics	20MA1102	Advanced Mathematics For Electrical and Electronics Engineering	✓	✓	✓	✓	Provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of science and engineering.
Applied Electronics	20AE1201	Advanced Digital System Design	✓	✓	✓	✓	The emphasis is on FPGA technology, but most of the design techniques can also be applied to ASIC devices. Familiar with the latest state-of-the-art system on chip (SoC) design methodologies, including high-level synthesis and partial run-time reconfiguration.
Applied Electronics	20AE1202	Embedded System Design	✓	✓	✓	✓	Acquire a basic knowledge about fundamentals of microcontrollers. Acquire knowledge about devices and buses used in embedded networking. Acquire knowledge about Life cycle of embedded design and its

							testing.
Applied Electronics	20AE1203	Digital Image Processing	✓	✓	✓	✓	Various steps and techniques involved in Image processing.
Applied Electronics	20AE1204	Research Methodology	✓	✓	✓	✓	Demonstrate the ability to choose methods appropriate to research aims and objectives. Understand the limitations of research methods.
Applied Electronics	20AE1001	Electronic System Design Laboratory	✓	✓	✓	✓	Design different forms of power supply. Design Voltage regulators.
Applied Electronics	20AE1002	Embedded System Laboratory	✓	✓	✓	✓	Develop programs to add numbers in various number system representation. Develop a program to transfer and receive data from/to a PC serially. Familiarize with programming and interfacingmicrocontrollers to various devices.
Applied Electronics	20AE2201	Analog Integrated Circuit Design	✓	✓	✓	✓	Design and implementation details of wide-band amplifiers, operational amplifiers, filters, and basic data converters
Applied Electronics	20AE2202	VLSI Design Techniques	✓	✓	✓	✓	Design and testing of MOS circuits.

Applied Electronics	20AE2001	VLSI Design Laboratory	✓	✓	✓	✓	Leading the way through, VLSI and SoC Design Lab, has been oriented toward enabling students to gain engineering excellence in true sense.
Applied Electronics	20AE2901	Mini Project	✓	✓	✓	✓	Students will be able to practice acquired knowledge within the chosen area of technology for project development. Identify, discuss, and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
Applied Electronics	20AE3901	Dissertation I	✓	✓	✓	✓	Understand research methodology. Plan and execute Projects. Survey and review literature. Choose computational and analytical tools and design experiments. Communicate technical content orally as well as in writing with added skill.
Applied Electronics	20AE4901	Dissertation - II	✓	✓	✓	✓	Plan and manage projects with skill. Analyze results and acquire domain knowledge and use computational and analytical tools with skill and demonstrate skill in technical communication.
Applied Electronics	20AE2301	Advanced Digital Signal Processing	✓	✓	✓	✓	Comprehend the DFTs and FFTs. Design and analyze the digital filters and acquire the basics of multi rate digital signal processing analyze the power spectrum estimation.
Applied	20AE2302	Advanced Microprocessors and	✓	✓	✓	✓	Identify a detailed s/w & h/w structure of the Microprocessor to illustrate how the

Electronics		Microcontrollers					different peripherals (8255, 8253 etc.) are interfaced with Microprocessor and to distinguish and analyze the properties of Microprocessors & Microcontrollers.
Applied Electronics	20AE2303	ASIC and FPGA Design	✓	✓	✓	✓	Understand the basic strategies for hardware design using VHDL use computer aided design tools to synthesize a design written in VHDL and generate a bitstream for execution on an FPGA.
Applied Electronics	20AE2304	Computer Architecture and Parallel Processing	✓	✓	✓	✓	Demonstrate concepts of parallelism in hardware/software and discuss memory organization and mapping techniques.
Applied Electronics	20AE2305	CAD for VLSI Design	✓	✓	✓	✓	Demonstrate knowledge and understanding of fundamental concepts in CAD. Get the Overview of Physical Design of VLSI ICs and to get the Knowledge about Physical design of FPGA and MCMS.
Applied Electronics	20AE2306	Programming Languages for Embedded Software	✓	✓	✓	✓	Understand the concept of embedded system, microcontroller, different components of microcontroller and their interactions and get familiarized with programming environment to develop embedded solutions.
Applied Electronics	20AE2307	Electromagnetic Interference and Compatibility		✓	✓	✓	Diagnose and solve basic electromagnetic compatibility problems. Real-world EMC design constraints and make appropriate tradeoffs to achieve the most cost-effective design that meets all requirements.

							Understand the effect of EM noise in system environment and its sources.
Applied Electronics	20AE2308	Wireless Adhoc and Sensor Networks	✓	✓	✓	✓	Identify different issues in wireless ad hoc and sensor networks. To analyze protocols developed for ad hoc and sensor networks
Applied Electronics	20AE2309	Robotics and Intelligent Systems	✓	✓	✓	✓	Describe human intelligence and AI Explain how intelligent system works apply basics of Fuzzy logic and neural networks. Explain Expert System and implementation.
Applied Electronics	20AE3301	Intelligent Systems and Control	✓	✓	✓	✓	Know the advantages and drawbacks of intelligent controllers and therefore when to apply them understand how to derive, develop, and apply intelligent controllers
Applied Electronics	20AE3302	An Introduction to Electronics Systems Packaging	✓	✓	✓	✓	Model and characterize electrical, mechanical, and thermal behavior. Understand material science and materials selection and understand manufacturing processes relevant to electronic packaging. Develop statistical and data models to describe electronic package failure.
Applied Electronics	20AE3303	IOT System Design and Security			✓	✓	Understand the fundamental security issues in Internet of things and demonstrate different Frameworks and Hardware Architecture of IoT Device and protect and secure the network connecting IoT devices to back-end systems on the internet.

Applied Electronics	20AE3304	Hardware and Software Co-design	✓	✓	✓	✓	It outlines the basic strengths of hardware and software implementations, and shows how to combine those into a successful system design.
Applied Electronics	20AE3305	Electronics for solar Power	✓	✓	✓	✓	Understand the properties of solar energy resource, PV and ST system operation and component specifications.
Applied Electronics	20AE3306	PCB Design and Fabrication	✓	✓	✓	✓	Students can explore different aspect of Printed Circuit Board Design and fabrication.
Applied Electronics	20AE3401	Robotics	✓	✓	✓	✓	Explain the fundamentals of robotics and its components illustrate the Kinematics and Dynamics of robotics elucidate the need and implementation of related Instrumentation & control in robotics illustrate the movement of robotic joints with computers/microcontrollers.
Applied Electronics	20AE3402	Artificial intelligence and Optimization Techniques	✓	✓	✓	✓	Apply the basic principles, models, and algorithms of AI to recognize, model, and solve problems in the analysis and design of information systems.
Applied Electronics	20AC1091	English for Research Paper writing	✓	✓	✓	✓	Understand professional writing by studying management communication contexts and genres, researching contemporary business topics, analyzing quantifiable data discovered by researching, and constructing finished professional

							workplace documents.
Applied Electronics	20AC1092	Disaster Management		✓	✓	✓	Explain disaster management theory.
Applied Electronics	20AC1093	Sanskrit for Technical knowledge		✓	✓	✓	To get an in-depth knowledge of this ancient Indian Language and its Literature, Poetry, Dramaturgy, Grammar, and the History of its literature.
Applied Electronics	20AC1094	Value Education		✓	✓	✓	To understand the importance of value-based living. To gain deeper understanding about the purpose of their life and contribute in building a healthy nation
Applied Electronics	20AC1095	Constitution of India		✓	✓	✓	Understand the Indian constitution and Fundamental rights and Duties.
Applied Electronics	20AC2091	Pedagogy Studies		✓	✓	✓	Understand and select the best approaches to teaching and to develop a positive attitude towards life and teaching profession.
Applied Electronics	20AC2092	Stress Management by Yoga		✓	✓	✓	Foster resilience and cope with stressful situations at the workplace to increase their well-being; Improve their emotional intelligence to better deal with stress.
Applied	20AC2093	Personality Development	✓	✓	✓	✓	The person who has studied Geeta will lead the nation and mankind to peace and

Electronics		Through Life Enlightenment Skills					prosperity. Study of Neetishatakam will help in developing versatile personality.
Applied Electronics	20AC2094	Unnat Bharat Abhiyan	✓	✓	✓	✓	Speeding up indigenous, sustainable rural development with effective support from professional institutes of higher education.

ME COMMUNICATION SYSTEMS

Courses Focus on Global, National, Regional and Local Needs							
Programme	**Course Code**	**Name of the Course**	**Needs**				**Description**
			Global	**National**	**Regional**	**Local**	
Communication System	20MA1102	Advanced Mathematics for Electrical and Electronics Engineering	✓	✓	✓	✓	Provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of science and engineering.
Communication System	20CM1201	Digital Modulation and coding Techniques	✓	✓	✓	✓	Familiarize with all the key elements of a digital communication system and at a theoretical level can identify and quantify the factors that determine the performance of a digital communication system.

Communication System	20CM1202	Advanced Digital Signal Processing	✓	✓	✓	✓	Know the analysis of discrete time signals and to study the modern digital signal processing algorithms and applications.
Communication System	20CM1203	Optical Communication Networks	✓	✓	✓	✓	Apply the concept of optics and light wave in optical fiber link and fiber transmission characteristics. Analyze the different network access scheme and packet switching in OFC system.
Communication System	20CM1204	RF System Design	✓	✓	✓	✓	Able to understand basic mathematical tools required for analyzing RF systems and able to design planar devices and analyze their performance. Able to apply RF design concepts to Wireless technologies.
Communication System	20CM1205	Research Methodology and IPR	✓	✓	✓	✓	Understand the research problem and research process and prepare a well-structured research paper and scientific presentations and explore on various IPR components and process of filing.
Communication System	20CM1001	Signal Processing and Communication Laboratory	✓	✓	✓	✓	Apply knowledge of digital filter design for various applications and apply MultiMate concepts in different areas.

Communication System	20CM2201	Advanced Wireless Communication and Networks	✓	✓	✓	✓	Demonstrate their understanding on functioning of wirelesscommunication system and evolution of different wireless communication systems and standards. Explain the architecture, functioning, protocols, capabilities, and application of various wirelesscommunication networks.
Communication System	20CM2202	Microwave Integrated Circuits	✓	✓	✓	✓	Explain different types of waveguides and their respective modes of propagation. Analyze typical microwave networks using impedance, admittance, transmission and scattering matrix representations.
Communication System	20CM2001	Communication Networks Laboratory	✓	✓	✓	✓	Able to design and implement various network application such as data transmission between client and server, file transfer, real-time multimedia transmission. Understand the various Routing Protocols/Algorithms and Internetworking.
Communication System	20CM2002	Mini Project / Internship	✓	✓	✓	✓	Students will be able to practice acquired knowledge within the chosen area of technology for project development. Identify, discuss, and justify the technical aspects of the chosen project with a comprehensive

							and systematic approach.
Communication System	20CM3901	Project Phase I	✓	✓	✓	✓	Understand research methodology. Plan and execute Projects. Survey and review literature and choose computational and analytical tools and design experiments.
Communication System	20CM4901	Project Phase II	✓	✓	✓	✓	Plan and manage projects with skill. Analyze results and acquire domain knowledge. Use computational and analytical tools with skill and demonstrate skill in technical communication. Comprehend and disseminate knowledge.
Communication System	20CMX301	Information Theory and Coding Techniques	✓	✓	✓	✓	Define the amount of information per symbol and information rate of a discrete memory less source apply different channel coding techniques for error detection and correction schemes.
Communication System	20CMX302	*Signal Estimation for wireless communication	✓	✓	✓	✓	Various signal processing procedures in communication systems such as channel estimation, equalization, synchronization etc., which are also employed in MIMO-OFDM based 3G/ 4G wireless systems, are based on fundamental concepts in estimation theory.

Communication System	20CMX303	Vehicular systems and Networks	✓	✓	✓	✓	Adequate knowledge in vehicular networks. Ability to devise, select, and use modern techniques and tools needed for automotive electronic systems
Communication System	20CMX304	Advanced Radiation Systems	✓	✓	✓	✓	Describe the fundamentals to recent techniques in antenna technology and design and assess the performance of various antennas.
Communication System	20CMX305	Embedded and IOT	✓	✓	✓	✓	Describe the principles and various concepts of python programming and design and develop environmentally friendly IoT enabled devices using Python and appraise the configuration and control of Raspberry Pi controller circuits.
Communication System	20CMX306	Wireless Senor Networks	✓	✓	✓	✓	Learn the Routing and Security issues in Ad hoc and Sensor networks.
Communication System	20CMX307	Cognitive Radio Network	✓	✓	✓	✓	Describe the basics of the software defined radios and to learn the hardware and software architecture of software defined radio.
Communication System	20CMX308	Micro-Electro Mechanical Systems	✓	✓	✓	✓	Understand the operation of micro devices, micro systems, and their applications apply scaling laws that are used extensively in the conceptual design of micro devices.

							Simplify the design of micro devices, micro systems using the MEMS fabrication processand systems.
Communication System	20CMX309	High Speed Switching and Network	✓	✓	✓	✓	Compare and analyze the fundamental principles of various high speed communication networks and their protocol architectures. Examine the congestion control issues and traffic management in TCP/IP and ATM networks.
Communication System	20CMX310	Satellite Communication and Navigation	✓	✓	✓	✓	Gives a complete introductory overview of satellite communications and navigation and able to understand how analog and digital technologies are used for satellite communication networks.
Communication System	20CMX311	Massive MIMO and mm Wave Systems	✓	✓	✓	✓	Understand the 5G techniques e.g., massive MIMO. mm Wave etc. for the design of communication systems. Characterize and analyze various modulation and multiplexing techniques e.g., OFDM, NOMA etc.
Communication System	20CMX312	Machine Learning	✓	✓	✓	✓	Supervised learning, unsupervised learning, software applications to become more accurate at predicting outcomes without being explicitly programmed to do so and machine learning algorithms use historical data as input to predict new output

							values.
Communication System	20CMX313	Communication Protocol for IOT	✓	✓	✓	✓	Comprehend the essentials of IoT and its applications and understand the concepts of IoT Architecture Reference model and IoT reference architecture analyze various IoT Application layer Protocols.
Communication System	20CMX314	Speech Signal Processing	✓	✓	✓		Understand the speech production and perception process analyze speech signals in time and frequency domain, design and implement algorithms for processing speech signals.
Communication System	20CMX315	Multimedia Compression	✓	✓	✓	✓	Describes Social media sharing, Illustrate media content sharing. Outline media propagation in online social networks.
Communication System	20CMX316	Wavelets and Sub coding	✓	✓			Establish the theory necessary to understand and use wavelets and related constructions. Study applications in signal processing, communications, and sensing where time-frequency transforms like wavelets play an important role.
Communication System	20CMX317	Deep Learning	✓	✓	✓	✓	Understand the basics of Deep Learning and enable the students to know Deep Learning Techniques to

							support Real-Time Applications.
Communication System	20CMX318	Spread Spectrum communication	✓	✓	✓	✓	Apply the knowledge of statistical theory of communication and explain the conventional digital communication system.
Communication System	20CMX319	Block chain and its applications	✓	✓	✓	✓	Understand Blockchain's Fundamental Components, and Examine Decentralization Using Blockchain.
Communication System	20CMX320	5G Technology	✓	✓	✓	✓	Define and understand what the key 5G technologies are, why they are needed, and how they can shape future communication systems.
Communication System	20CM34XX	Green Communication	✓	✓	✓	✓	It focuses on green communications technologies, which are crucial to reduce the overall energy consumption and operational cost from both the environmental and business viewpoints.
Communication System	20CM34XX	Industrial IOT	✓	✓	✓	✓	Using the IoT solutions, the companies are tracking the assets, collecting data and analytics and also helping in control room consolidation.
Communication System	20AC1091	English for Research Paper writing	✓	✓	✓	✓	Understand professional writing by studying management communication contexts and genres,

							researching contemporary business topics, analyzing quantifiable data discovered by researching, and constructing finished professional workplace documents.
Communication System	20AC1092	Disaster Management	✓	✓	✓		Explain disaster management theory.
Communication System	20AC1093	Sanskrit for Technical knowledge		✓	✓	✓	Get an in-depth knowledge of this ancient Indian Language and its Literature, Poetry, Dramaturgy, Grammar, and the History of its literature.
Communication System	20AC1091	Pedagogy Studies		✓	✓		Understand and select the best approaches to teaching. Develop a positive attitude towards life and teaching profession and use the collaborative learning into a course in a way that aligns with students learning objectives and intended outcomes.
Communication System	20AC1095	Constitution of India		✓	✓	✓	Understand the Indian constitution and Fundamental rights and Duties.
Communication System	20AC2094	Value Education	✓	✓	✓	✓	Understand the importance of value-based living, to gain deeper understanding about the purpose of their life and to contribute in building a healthy nation.

Communication System	20AC2092	Stress Management by Yoga	✓	✓	✓	✓	Foster resilience and cope with stressful situations at the workplace to increase their well-being; Improve their emotional intelligence to better deal with stress;
Communication System	20AC2093	Personality Development Through Life Enlightenment Skills	✓	✓	✓	✓	The person who has studied Geeta will lead the nation and mankind to peace and prosperity study of Neetishatakam will help in developing versatile personality.
Communication System	20AC2094	Unnat Bharat Abhiyan	✓	✓	✓	✓	Speeding up indigenous, sustainable rural development with effective support from professional institutes of higher education.
Communication System	16ENX314	Green radio communication network	✓	✓	✓	✓	It serves as a one-stop reference for key concepts and design techniques for energy-efficient communications and networking and provides information essential for the design of future-generation cellular wireless systems.
Communication System	16ENX315	Information and network security	✓	✓	✓	✓	Network security is critical because it prevents cybercriminals from gaining access to valuable data and sensitive information.
Communication System	16ENX324/16 CM326	Cyber security	✓	✓	✓	✓	Cybersecurity is crucial because it safeguards all types of data against

							theft and loss.

ME COMPUTER SCIENCE AND ENGINEERING

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	**Course Code**	**Name of the Course**	**Needs**				**Description**
			Global	**National**	**Regional**	**Local**	
	22CS1151	Problem solving using C programming	✓	✓	✓	✓	Programming basics and the fundamentals of C, Data types in C,Mathematical and logical operations, Arranging data in arrays, Implementing pointers, File management and dynamic memory allocation
	22IT1152	Introduction to Web Application Development	✓	✓	✓	✓	Understand the development of a client-side browser based web application including its capabilities and limitations. Develop skills in client-side web application development technologies. Design a web application using web programming patterns based on data analytics to enhance the front end user experience.
	22CS1152	Object oriented programming using python	✓	✓	✓	✓	Understand the concepts of tuples, dictionary, identifiers exception handling concepts.

	22HE1073	Introduction to Soft Skills	✓	✓	✓	✓	Skill Development - A soft skills assessment can help illuminate areas where improving your skills can greatly improve the performance of your team, along with your own personal success. It'll also show you which soft skills you're strong in, so you can better understand how to teach those positive behaviors to others.
	22CS3201	Data Structures	✓	✓	✓	✓	Skill Development - Able to determine algorithm correctness and time efficiency class.Identify and analyze various criteria and specifications appropriate to new problems. develop efficient algorithms for the new problem with suitable designing techniques
	22CS3202	Operating Systems	✓	✓	✓	✓	Skill Development - Understand Process Scheduling, Memory management and device management techniques.
	22CS3203	Digital Principles And Computer Organization	✓	✓	✓	✓	Skill Development - Able to Simplify boolean functions using different methods.Design and implement combinational logic circuits and sequential logic circuits.
	22CS3251	Object Oriented Programming Using Java	✓	✓	✓	✓	Skill Development - Understand OOPs Principle , Packages and interfacing concepts. Understand Eventhandling and able to develop simple applets
	22CS3002	Operating Systems Laboratory	✓	✓	✓	✓	Skill Development - To provide necessary skills for developing and debugging programs in

							LINUX environment.
	22CS3003	Data Structures Laboratory	✓	✓	✓	✓	Skill Development - Acquire skills and knowledge in imperative programming. stacks, queues, lists, sets, trees, and algorithms such as searching, and sorting. concepts that help to design own algorithms. Understanding graph algorithms.
	22CS4201	Database Management Systems	✓	✓	✓	✓	Skill Development - Gain knowledge about various SQLs and optimization techniques.Understand Normalization.Understand Transaction models
	22CS4203	Software Design with UML	✓	✓	✓	✓	Skill development-understand about software development life cycle, srs document, testing,unified modeling language
	22CS4001	Database Management Systems Laboratory	✓	✓	✓	✓	Skill Development - Familiarize, DDL and DML Statements,Understand PL/SQL Statements.
	22CS4251	Design and Analysis of Algorithms	✓	✓	✓	✓	Skill Development - Understand general techniques for analzying algorithm. Understand different algorithmic design techniques
	21CS5201	Theory of Computing	✓	✓	✓	✓	Skill Development - Understands to Design finite state machine and prove the equivalence between regular expression and finite automata. Able to derive a grammar for the given language and to design pushdown automata for given language. Able to design Turing machine for given language. Able to distinguish Decidability and Un-decidability for real time problems.
	21CS5202	Computer Networks	✓	✓	✓	✓	Skill Development - Understand different types of networks, the data communication system and the purpose of layered architecture .

							Understand the concepts of Routing methods and Subnetting.Interpret thr mechanism of Congestion control Connection methods . Understand various protocols used for heterogenous Application.
	21EC5231	Principles of Microprocessors and Micro Controllers	✓	✓	✓	✓	Employability - Demonstrate ability to handle string instructions using assembly language programming in TASM.Demonstrate ability to handle sorting operations and using assembly language programming in TASM. study parallel and serial communication using 8051 micro controller.
	21CS5252	Object Oriented Analysis and Design	✓	✓	✓	✓	Skill Development - understand about UML diagrams and case tools ,Analyze and design software requirements in efficient manner. Construct various UML models using the appropriate notation using the Rational Software Suite.
	21CS5351	Internet and Web Technology	✓	✓	✓	✓	Employability -Understand the basics of HTML and CSS. Understand Server side and client side scripting techniques. Gain knowledge on XML and web services.
	21CS5352	Advanced Java Programming	✓	✓	✓	✓	Skill Development - Understand OOPs Principle , Packages and interfacing concepts. Understand Eventhandling and able to develop simple applets
	21CS5353	Fundamentals of Open Source Software	✓	✓	✓	✓	Skill development- learn about open source linux os, python , php, mysql, lamp and wamp server, numpy tools
	21CS5354	R Programming	✓	✓	✓	✓	Employability - Apply OOP concepts in R programming. Explain the use of data structure and loop functions. Analyse data and generate

							reports based on the data.
	21CS6181	Principles of Management	✓	✓	✓	✓	Skill Development-Understand the principles and concepts of management. Carry out the process of planning and decision making on employment. Perform organizing, departmentation, Recruitment and training in various organizations.
	21CS6201	Artificial Intelligence	✓	✓	✓	✓	Employability- Acquire the fundamentals of Artificial Intelligence and Environment of the Intelligent Agents. Understand various machine learning algorithms used in Artificial Intelligence. knowledge of fundamental concepts of NLP. Acquired the fundamental knowledge of Neural Networks. Able to understand the Reinforcement Learning and its features.
	21CS6252	Mobile Computing and Application Development	✓	✓	✓	✓	Employability - Intepret the components of Mobile Operating Systems Understand the various schemes in MAC protocol and demonstrate the functionalities of Mobile IP protocols Understandsthe routing and security issues in Ad hoc and Sensor networks
	21CS6251	Compiler Design	✓	✓	✓	✓	Skill development- understand about principles provide an in-depth view of translation and optimization process. Compiler design covers basic translation mechanism and error detection & recovery. It includes lexical, syntax, and semantic analysis as front end, and code generation and optimization as back-end
	21IT6003	Project Based Learning	✓	✓	✓	✓	Employment Enhancement Course - Understand, plan and execute a Mini Project with team. Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.

							Reproduce, improve and refine technical aspects for engineering projects. Work as an individual or in a team in development of technical projects. Communicate and report effectively project related activities and findings.
	21CS6301	Business Intelligence – Data Warehousing and Analytics	✓	✓	✓	✓	Employability - Identify, design and develop analytical information systems, such as Business Intelligence with a descriptive analysis on data warehouses.
	21CS6302	Embedded Systems	✓	✓	✓	✓	Skill development - Understand the effect of different control modes on various processes; Analyze and verify the complex multi loop control system characteristics.
	21CS6304	Big Data Analytics and Tools	✓	✓	✓	✓	Employability - Design of Algorithms to solve Data Intensive Problems using Map Reduce Paradigm.
	21CS6305	Soft Computing	✓	✓	✓	✓	Skill Development - Understand the concepts of ANN, different features of fuzzy logic and their modelling, control aspects and different hybrid control schemes. Understand the basics of artificial neural network. Remember the modelling and control of neural network.
	21CS6701	Internship Training	✓	✓	✓	✓	Employability - Explore career alternatives prior to graduation. Integrate theory and practice. Assess interests and abilities in their field of study. Develop work habits and attitudes necessary for job success.
Computer Science and Engineering	20MA1103	Mathematical foundation of CSE	✓	✓	✓	✓	Application of LP problems, Simulation Techniques, and testing hypothesis.
Computer	20CP1201	Advance Data	✓	✓	✓	✓	Understanding the Data structures and

Science and Engineering		Structures					knowledge on the space and time efficiency of algorithms.
Computer Science and Engineering	20CP1202	Advanced Database Management System	✓	✓	✓	✓	Learning the fundamentals of data base management systems.
Computer Science and Engineering	20CP1203	Software Architecture	✓	✓	✓	✓	Learning the fundamental organization of a system and more simply defines a structured solution and it defines how components of a software system are assembled, their relationship and communication between them.
Computer Science and Engineering	20RM1161	Research Methodology and IPR		✓	✓	✓	Understand the research problem and research process.: Prepare a well-structured research paper and scientific presentations. Explore on various IPR components and process of filing.
Computer Science and Engineering	20CP1001	Advance Data Structures Laboratory	✓	✓	✓	✓	Building a solid foundation in algorithms and their applications.
Computer Science and Engineering	20CP1002	Advanced Database Management System Laboratory	✓	✓	✓	✓	Understanding data definitions and data manipulation commands.
Computer Science and Engineering	20CP2201	Advanced algorithms	✓	✓	✓	✓	Advanced algorithms build upon basic ones and use new ideas and will start with networks flows which are used in more typical applications such as optimal matchings, finding disjoint paths and flight scheduling as

							well as more surprising ones like image segmentation in computer vision.
Computer Science and Engineering	20CP2202	Cloud Computing Technologies	✓	✓	✓	✓	Distribute communication and distributed resource management and Familiarize the basics of cloud computing, virtualization techniques and cloud securities and standards.
Computer Science and Engineering	20CP2251	Machine learning Techniques	✓	✓	✓	✓	Supervised learning, unsupervised learning, software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.
Computer Science and Engineering	20CP2001	Advanced Algorithms Laboratory			✓	✓	The fundamental design, analysis, and implementation of basic data structures.
Computer Science and Engineering	20CP2002	Internship / Mini Project	✓	✓	✓	✓	Students will be able to practice acquired knowledge within the chosen area of technology for project development and identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
Computer Science and Engineering	20CP3901	Project Phase I	✓	✓	✓	✓	Understand research methodology. Plan and execute Projects. Survey and review literature. Choose computational and analytical tools and design experiments. Communicate technical content orally as well as in writing with added skill.

Computer Science and Engineering	20CP4901	Project Phase II	✓	✓	✓	✓	Plan and manage projects with skill and analyze results and acquire domain knowledge. Use computational and analytical tools with skill. Demonstrate skill in technical communication. Comprehend and disseminate knowledge.
Computer Science and Engineering	20CP2301	Agent Based Intelligent Systems	✓	✓	✓	✓	In agent-based modeling, a system is modeled as a collection of autonomous decision-making entities called agents and each agent individually assesses its situation and makes decisions based on a set of rules.
Computer Science and Engineering	20CP2302	Multicore Architecture	✓	✓	✓	✓	Multicore refers to an architecture in which a single physical processor incorporates the core logic of more than one processor.
Computer Science and Engineering	20CP2303	Software Design Patterns	✓	✓	✓	✓	Software design pattern is a general, reusable solution to a commonly occurring problem within a given context in software design.
Computer Science and Engineering	20CP2304	Compiler Optimization Techniques	✓	✓	✓	✓	Compiler optimization is generally implemented using a sequence of optimizing transformations, algorithms which take a program and transform it to produce a semantically equivalent output program that uses fewer resources or executes faster.
Computer Science and Engineering	20CP2305	Distributed Operating Systems		✓	✓	✓	Distributed operating system is system software over a collection of independent software, networked, communicating, and physically separate computational nodes. They handle jobs which are serviced by multiple

							CPUs.
Computer Science and Engineering	20CP2306	Software Process and Project Management		✓	✓	✓	Dedicated to the planning, scheduling, resource allocation, execution, tracking, and delivery of software and web projects.
Computer Science and Engineering	20CP3302	Image Processing and Analysis		✓	✓	✓	Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it. It is a type of signal processing in which input is an image and output may be image orcharacteristics/features associated with that image.
Computer Science and Engineering	20CP3303	Data Mining Techniques	✓	✓	✓		Data mining includes the utilization of refined data analysis tools to find previously unknown, valid patterns and relationships in huge data sets.
Computer Science and Engineering	20CP3304	Deep Learning Techniques	✓	✓	✓	✓	Deep learning is a machine learning technique that teaches computers to do what comes naturally to humans: learn by example. Deep learning is a key technology behind driverless cars, enabling them to recognize a stop sign, or to distinguish a pedestrian from a lamppost.
Computer Science and Engineering	20CP3305	Soft Computing Techniques	✓	✓	✓	✓	Soft computing is based on techniques such as fuzzy logic, genetic algorithms, artificial neural networks, machine learning, and expert systems.

Computer Science and Engineering	20CP3306	Linguistic Computing	✓	✓	✓	✓	Scientific and engineering discipline concerned with understanding written and spoken language from a computational perspective, and building artifacts that usefully process and produce language, either in bulk or in a dialogue setting.
Computer Science and Engineering	20CP3307	Advanced Cryptography Techniques	✓	✓	✓		Cryptographic techniques which can be used to maintain the confidentiality of information processed by computers are dealt with
Computer Science and Engineering	20CP3401	Data Science for Engineers (NPTEL)	✓	✓	✓	✓	Data science is to construct the means for extracting business-focused insights from data. This requires an understanding of how value and information flows in a business, and the ability to use that understanding to identify business opportunities.
Computer Science and Engineering	20CP3402	Cyber Security	✓	✓	✓	✓	Cyber security can be described as the collective methods, technologies, and processes to help protect the confidentiality, integrity, and availability of computer systems, networks and data, against cyber-attacks or unauthorized access.
Computer Science and Engineering	20AC1091	English for Research Paper writing		✓	✓	✓	Understand professional writing by studying management communication contexts and genres, researching contemporary business topics, analyzing quantifiable data discovered by researching, and constructing finished professional workplace documents.

Computer Science and Engineering	20AC1092	Disaster Management		✓	✓		Explain disaster management theory.
Computer Science and Engineering	20AC1093	Sanskrit for Technical knowledge	✓	✓	✓	✓	Get an in-depth knowledge of this ancient Indian Language and its Literature, Poetry, Dramaturgy, Grammar, and the History of its literature.
Computer Science and Engineering	20AC1094	Pedagogy Studies	✓	✓	✓	✓	Understand and select the best approaches to teaching and develop a positive attitude towards life and teaching profession. Use the collaborative learning into a course in a way that aligns with students learning objectives and intended outcomes.
Computer Science and Engineering	20AC1095	Constitution of India		✓	✓	✓	Understand the Indian constitution and Fundamental rights and Duties.
Computer Science and Engineering	20AC2091	Value Education	✓	✓	✓	✓	Understand the importance of value-based living and gain deeper understanding about the purpose of their life contribute in building a healthy nation.
Computer Science and Engineering	20AC2092	Stress Management by Yoga	✓	✓	✓	✓	Foster resilience and cope with stressful situations at the workplace to increase their well-being; Improve their emotional intelligence to better deal with stress.
Computer Science and	20AC2093	Personality Development Through Life		✓	✓		The person who has studied Geeta will lead the nation and mankind to peace and prosperity. Study of Neetishatakam will help in

Engineering		Enlightenment Skills					developing versatile personality.
Computer Science and Engineering	20AC2094	Unnat Bharat Abhiyan			✓	✓	Speeding up indigenous, sustainable rural development with effective support from professional institutes of higher education.
Computer Science and Engineering	19CS7901	Project Phase I					-Demonstrate a sound technical knowledge of their selected project topic. Undertake problem identification, formulation and solution. Design engineering solutions to complex problems utilising a systems approach. Conduct an engineering project. Communicate with engineers and the community at large in written an oral forms. Demonstrate the knowledge, skills and attitudes of a professional engineer.
Computer Science and Engineering	19CS8901	Project Phase II					Demonstrate a sound technical knowledge of their selected project topic. Undertake problem identification, formulation and solution. Design engineering solutions to complex problems utilising a systems approach. Conduct an engineering project. Communicate with engineers and the community at large in written an oral forms. Demonstrate the knowledge, skills and attitudes of a professional engineer.
Computer Science and Engineering	16CP2201	Research Methodology	✓	✓	✓	✓	A research methodology gives research legitimacy and provides scientifically sound findings. It also provides a detailed plan that helps to keep researchers on track, making the

							process smooth, effective and manageable.
Computer Science and Engineering	16CP2304	Network and Information Security	✓	✓	✓	✓	Network security is important for home networks as well as in the business world. Most homes with high-speed internet connections have one or more wireless routers, which could be exploited if not properly secured.
Computer Science and Engineering	16CP3309	Green Computing	✓	✓	✓	✓	The key mission of green computing is to reduce energy consumption. This not only cuts energy costs for organizations, but it also reduces the carbon footprint, particularly of IT assets.

MASTER OF COMPUTER APPLICATIONS

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	**Course Code**	**Name of the Course**	**Needs**				**Description**
			Global	**National**	**Regional**	**Local**	
Master of Computer Applications	21CA1291	PoP& OOPS	✓	✓	✓	✓	Understand the basics concepts in C programming and apply arrays and pointers in C. Gain knowledge in fundamentals of Object-Oriented Programming. and explore advanced features of object-oriented programming

Master of Computer Applications	21CA1292	Fundamentals Of Web Designing	✓	✓	✓	✓	Introduction to fundamentals of Internet, and the principles of web design. Construct basic websites using HTML, Cascading Style Sheets and Javascript
Master of Computer Applications	21CA1091	PoP& OOPS LAB	✓	✓	✓	✓	Understand the fundamental properties of C Language. Iimplementing data structures sorting and searching algorithms. Understand the syntax of C++ and write simpleto advanced programs.
Master of Computer Applications	21MA1101	Probability And Statistics, Operations Research	✓	✓	✓	✓	Develop LPP models for shortest path, minimal cost flow and critical path, and decision making using statistical tests.
Master of Computer Applications	21CA1201	UI Design & Development	✓	✓	✓	✓	Designs applications based on front end users.
Master of Computer Applications	21CA1202	Computer Networks			✓	✓	Summarizes about system connections and security measures.
Master of Computer Applications	21CA1203R	Java Programming		✓	✓	✓	Computes rich applications based on IO, files, JDBC and System Utility Classes.
Master of Computer Applications	21CA1204	Database Management Systems		✓	✓	✓	Outlines about data base storages, methods and CURD applications.

Master of Computer Applications	21CA1001	Java Programming Lab	✓	✓	✓	✓	Construct programs for simple problems and window applications.
Master of Computer Applications	21CA1002	DBMS Lab	✓	✓	✓	✓	Practices CURD applications based on SQL queries.
Master of Computer Applications	21CA1171	Communicative Skill for Business English	✓	✓			Improve the quality of language teaching through the use of systematic planning, development, and review practices in all aspects of a language program.
Master of Computer Applications	21CA2291	Software Engineering	✓	✓	✓	✓	Understand and practice the various fields such as analysis, design, development, testing of software Engineering.
Master of Computer Applications	21CA2292	Operating System	✓	✓	✓	✓	understand the various functionalities and structures of operating systems, with a focus on process management and scheduling algorithms. Describe the key components and concepts that contribute to the effective functioning of an operating system.
Master of Computer Applications	21CA2091	Software Engineering Tools Lab	✓	✓	✓	✓	Build DFD models. Understand and develop various structure and behavior UML diagrams. knowledge of project management tool
Master of Computer Applications	21CA2201	Data Structures and Algorithms		✓		✓	Understand the core topics of data structures and to unleash the concepts of linear data structures.

Master of Computer Applications	21CA2251	Web Development		✓	✓	✓	Employability- Make use of basics of Javascript and importance of MERN stack. Develop API with express Framework. Design Frontend component using ReactJS. Design and Develop backend component using Node JSand database using MangoDB
Master of Computer Applications	21CA2203	Python Programming	✓	✓	✓	✓	Perform Exploratory Data Analysis, Data Preparation, Preprocessing and model development.
Master of Computer Applications	21EC2251	Electronics for Embedded System	✓	✓	✓		Skill Development - Learn the fundamentals of basic electron devices. Studythe instruction set and operations of 8051 Microcontroller. Insight for embedded syste design and IoT
Master of Computer Applications	21CA2171	L/S/MOOC	✓	✓	✓	✓	Learns Life skill courses in NPTEL.
Master of Computer Applications	21CA2001	Python Programming Lab		✓	✓		Develop Model for Machine Learning Algorithms.
Master of Computer Applications	21CA2002	Data Structures & Algorithms Lab			✓	✓	Understand the system with various testing techniques and strategies.
Master of Computer Applications	21CA2801	Internship / Industrial Training		✓	✓	✓	Explore career alternatives prior to graduation and to integrate theory and practice to assess interests and abilities in

							their field of study.
Master of Computer Applications	21CA2301	Cyber Security	✓	✓	✓	✓	Understand the concept of Cyber Security.
Master of Computer Applications	21CA2302	Green Computing	✓	✓	✓	✓	Receive knowledge about Green Computing.
Master of Computer Applications	21CA2303	Human Computer Interaction	✓	✓	✓	✓	Identifies the process of machine and human interactions.
Master of Computer Applications	21CA2304	Professional Ethics		✓	✓		Understand the laws and regulations.
Master of Computer Applications	21CA2305	Web Graphics			✓	✓	Understands designing concepts.
Master of Computer Applications	21CA2306	Digital Logic and Computer Organization	✓	✓	✓		States the links and Logical Operations.
Master of Computer Applications	21CA2307	E-Learning Techniques	✓	✓	✓	✓	Analyse phases of activities in the model of E-Learning. Identify appropriate methods and delivery strategy. Adapt interactive E-Learning platforms
Master of Computer	21CA2308	Block Chain		✓	✓		Describes the concepts of block chain.

Applications		Technologies					
Master of Computer Applications	21CA3203R	Web Development	✓	✓	✓	✓	Build program for web applications.
Master of Computer Applications	21CA3205	Cryptography and Network Security		✓	✓	✓	understand necessary Approaches and Techniques to build protection mechanisms in order to secure computer networks.Secure system design and apply methods for authentication, access control, intrusion detection and be able to use them
Master of Computer Applications	21CA3251	Data Science and Analytics		✓	✓	✓	Familiar with different types of data and Exploratory Data Analysis and its implementation methods and knowledge to experiment with Machine Learning models for Analysis
Master of Computer Applications	21EC3251	Internet of Things		✓	✓	✓	To Learn the basic and Advanced Features of Open Source Big Data Tools and Frameworks
Master of Computer Applications	21CA3571	L/S/MOOC	✓	✓	✓	✓	Learns Life skill courses in NPTEL.
Master of Computer Applications	21CA3001	Mini Project Lab	✓	✓	✓	✓	Develop creative or innovative project.
Master of Computer	21CA3002	Web Development	✓	✓	✓	✓	Build program for web applications.

Applications		Lab					
Master of Computer Applications	21CA3301	Accounting and Financial Management		✓	✓		Recognizes the basic accounting concepts.
Master of Computer Applications	21CA3302	Cloud Computing and Security	✓	✓	✓	✓	Identifies the usage of cloud and its applications.
Master of Computer Applications	21CA3303	SoftComputing Techniques		✓	✓		Gain Knowledge of Soft Computing theories and its fundamentals. Design a soft computing system required to address a computational task.
Master of Computer Applications	21CA3304	Deep Learning	✓	✓	✓	✓	Sketches the algorithms used in deep learning.
Master of Computer Applications	21CA3305	E- Commerce	✓	✓	✓	✓	Establishes the basic and strategies of online deals and transactions.
Master of Computer Applications	21CA3306	Mixed Reality	✓	✓	✓	✓	Understands mixed reality.
Master of Computer Applications	21CA3307	Organizational Behavior	✓	✓			Illustrates the managerial procedures, principles, and ethics of organizations.
Master of Computer	21CA3308	Research		✓	✓		Outlines research procedures and IPR.

Applications		Methodology					
Master of Computer Applications	21CA3309	Semantic Web Services	✓	✓	✓		Describes web services.
Master of Computer Applications	21CA4901	Project Work		✓	✓	✓	Individual projects for technical skill development based on company requirement.

MASTER OF BUSINESS ADMINISTRATION

CoursesFocusonGlobal,National,RegionalandLocalNeeds							
Programme	**Course Code**	**Name of the Course**	**Needs**				**Description**
			Global	**National**	**Regional**	**Local**	
Master of Business Administration	20BA1201	Business Organization & Management	✓	✓	✓	✓	Understand the various forms of an organization and apply the appropriate Strategies for an organization and display their managerial skills.
Master of Business Administration	20BA1202	Managerial Economics	✓	✓	✓	✓	Understand and apply the key managerial economic concepts in business Decisions.
Master of Business Administration	20BA1203	Accounting for Managers	✓	✓	✓	✓	Apply the basic accounting principles in the preparation of financial statements and analysis.

Master of Business Administration	20BA1204	Quantitative Methods for Management	✓	✓	✓	✓	Understand relevance and need of quantitative methods for making business decisions.
Master of Business Administration	20BA1205	Organizational Behavior		✓	✓	✓	Understand the impact of individual behavior on organization's performance.
Master of Business Administration	20BA1206	Legal Aspects of Business			✓	✓	Understand the legal aspects relating to business.
Master of Business Administration	20BA1001	Business Application Lab - I	✓	✓	✓	✓	Understand the Applications of MS-Excel functions in business.
Master of Business Administration	20BA1002	Managerial Skill Development - I	✓	✓	✓	✓	Practice the managerial skills like listening, reading, writing, and speaking.
Master of Business Administration	20BA1701	Social Immersion Project	✓	✓	✓	✓	Identify the importance of solving societal issues.
Master of Business Administration	20BA2201	Operations Management	✓	✓	✓	✓	Understand the concepts, techniques and challenges of production and operations management.
Master of Business Administration	20BA2202	Financial Management	✓	✓	✓	✓	Understand the role of finance manager in an organization.

Master of Business Administration	20BA2203	Marketing Management	✓	✓	✓	✓	Learn the skills required for marketing function.
Master of Business Administration	20BA2204	Human Resource Management	✓	✓	✓	✓	Understand the role of human resources and interpreting the HR Policies towards the industries.
Master of Business Administration	20BA2205	Quantitative Techniques	✓	✓		✓	Develop LPP models for shortest path, minimal cost flow and critical path.
Master of Business Administration	20BA2206	Business Research Methods		✓	✓	✓	Understand the various tools and types of research.
Master of Business Administration	20BA2001	Business Application Lab -II		✓	✓	✓	Understand the basics of excel and an overview about importing data and using hyperlink.
Master of Business Administration	20BA2002	Managerial Skill Development - II		✓	✓	✓	Understand basic features of MS and G-Suite their Applications in Managerial Decision Making.
Master of Business Administration	20BA2701	Rural Innovation project	✓	✓	✓	✓	Create awareness on the study of rural market.
Master of Business Administration	20BA3201	Strategic Management	✓	✓	✓		Create knowledge and understanding of the strategic management concepts.

Master of Business Administration	20BA3202	International Business Management	✓		✓	✓	Get acquainted with the global strategic management Practices and functional domain practices.
Master of Business Administration	20BA3001	Data Analysis and Business Modelling Lab		✓	✓	✓	Understand the applications statistical tools in business research.
Master of Business Administration	20BA3701	Summer Internship			✓	✓	Student can get practical knowledge from industry.
Master of Business Administration	20BA3702	Managerial Skill Development - III	✓	✓			Develop collaborative capacity, perspective coordination, contextual thinking, and decision-making process.
Master of Business Administration	20BA3703	Online Certification/Conference Certification			✓	✓	Acquire additional knowledge and skills through MOOC courses.
Master of Business Administration	20BA4201	Indian Ethos and Values		✓	✓	✓	Application of Indian value system in management practices.
Master of Business Administration	20BA4701	Project Internship	✓	✓	✓		Find the solution to the problems in industry through research.
Master of Business Administration	20BA4702	Conference/Online /National/ International Certification	✓	✓	✓	✓	Encourage the students to participate and present papers in national and international conference.

		Program					
Master of Business Administration	20BAX301	Integrated Marketing Communication	✓	✓			Enable the students to understand influence of integrated marketing communication and the latest trends evolving.
Master of Business Administration	20BAX302	Customer Relationship Management		✓	✓		Develop a CRM process and implement the same.
Master of Business Administration	20BAX303	Brand Management	✓	✓	✓	✓	Develop the process and methods of brand management, including how to establish brand image and identity.
Master of Business Administration	20BAX304	Retail Management	✓		✓	✓	Develop retail location and plan the retails operation.
Master of Business Administration	20BAX305	Services Marketing	✓	✓		✓	Comprehend the unique challenges of services marketing, including the elements of product, price, place, promotion, processes, physical evidence, and people.
Master of Business Administration	20BAX306	Consumer Behaviour	✓	✓	✓	✓	Demonstrate how knowledge of consumer behavior can be applied to marketing.
Master of Business Administration	20BAX307	International Marketing	✓	✓	✓	✓	Develop an understanding of nuances related to international marketing.
Master of Business	20BAX308	Equity Research & Portfolio	✓	✓	✓	✓	Understand the various alternatives

Administration		Management					available for investment.
Master of Business Administration	20BAX309	Financial & Insurance Services	✓	✓	✓	✓	Analyze the role of Merchant Bankers, SEBI, NBFC and Mutual funds and other financial markets in India.
Master of Business Administration	20BAX310	Banking Regulation & Services	✓	✓	✓	✓	Learn the Regulatory framework related to Banking Regulations.
Master of Business Administration	20BAX311	International Financial Management	✓	✓	✓	✓	Analyze International Financial Management Environment.
Master of Business Administration	20BAX312	Financial Derivatives	✓	✓	✓	✓	Understand the methods of derivative contracts.
Master of Business Administration	20BAX313	Behavioural Finance	✓	✓	✓	✓	Evaluate the main results in the field of behavioral finance on financial market processes including market anomalies.
Master of Business Administration	20BAX314	Personnel & Interpersonal Effectiveness	✓	✓	✓	✓	Make students conversed with interpersonal relationships and can analyze the cultural differences in interpersonal communication.
Master of Business Administration	20BAX315	Talent Management	✓	✓	✓	✓	Explore the various approaches to implement best practices of talent management within an organization.
Master of Business	20BAX316	Industrial Relations &Labour	✓	✓	✓	✓	Understand the industrial relation systems in India and as well as at International level.

Administration		Legislations					
Master of Business Administration	20BAX317	Organizational Development	✓	✓	✓	✓	Gain an insight into the organizational development programmers and the components of OD.
Master of Business Administration	20BAX318	International HRM	✓	✓	✓	✓	Help students to focus on staffing strategies in international context.
Master of Business Administration	20BAX319	Strategic HRM	✓	✓	✓	✓	Understand perspective of strategic human resource management.
Master of Business Administration	20BAX320	Manpower Planning, Recruitment, and Selection	✓	✓	✓		Understand perspective of strategic human resource management.
Master of Business Administration	20BAX321	Team Dynamics at Work		✓	✓	✓	Analyze the implications of group dynamics.
Master of Business Administration	20BAX322	Data Visualization for Managers	✓	✓	✓	✓	Understand and select the right tool for data visualization and graphics.
Master of Business Administration	20BAX323	Business Intelligence	✓	✓	✓	✓	Understand the basics of business intelligence and business analytics.
Master of Business	20BAX324	Big Data Analytics		✓	✓	✓	Understand the basic of big data in business

Administration							decisions.
Master of Business Administration	20BAX325	HR and Finance Analytics		✓	✓		Understanding on human resource analytics, its role and importance.
Master of Business Administration	20BAX326	Marketing Analytics	✓	✓	✓	✓	Understanding on marketing analytics and sources of data for analytics.
Master of Business Administration	20BAX327	Innovation and Technology Management	✓	✓	✓	✓	Update knowledge on technological changes and innovative business solutions for firm's sustainable development.
Master of Business Administration	20BAX328	Lean and Agile Manufacturing Systems	✓	✓	✓	✓	Apply the tools in lean manufacturing to analyses a manufacturing system and plan for its improvements.
Master of Business Administration	20BAX329	Total Quality Management		✓	✓		Make students learn the application of techniques in implementing TQM.
Master of Business Administration	20BAX330	Logistics and Supply Chain Management	✓	✓	✓	✓	Comprehend the components of the logistics system.
Master of Business Administration	20BAX331	Operations Strategy	✓	✓	✓	✓	Visualize the concept of strategy formulation and the importance of operations strategy in business.
Master of Business	20BAX332	Sales and Operations	✓	✓	✓	✓	To have appreciable knowledge on the sales and operational planning across different

Administration		Planning					industries.
Master of Business Administration	20BAX333	Sourcing Management		✓	✓	✓	Visualize the process of sourcing for different industries.
Master of Business Administration	20BAX334	Quality Toolkit for Managers	✓	✓	✓	✓	Impart the basic concepts in Quality Management.
Master of Business Administration	20BAX335	Logistics Management			✓	✓	Understand the different aspects of logistics and create awareness about the scope of logistics in developing a career.
Master of Business Administration	20BAX336	Export Import Trade & Documentation		✓	✓	✓	Understand the documentation procedure followed for exports and imports.
Master of Business Administration	20BAX337	Supply Chain Management	✓	✓	✓	✓	Understand the various processes in SCM for improving distribution network in organizational performance.
Master of Business Administration	20BAX338	International Logistics & Shipping Management	✓	✓	✓	✓	Learn the current issues for the design and evaluation of an international logistics system.
Master of Business Administration	20BAX339	Supply Chain Analytics		✓	✓	✓	Visualize the huge opportunity that exists in supply chain analytics.
Master of Business	20BAX340	Design and Change in	✓	✓			Learn Organization design structures and

Administration		Organizations					its effectiveness.
Master of Business Administration	20BAX341	Planning, Structuring, and Financing Small Business	✓	✓			Appreciable knowledge on the techniques in managing small business.
Master of Business Administration	20BAX342	Business Plan Preparation for SmallBusiness	✓	✓	✓	✓	Identify and understand a clear marketing plan for business.
Master of Business Administration	20BAX343	Marketing for Small Business	✓	✓	✓	✓	Understand the importance of social media marketing for small business success.
Master of Business Administration	20BAX344	Finance and Accounting for Small Business	✓	✓	✓	✓	Comprehend the technique of making decisions related to taxation of small business.
Master of Business Administration	20BAX350	Electronic Commerce.	✓	✓	✓	✓	Understand the ethical, social, and security issues of information systems.
Master of Business Administration	20BAX351	System Analysis and Design	✓	✓	✓	✓	Comprehend the problem-solving methods in systems development.
Master of Business Administration	20BAX352	Enterprises Resource Planning		✓			Understand ERP its role in integrating business functions.

Master of Business Administration	20BAX353	Business Analytics	✓	✓	✓		Gain knowledge about various Business Intelligence Architectures and its new trends.
Master of Business Administration	20BAX354	Software Project Management	✓	✓	✓	✓	Visualize the basic concepts of project management.
Master of Business Administration	20BAX355	Tourism Management	✓	✓	✓	✓	Visualize the concept tourism - both domestic and international.
Master of Business Administration	20BAX356	Tourism Marketing	✓	✓	✓	✓	Become familiar with the marketing mix and be able to formulate the best mix for a particular travel.
Master of Business Administration	20BAX357	Event Management	✓	✓	✓	✓	Acquire skills regarding preparation of budget, apply and evaluate the proposal.
Master of Business Administration	20BAX358	Travel Agency and Tour Operation	✓	✓	✓	✓	Visualize the growth and prospects of travel agency and tour operator trade.
Master of Business Administration	20BAX359	Hospitality Management	✓	✓	✓	✓	Enhanced skills and industry exposure to the operations in front office of the hospitality industry.
Master of Business Administration	20BAX360	Hospital Operations Management	✓	✓	✓	✓	Understand the various facility management requirements in hospitals.

Master of Business Administration	20BAX361	Hospital Architecture Planning, Design & Maintenance	✓	✓	✓	✓	Understand the various processes in Project Management and formulation of projects.
Master of Business Administration	20BAX362	International Health Management	✓	✓	✓	✓	Comprehend the reforms in the health care sector with an international perspective.
Master of Business Administration	20BAX363	Public Health Systems and HealthInsurance	✓	✓	✓	✓	Understand the actuarial principles in Health Insurance system and the risk coverage.
Master of Business Administration	20BAX364	Health Care Laws and Ethics	✓	✓	✓	✓	Comprehend the various legal frame work for hospitals and the laws relating to consumer protection act.
Master of Business Administration	20BAX365	Hospital front office Management	✓	✓	✓	✓	Understand and be aware of basic outpatient services and inpatient services patient satisfaction.
Master of Business Administration	20BAX366	Entrepreneurship development	✓	✓	✓	✓	Visualize the different aspects of Entrepreneurship, and its role in Business and society.
Master of Business Administration	20BAX367	Innovation Management	✓	✓	✓	✓	Identify, evaluate and suggests solutions to challenges in large and small organizations relating to innovative performance.
Master of Business Administration	20BAX368	Social Entrepreneurship	✓	✓	✓	✓	Comprehend the financial issues for an entrepreneur in general and social entrepreneur.

Master of Business Administration	20BAX369	Small Business Management	✓	✓	✓	✓	Understand the institutional support to the development of small business and be prepared for interacting.
Master of Business Administration	20BAX370	Science and Technology Entrepreneurship	✓	✓	✓	✓	Comprehend the role of entrepreneurship in Science and Technology.
Master of Business Administration	20BAX371	Fertilizer Technology Management		✓	✓		Visualize the different manure and fertilizers used in different crops according to soil.
Master of Business Administration	20BAX372	Management Of Agro Chemicals		✓	✓		Gain appreciable knowledge about the agro-chemical industries.
Master of Business Administration	20BAX373	Management Of Floriculture And Landscaping	✓	✓	✓	✓	Gain appreciable knowledge on Landscape gardening.
Master of Business Administration	20BAX374	Farm Power and Machinery Management	✓	✓	✓	✓	Understand various sources of farm power and farm mechanization.
Master of Business Administration	20BAX375	Feed Business Management	✓	✓	✓	✓	Comprehend the basic knowledge on processing of feeds.
Master of Business Administration	20BAX376	Poultry And Hatchery Management	✓	✓	✓	✓	Visualize the basics in establishing a poultry and hatchery unit.

Master of Business Administration	20BAX377	Food Technology and Processing Management	✓	✓	✓	✓	Visualize the basics on food processing and food preservation.
Master of Business Administration	20BAX378	Fruit Production and Post-Harvest Management	✓	✓	✓	✓	Able to identify different functional fruits and development of drinks from them.
Master of Business Administration	20LSX401	Entrepreneurship and Innovation	✓	✓	✓	✓	Develop a business model for a new venture, including revenue. Margins, operations, working capital, and investment.
Master of Business Administration	20LSX402	Leadership and Management Skills	✓	✓	✓	✓	Understand and develop the skills consciously.
Master of Business Administration	20LSX403	Indian Ethos and Human Values		✓	✓		Apply values in day-to-day functioning for better standard of life.

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Criterion I
Curricular Aspects