



DEPARTMENT OF ELECTRICAL AND  
ELECTRONICS ENGINEERING

ACADEMIC YEAR 2022-2023

COURSE OUTCOMES

ACADEMIC YEAR 2022-2023

SEMESTER 1

Course Code: MAT 101

Course Name: LINEAR ALGEBRA AND CALCULUS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	It is introducing students to some basic mathematical ideas and tools which are at the core of any engineering course. A brief course in Linear Algebra familiarises students with some basic techniques in matrix theory which are essential for analysing linear systems.	solve systems of linear equations, diagonalize matrices and characterise quadratic forms
2	The calculus of functions of one or more variables taught in this course are useful in modelling and analysing physical phenomena involving continuous change of variables or parameters and have applications across all branches of engineering.	compute the partial and total derivatives and maxima and minima of multivariable functions
3		compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas
4		perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
5		determine the Taylor and Fourier series expansion of functions and learn their applications

Course Code: CYT 100

Course Name: ENGINEERING CHEMISTRY

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	the students to acquire knowledge in the concepts of chemistry for engineering applications and to familiarize the students with different application-oriented topics like spectroscopy, electrochemistry, instrumental methods etc.	Apply their knowledge for protection of different metals from corrosion. To prevent the monuments from getting corroded, recent trends in electrochemical energy storage devices.
2	Also familiarize the students with topics like mechanism of corrosion, corrosion prevention methods, SEM, stereochemistry, polymers, desalination etc., which enable them to develop abilities and skills that are relevant to the study and practice of chemistry.	Learn how to use different spectroscopy techniques for analysis purpose of simple molecules.
3		Design economically and new methods of synthesis nano materials.
4		Substitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution.
5		Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.

Course Code: EST 110

Course Name: ENGINEERING GRAPHICS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The student to effectively perform technical communication through graphical representation as per global standards.	Draw the projection of points and lines located in different quadrants
2		Prepare multi-view orthographic projections of objects by visualizing them in different positions
3		Draw sectional views and develop surfaces of a given object
4		Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
5		Convert 3D views to orthographic views, Obtain multiview projections and solid models of objects using CAD tools

Course Code: EST 120

Course Name: BASICS OF CIVIL & MECHANICAL ENGINEERING

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course is to provide an insight and inculcate the essentials of Civil Engineering discipline to the students of all branches of Engineering and to provide the students an illustration of the significance of the Civil Engineering Profession in satisfying the societal needs.	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.
2		Explain different types of buildings, building components, building materials and building construction
3		Describe the importance, objectives and principles of surveying.
4		Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
5		Discuss the Materials, energy systems, water management and environment for green buildings.
6		Analyse thermodynamic cycles and calculate its efficiency
7		Illustrate the working and features of IC Engines
8		Explain the basic principles of Refrigeration and Air Conditioning
9		Describe the working of hydraulic machines
10		Explain the working of power transmission elements
11		Describe the basic manufacturing, metal joining and machining processes

Course Code: HUN 101

Course Name: LIFE SKILLS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes.	Define and Identify different life skills required in personal and professional life
2	Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at.	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress..
3	This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underly personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers	Explain the basic mechanics of effective communication and demonstrate these through presentations.
4		Explain the basic mechanics of effective communication and demonstrate these through presentations.
5		Understand the basics of teamwork and leadership

Course Code: CYL 120

Course Name: ENGINEERING CHEMISTRY LAB

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To impart scientific approach and to familiarize with the experiments in chemistry relevant for research projects in higher semesters	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
2		Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
3		Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
4		Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
5		Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments. Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economic and environmental problems and why it is an integral part of curriculum

Course Code: ESL:120

Course Name: CIVIL & MECHANICAL WORKSHOP

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The course is designed to train the students to identify and manage the tools, materials and methods required to execute an engineering project.	Name different devices and tools used for civil engineering measurements
2	Students will be introduced to a team working environment where they develop the necessary skills for planning, preparing and executing an engineering project.	Explain the use of various tools and devices for various field measurements
3	To enable the student to familiarize various tools, measuring devices, practices and different methods of manufacturing processes employed in industry for fabricating components	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work.
4		Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
5		Compare different techniques and devices used in civil engineering measurements
6		Identify Basic Mechanical workshop operations in accordance with the material and objects
7		Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
8		Apply appropriate safety measures with respect to the mechanical workshop trades



ACADEMIC YEAR 2022-2023  
SEMESTER 2

Course Code: MAT 102

Course Name: VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
	It is introducing the concepts and applications of differentiation and integration of vector valued functions, differential equations, Laplace and Fourier Transforms	Compute the derivatives and line integrals of vector functions and learn their applications
	The objective of this course is to familiarize the prospective engineers with some advanced concepts and methods in Mathematics which include the Calculus of vector valued functions, ordinary differential equations and basic transforms such as Laplace and Fourier Transforms which are invaluable for any engineer's mathematical tool box.	Evaluate surface and volume integrals and learn their inter-relations and applications
	The topics treated in this course have applications in all branches of engineering	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients
		Compute Laplace transform and apply them to solve ODEs arising in engineering
		Determine the Fourier transforms of functions and apply them to solve problems arising in engineering

Course Code: PHT 100

Course Name: ENGINEERING PHYSICS A (FOR CIRCUIT BRANCHES)

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	the Engineering Physics Program is to offer students a solid background in the fundamentals of Physics and to impart that knowledge in engineering disciplines.	Compute the quantitative aspects of waves and oscillations in engineering systems
2	The program is designed to develop scientific attitudes and enable the students to correlate the concepts of Physics with the core programmes	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments
3		Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
4		Classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems
5		Analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system

Course Code: EST 100

Course Name: ENGINEERING MECHANICS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	the students to the fundamental concepts of mechanics and enhance their problem solving skills	Recall principles and theorems related to rigid body mechanics
2	It introduces students to the influence of applied force system and the geometrical properties of the rigid bodies while stationary or in motion.	Identify and describe the components of system of forces acting on the rigid body
3	After this course students will be able to recognize similar problems in real-world situations and respond accordingly.	Apply the conditions of equilibrium to various practical problems involving different force system
4		Choose appropriate theorems, principles or formulae to solve problems of mechanics
5		Solve problems involving rigid bodies, applying the properties of distributed areas and masses

Course Code: HUN 102

Course Name: PROFESSIONAL COMMUNICATION

SI No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	Clear, precise, and effective communication has become a sine qua non in today's information-driven world given its interdependencies and seamless connectivity.	. Understand the role of communication in personal & professional success
2	Any aspiring professional cannot but master the key elements of such communication.	. Understand the role of communication in personal & professional success
3	The objective of this course is to equip students with the necessary skills to listen, read, write, and speak so as to comprehend and successfully convey any idea, technical or otherwise, as well as give them the necessary polish to become persuasive communicators	Prepare and present messages with a specific intent.
4		Analyze a variety of communication acts.
5		Ethically use, document and integrate sources

Course Code: EST 102

Course Name: PROGRAMING IN C

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	C programs to solve computational problems that they may have to solve in their professional life.	Analyze a computational problem and develop an algorithm/flowchart to find its solution
2	The course content is decided to cover the essential programming fundamentals which can be taught within the given slots in the curriculum.	Write readable C programs with arrays, structure or union for storing the the data to be processed
3	This course has got 2 Hours per week for practicing programming in C. A list showing 24 mandatory programming problems are given at the end.	Write readable C programs with arrays, structure or union for storing the the data to be processed
4	The instructor is supposed to give homework/assignments to write the listed programs in the rough record as and when the required theory part is covered in the class. The students are expected to come prepared with the required program written in the rough record for the lab classes.	Write readable C programs which use pointers for array processing and parameter passing
5		Develop readable C programs with files for reading input and storing output

Course Code: PHL :120

Course Name: ENGINEERING PHYSICS LAB

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	the students gain practical knowledge to co-relate with the theoretical studies and to develop practical applications of engineering materials and use the principle in the right way to implement the modern technology.	Compute the quantitative aspects of waves and oscillations in engineering systems
2		Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments
3		Apply the concept of polarization to understand the wave nature of light and the method of analyzing the light whether it is polarized or not. Explain types of superconductivity and their applications
4		Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices
5		Compute the quantitative aspects of waves and oscillations in engineering systems

Course Code: ESL 130

Course Name: ELECTRICAL & ELECTRONICS WORKSHOP

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	Electrical Workshop is intended to impart skills to plan and carry out simple electrical wiring.	Demonstrate safety measures against electric shocks
2	It is essential for the practicing engineers to identify the basic practices and safety measures in electrical wiring.	identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols
3		Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings.
4		Identify and test various electronic components. Assemble and test electronic circuits on boards
5		Draw circuit schematics with EDA tools a team with good interpersonal skills



ACADEMIC YEAR 2022-2023  
SEMESTER 3

Course Code: MAT201

Course Name: PARTIAL DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS

Sl. No.	Course Objectives	Learning Outcomes (Course Outcomes)
1.	To understand basic ideas of partial differential equations which are widely used in the modelling and analysis of a wide range of physical phenomena	Understand the concept and the solution of partial differential equation.
2.	To understand the practical importance of solving differential equations. understand the differences between initial value and boundary value problems (IVPs and BVPs)	Analyse and solve one dimensional wave equation and heat equation
3.	To understand the basic theory of functions of a complex variable, describe conformal mappings between various plane regions.	Understand complex functions, its continuity differentiability with the use of Cauchy Riemann equations.
4.	To study the techniques of complex variables and functions together with their derivatives and Contour integration .	Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula, understand the series expansion of analytic function
5.	To study complex power series, classification of singularities, calculus of residues and its applications in the evaluation of integrals, and other concepts and properties.	Understand the series expansion of complex function about a singularity and apply residue theorem to compute several kinds of real integrals.

Course Code: EET201

Course Name: CIRCUITS AND NETWORKS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course introduces circuit analysis techniques applied to dc and ac electric circuits. Analyses of electric circuits in steady state and dynamic conditions are discussed. Network analysis is introduced with network parameters and transfer functions. This course serves as the most important prerequisite of all many advanced courses in electrical engineering.	CO 1 Apply circuit theorems to simplify and solve complex DC and AC electric networks.
2		CO 2 Analyse dynamic DC and AC circuits and develop the complete response to excitations.
3		CO 3 Solve dynamic circuits by applying transformation to s-domain.
4		CO 4 Analyse three-phase networks in Y and $\Delta$ configurations.
5		CO 5 Solve series /parallel resonant circuits.
6		CO 6 Develop the representation of two-port networks using network parameters and analyse.

Course Code: EET203

Course Name: MEASUREMENTS AND INSTRUMENTATION

SI No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	<p>This course introduces principle of operation and construction of basic instruments for measurement of electrical quantities. Measurement of basic circuit parameters, magnetic quantities, and passive parameters by using bridge circuits, sensors and transducers will be discussed. Familiarization of modern digital measurement systems are also included.</p>	CO 1 Identify and analyse the factors affecting performance of measuring system
2		CO 2 Choose appropriate instruments for the measurement of voltage, current in ac and dc measurements
3		CO 3 Explain the operating principle of power and energy measurement
4		CO 4 Outline the principles of operation of Magnetic measurement systems
5		CO 5 Describe the operating principle of DC and AC bridges, transducers based systems.
		CO 6 Understand the operating principles of basic building blocks of digital systems, recording and display units

Course Code: EET205

Course Name: ANALOG ELECTRONICS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course aims to Fundamentals of Electronics and semiconductor devices	CO 1 Design biasing scheme for transistor circuits.
2		CO 2 Model BJT and FET amplifier circuits.
3		CO 3 Identify a power amplifier with appropriate specifications for electronic circuit applications.
4		CO 4 Describe the operation of oscillator circuits using BJT.
5		CO 5 Explain the basic concepts of Operational amplifier(OPAMP)
6		CO 6 Design and develop various OPAMP application circuits.

Course Code: EST 200

Course Name: DESIGN AND ENGINEERING

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The objective of this course is to give an introduction to the basic principles of engineering design, inform them about the steps involved in the design process process and Familiarize them with the basic tools and design techniques to be used	Explain the different concepts and principles involved in design engineering.
2	Students are expected to learn and apply design thinking during engineering training, which is very important and relevant today.	Apply design thinking while learning and practicing engineering.
3	Case studies from different practical contexts can help students understand that design is not only about functionality, but also about various life cycle issues with multiple factors such as customer, economy and reliability.	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.

Course Code: MCN 201

Course Name: SUSTAINABLE ENGINEERING

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To inculcate in students an awareness of environmental issues and the global initiatives towards attaining sustainability.	Understand the relevance and the concept of sustainability and the global initiatives in this direction
2	To realize the potential of technology in bringing in sustainable practices.	Explain the different types of environmental pollution problems and their sustainable solutions
3		Discuss the environmental regulations and standards
4		Outline the concepts related to conventional and non-conventional energy
5		Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles

Course Code: EEL201

Course Name: CIRCUITS AND  
MEASUREMENTS LAB

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This laboratory course is designed to train the students to familiarize and practice various measuring instruments and different transducers for measurement of physical parameters. Students will also be introduced to a team working environment where they develop the necessary skills for planning, preparing and implementing basic instrumentation systems.	CO 1 Analyse voltage current relations of RLC circuits
2		CO 2 Verify DC network theorems by setting up various electric circuits
3		CO 3 Measure power in a single and three phase circuits by various methods
4		CO 4 Calibrate various meters used in electrical systems
5		CO 5 Determine magnetic characteristics of different electrical devices
6		CO 6 Analyse the characteristics of various types of transducer systems
7		CO 7 Determine electrical parameters using various bridges
8		CO 8 Analyse the performance of various electronic devices for an instrumentation systems and, to develop the team management and documentation capabilities.



Course Code: EEL203

Course Name: ANALOG ELECTRONICS LAB

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To introduce students to the basic components and circuits used in analog electronics.	CO 1 Use the various electronic instruments and for conducting experiments.
2	To teach students how to design and build simple analog circuits.	CO 2 Design and develop various electronic circuits using diodes and Zener diodes.
3	To familiarize students with the use of electronic instruments and tools.	CO 3 Design and implement amplifier and oscillator circuits using BJT and JFET.
4	To develop students' troubleshooting and debugging skills.	CO 4 Design and implement basic circuits using IC (OPAMP and 555 timers).
5	To give students an understanding of the principles of analog circuit operation.	CO 5 Simulate electronic circuits using any circuit simulation software.
6		CO 6 Use PCB layout software for circuit design

ACADEMIC YEAR 2022-2023  
SEMESTER 4

Course Code: MAT 204

Course Name: PROBABILITY RANDOM PROCESS AND NUMERICAL METHODS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To introduce the modern theory of probability and its applications to modelling and analysis and processing of random processes and signals	Understand the concept, properties and important models of discrete random variables and using them analyses suitable random phenomena.
2	To understand some basic numerical methods for interpolation and integration and also for finding roots of equations and solutions of ODEs.	Understand the concept, properties and important models of continuous random variables and using them analyses suitable random phenomena.
3	To learn most of the important models of discrete and continuous probability distributions and widely used models of random process such as Poisson process	Analyse random processes using autocorrelation, power spectrum and Poisson process model as appropriate.
4		Compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques.
5		Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.

Course Code: EET202

Course Name: DC MACHINES AND TRANSFORMERS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The purpose of the course is to provide the fundamentals of DC generators, DC motors and transformers and giving emphasis to applications in engineering field.	CO 1 Acquire knowledge about constructional details of DC machines
2		CO 2 Describe the performance characteristics of DC generators
3		CO3 Describe the principle of operation of DC motors and select appropriate motor types for different applications
4		CO 4 Acquire knowledge in testing of DC machines to assess its performance
5		CO 5 Describe the constructional details and modes of operation of single phase and three phase transformers
6		CO6 Analyse the performance of transformers under various conditions

Course Code: EET204

Course Name: ELECTROMAGNETIC THEORY

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The purpose of the course is to familiarize the students with the fundamentals of electrostatics, magnetostatics, time-varying fields and electromagnetic waves	CO 1 Apply vector analysis and coordinate systems to solve static electric and magnetic field problems.
2		CO 2 Apply Gauss Law, Coulomb's law and Poisson's equation to determine electrostatic field parameters
3		CO 3 Determine magnetic fields from current distributions by applying Biot-Savart's law and Amperes Circuital law.
4		CO 4 Apply Maxwell Equations for the solution of time varying fields
5		

Course Code: EET206

Course Name: DIGITAL ELECTRONICS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To introduce students to the basic components and circuits used in analog electronics.	CO 1 Identify various number systems, binary codes and formulate digital functions using Boolean algebra.
2	To teach students how to design and build simple analog circuits.	CO 2 Design and implement combinational logic circuits.
3	To familiarize students with the use of electronic instruments and tools.	CO 3 Design and implement sequential logic circuits.
4	To develop students' troubleshooting and debugging skills.	CO 4 Compare the operation of various analog to digital and digital to analog conversion circuits.
5	To give students an understanding of the principles of analog circuit operation.	CO 5 Explain the basic concepts of programmable logic devices and VHDL.

Course Code: HUT 200

Course Name: PROFESSIONAL ETHICS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes	
1	To enable students to create awareness on ethics and human values.	CO 1	Understand the core values that shape the ethical behavior of a professional
2		CO 2	Adopt a good character and follow an ethical life.
3		CO 3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics
4		CO 4	Solve moral and ethical problems through exploration and assessment by established experiments
5		CO 5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.

Course Code: MCN202

Course Name: CONSTITUTION OF INDIA

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes	
1	To understand their own country's constitution and study the importance of environment as well as understand their own human rights and to help the students to concentrate on their day-to-day discipline.	MCN202.1	Explain the background of the present constitution of India and features.
2	It also gives the knowledge and strength to face the society and people.	MCN202.2	Utilize the fundamental rights and duties.
3		MCN202.3	Understand the working of the union executive, parliament and judiciary.
4		MCN202.4	Explain the background of the present constitution of India and features.
5		MCN202.5	Utilize the fundamental rights and duties.



Course Code: EEL202

Course Name: ELECTRICAL MACHINES

LAB I

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The purpose of this lab is to provide practical experience in operation and testing of DC machines and transformers.	CO 1 Analyse the performance of DC motors and DC generators by performing load test.
2		CO 2 Sketch the Open Circuit Characteristics of a self excited DC shunt generator and check conditions of voltage build up by performing suitable experiment.
3		CO 3 Develop equivalent circuit and predetermine their regulation and efficiency by performing OC & SC tests on transformer.
4		CO 4 Analyse the efficiency and regulation of the transformer by performing load test.
5		CO 5 Analyse the efficiency of a DC machine when working as motor and generator by conducting suitable test.
6		CO 6 Examine the efficiency by performing Sumpner's test on two similar transformers.

Course Code: EEL204

Course Name: DIGITAL ELECTRONICS  
LAB

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To introduce students to the basic components and circuits used in analog electronics.	CO 1 Formulate digital functions using Boolean Algebra and verify experimentally.
2	To teach students how to design and build simple analog circuits.	CO 2 Design and implement combinational logic circuits.
3	To familiarize students with the use of electronic instruments and tools.	CO 3 Design and implement sequential logic circuits.
	To develop students' troubleshooting and debugging skills.	CO 4 Design and fabricate a digital circuit using the knowledge acquired from the laboratory.
	To give students an understanding of the principles of analog circuit operation.	

ACADEMIC YEAR 2022-2023  
SEMESTER 5

Course Code: EET301

Course Name: POWER SYSTEMS I

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
1	The basic objective of this course is to deliver fundamental concepts in power system components. The basic principle of generation, transmission and distribution of electrical power is comprehensively covered in this course ranging extensively from the conventional ones to the modern discoveries. Deregulated systems in the smart grid and micro-grid with details of grid connected energy storages are also introduced to the students through this course.	CO 1 Identify the power generating system appropriate for a given area.
2		CO 2 Evaluate the electrical performance of any transmission line.
3		CO 3 Compute various physical characteristics of underground and overhead transmission systems.
4		CO 4 Select appropriate switchgear for protection schemes.
5		CO 5 Design a simple electrical distribution system as per the standards.

Course Code: EET303

Course Name: MICROPROCESSORS AND  
MICROCONTROLLERS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course helps the students to understand 8085 microprocessor and 8051 microcontroller architecture as well as to design hardware interfacing circuit. This also aids to thrive their programming skills to solve real world problems.	Describe the architecture and timing diagram of 8085 microprocessor.
2		Develop assembly language programs in 8085 microprocessor.
3		Identify the different ways of interfacing memory and I/O with 8085 microprocessor.
4		Understand the architecture of 8051 microcontroller and embedded systems.
5		Develop assembly level and embedded C programs in 8051 microcontroller.

Course Code: EET305

Course Name: SIGNALS AND SYSTEMS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course introduces the concept of signals and systems. The time domain and frequency domain representation, operations and analysis of both the continuous time and discrete time systems are discussed. The application of Fourier analysis, Laplace Transform and Z- Transforms are included. Stability analysis of continuous time systems and discrete time systems are also introduced.	Explain the basic operations on signals and systems.
2		Apply Fourier Series and Fourier Transform concepts for continuous time signals.
3		Analyse the continuous time systems with Laplace Transform.
4		Analyse the discrete time system using Z Transform.
5		Apply Fourier Series and Fourier Transform concepts for Discrete time domain.
6		Describe the concept of stability of continuous time systems and sampled data systems.

Course Code: EET307

Course Name: SYNCHRONOUS AND INDUCTION MACHINES

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course aims to develop the skills for SYNCHRONOUS AND INDUCTION MACHINES	Analyse the performance of different types of alternators.
2		Analyse the performance of a synchronous motor.
3		Analyse the performance of different types of induction motors.
4		Describe operating principle of induction machine as generator.
5		Explain the types of single phase induction motors and their working principle.

Course Code: HUT300

Course Name: INDUSTRIAL ECONOMICS AND FOREIGN TRADE

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To equip the students to take industrial decisions and to create awareness of economic environment.	To equip the students to take industrial decisions and to create awareness of economic environment.
2		To equip the students to take industrial decisions and to create awareness of economic environment.
3		To equip the students to take industrial decisions and to create awareness of economic environment.
4		To equip the students to take industrial decisions and to create awareness of economic environment.
5		To equip the students to take industrial decisions and to create awareness of economic environment.



Course Code: MCN 301

Course Name: DISASTER MANAGEMENT

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To introduce the fundameand concepts of hazards disa management.	Define and use various terminologies in use in disaster management parlance and organise each of these terms in relation to the disaster management cycle (Cognitive knowledge level: Understand).
2		Distinguish between different hazard types and vulnerability types and do vulnerability assessment (Cognitive knowledge level: Understand).
3		Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk (Cognitive knowledge level: Understand).
4		Explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community (Cognitive knowledge level: Apply)
5		Identify factors that determine the nature of disaster response and discuss the various disaster response actions (Cognitive knowledge level: Understand).
6		Explain the various legislations and best practices for disaster management and risk reduction at national and international level (Cognitive knowledge level: Understand).

Course Code: EEL331

Course Name: MICROPROCESSORS AND MICROCONTROLLERS LAB

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This laboratory course is designed to train the students to familiarize and program microprocessors and microcontrollers. Students will also be introduced to a team working environment where they develop the necessary skills for planning, preparing and implementing embedded systems.	Develop and execute assembly language programs for solving arithmetic and logical problems using microprocessor/microcontroller.
2		Design and Implement systems with interfacing circuits for various applications.
3		Execute projects as a team using microprocessor/microcontroller for real life applications.

Course Code: EEL333

Course Name: ELECTRICAL MACHINES LAB II

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The purpose of this lab is to provide practical experience in the operation and testing of synchronous and induction machines	Analyse the performance of single phase and three phase induction motors by conducting suitable tests.
2		Analyse the performance of three phase synchronous machine from V and inverted V curves.
3		Analyse the performance of a three phase alternator by conducting suitable tests.

ACADEMIC YEAR 2022-2023  
SEMESTER 6

Course Code: EET302

Course Name: LINEAR CONTROL SYSTEMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
1	This course aims to provide a strong foundation on classical control theory. Modelling, time domain analysis, frequency domain analysis and stability analysis of linear systems based on transfer function approach will be discussed. The compensator design of linear systems is also introduced.	Describe the role of various control blocks and components in feedback systems.
2		Analyse the time domain responses of the linear systems.
3		Apply Root locus technique to assess the performance of linear systems.
4		Analyse the stability of the given LTI systems.
5		Analyse the frequency domain response of the given LTI systems.
6		Design compensators using time domain and frequency domain techniques.

Course Code: EET306

Course Name: POWER ELECTRONICS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To impart knowledge about the power semiconductor devices, the operation of various power converters and its applications	Explain the operation of modern power semiconductor devices and its characteristics.
2		Analyse the working of controlled rectifiers.
3		Explain the working of AC voltage controllers, inverters and PWM techniques.
4		Compare the performance of different dc-dc converters.
5		Describe basic drive schemes for ac and dc motors

Course Code: EET304

Course Name: POWER SYSTEMS II

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The basic objective of this course is to deliver fundamental concepts in power system analysis. The steady state and transient analysis of electrical power system is comprehensively covered in this course ranging extensively using the conventional methods as well as advanced mathematics.	Apply the per unit scheme for any power system network and compute the fault levels.
2		Analyse the voltage profile of any given power system network using iterative methods.
3		Analyse the steady state and transient stability of power system networks.
4		Model the control scheme of power systems.
5		Schedule optimal generation scheme

Course Code: EET322

Course Name: RENEWABLE ENERGY SYSTEMS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course introduces about different new and renewable sources of energy. Design of some of the systems are also discussed	Describe the environmental aspects of renewable energy resources.
2		Explain the operation of various renewable energy systems.
3		Design solar PV systems.
4		Explain different emerging energy conversion technologies and storage.



Course Code: HUT310

Course Name: Management for Engineers

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course is intended to help the students to learn the basic concepts and functions of management and its role in the performance of an organization and to understand various decisionmaking approaches available for managers to achieve excellence. Learners shall have a broad view of different functional areas of management like operations, human resource, finance and marketing.	CO1 Explain the characteristics of management in the contemporary context (Cognitive Knowledge level: Understand).
2		CO2 Describe the functions of management (Cognitive Knowledge level: Understand).
3		CO3 Demonstrate ability in decision making process and productivity analysis (Cognitive Knowledge level: Understand).
4		CO4 Illustrate project management technique and develop a project schedule (Cognitive Knowledge level: Apply).
5		CO5 Summarize the functional areas of management (Cognitive Knowledge level: Understand).
6		CO6: Comprehend the concept of entrepreneurship and create business plans (Cognitive Knowledge level: Understand).

Course Code: EET308

Course Name: COMPREHENSIVE COURSE WORK

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
1	The objective of this Course work is to ensure the comprehensive knowledge of each student in the most fundamental Program core courses in the curriculum. Five core courses credited from Semesters 3, 4 and 5 are chosen for the detailed study in this course work. This course has an End Semester Objective Test conducted by the University for 50 marks. One hour is assigned per week for this course for conducting mock tests of objective nature in all the listed five courses.	Apply the knowledge of circuit theorems to solve the problems in electrical networks
2		Evaluate the performance of DC machines and Transformers under different loading conditions
3		Identify appropriate digital components to realise any combinational or sequential logic.
4		Apply the knowledge of Power generation, transmission and distribution to select appropriate components for power system operation.
5		Apply appropriate mathematical concepts to analyse continuous time and discrete time signals and systems

Course Code: EEL332

Course Name: POWER SYSTEMS LAB

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This Laboratory Course will provide a perfect platform for the students to do hands-on practise with hardware and software in Power Systems. The experiments include simulation of power system analysis in steady state and transient state. The Hardware experiments cover Protective Relaying and High Voltage Testing. Successful completion of this lab will certainly make the students equipped for any Power Industry.	Develop mathematical models and conduct steady state and transient analysis of power system networks using standard software.
2		Develop a frequency domain model of power system networks and conduct the stability analysis.
3		Conduct appropriate tests for any power system component as per standards.
4		Conduct site inspection and evaluate performance ratio of solar power plant.

Course Code: EEL334

Course Name: POWER

ELECTRONICS LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
1	Impart practical knowledge for the design and setup of different power electronic converters and its application for motor control.	Determine the characteristics of SCR and design triggering circuits for SCR based circuits.
2		Design, set up and analyse single phase AC voltage controllers.
3		Design, set up and test suitable gate drives for MOSFET/IGBT.
4		Design, set up and test basic inverter topologies.
5		Design and set up dc-dc converters.
6		Develop simulation models of dc-dc converters, rectifiers and inverters using modern simulation tools.

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SEMESTER 7

Course Code: EET401

Course Name: ADVANCED CONTROL SYSTEMS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course aims to provide a strong foundation on advanced control methods for modelling, time domain analysis, and stability analysis of linear and nonlinear systems. The course also includes the design of feedback controllers and observers.	CO 1 Develop the state variable representation of physical systems
2		CO 2 Analyse the performance of linear and nonlinear systems using state variable approach
3		CO 3 Design state feedback controller for a given system
4		CO 4 Explain the characteristics of nonlinear systems
5		CO 5 Apply the tools like describing function approach or phase plane approach for assessing the performance of nonlinear systems
6		CO 6 Apply Lyapunov method for the stability analysis of physical systems.

Course Code: EET413

Course Name: ELECTRIC DRIVES

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To impart knowledge about the DC and AC motor drives and its applications	CO 1 Describe the transient and steady state aspects electric drives
2		CO 2 Apply the appropriate configuration of controlled rectifiers for the speed control of DC motors
3		CO 3 Analyse the operation of chopper-fed DC motor drive in various quadrants
4		CO 4 Illustrate the various speed control techniques of induction motors
5		CO 5 Examine the vector control of induction motor drives
6		CO 6 Distinguish different speed control methods of synchronous motor drives

Course Code: CET415

Course Name: ENVIRONMENTAL IMPACT ASSESSMENT

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course introduces the methodologies for identifying, predicting, evaluating and mitigating the impacts on environment due to any developmental project or activities.	Explain the need for minimizing the environmental impacts of developmental activities
2	Students will learn how to prepare an impact assessment report and devise an environment management plan.	Outline environmental legislation & clearance procedure in the country
3	Sufficient background will be provided on the environmental clearance procedures in India.	Apply various methodologies for assessing the environmental impacts of any developmental activity
4		Prepare an environmental impact assessment report
5		Conduct an environmental audit



Course Code: MCN 401

Course Name: INDUSTRIAL SAFETY ENGINEERING

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To give knowledge of various safety management principles, various safety systems, various machine guarding devices, hazard identification techniques, energy sources, systems & applications and the need in the present context.	"Describe the theories of accident causation and preventive measures of industrial accidents"
2	To compare different hazard identification tools and choose the most appropriate based on the nature of the industry.	Explain about personal protective equipment, its selection, safety performance & indicators and importance of housekeeping
3	It aims to equip students in working with projects and to take up research work in connected areas	Explain different issues in construction industries.
4		Describe various hazards associated with different machines and mechanical material handling.
5		Utilise different hazard identification tools in different industries with the knowledge of different types of chemical hazards.

Course Code: EEL411

Course Name: CONTROL SYSTEMS LAB

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This Laboratory Course provides a platform for modelling and analysis of linear and nonlinear systems with the help of hardware and software tools in the control framework.	CO 1 Demonstrate the knowledge of simulation tools for control system design.
2		CO 2 Develop the mathematical model of a given physical system by conducting appropriate experiments.
3		CO 3 Analyse the performance and stability of physical systems using classical and advanced control approaches.
4		CO 4 Design controllers for physical systems to meet the desired specifications.

Course Code: EEQ413

Course Name: SEMINAR

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To do literature survey in a selected area of study.	Identify academic documents from the literature which are related to her/his areas of interest (Cognitive knowledge level: Apply)
2	To understand an academic document from the literature and to give a presentation about it.	Read and apprehend an academic document from the literature which is related to her/ his areas of interest (Cognitive knowledge level: Analyze).
3	To prepare a technical report.	Apply Prepare a presentation about an academic document (Cognitive knowledge level: Create).
4		Give a presentation about an academic document (Cognitive knowledge level: Apply).
5		Prepare a technical report (Cognitive knowledge level: Create).

Course Code: EED415

Course Name: PROJECT PHASE I

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To apply engineering knowledge in practical problem solving.	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).
2	To foster innovation in design of products, processes or systems.	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).
3	To develop creative thinking in finding viable solutions to engineering problems.	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).
4		Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).
5		Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).
6		Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).

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SEMESTER 8

Course Code: EET402

Course Name: ELECTRICAL SYSTEM DESIGN AND ESTIMATION

SI No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	Electrical System Design would provide general awareness on IS Product standards / Codes of Practice, The Electricity Act 2003, CEA Regulations and Rules, NEC etc. related to Domestic, Industrial and Commercial Installations. It will also help in the design of Main and	CO 1 Explain the rules and regulations in the design of components for medium and high voltage installations.
2	Sub Switchboards and distribution system for a medium class domestic and industrial electrical	CO 2 Design lighting schemes for indoor and outdoor applications.
3	installations. Design of lighting system and selection of luminaries. Selection of Underground cables, Standby generators, lifts and with all involved auxiliaries. Design and selection of power	CO 3 Design low/medium voltage domestic and industrial electrical installations.
4	distribution system with power and motor loads for a medium industry.	CO 4 Design, testing and commissioning of 11 kV transformer substation.
5	Electrical system design for High-rise buildings with rising main/ cable distribution to upper floors including fire pumps. Design of indoor and outdoor 11kV substations including selection of switching and protective devices for an HT consumer. Essential safety requirements for the electrical installations for Recreational buildings	CO 5 Design electrical installations in high rise buildings.

Course Code: EET424

Course Name: ENERGY MANAGEMENT

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course introduces basic knowledge about energy management and audit. Energy management opportunities in electrical and mechanical systems are discussed. Demand side management and ancillary services are explained. Economic analysis of energy conservation measures are also described.	CO 1 Analyse the significance of energy management and auditing.
2		CO 2 Discuss the energy efficiency and management of electrical loads.
3		CO 3 Apply demand side management techniques.
4		CO 4 Explain the energy management opportunities in industries.
5		CO 5 Compute the economic feasibility of the energy conservation measures.

Course Code: EET436

Course Name: POWER QUALITY

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The objective of this course is to introduce the fundamental concepts of power quality. This course covers different power quality issues and its mitigation methods.	CO 1 Identify the sources and effects of power quality problems.
2		CO 2 Apply Fourier concepts for harmonic analysis.
3		CO 3 Explain the important aspects of power quality monitoring.
4		CO 4 Examine power quality mitigation techniques.
5		CO 5 Discuss power quality issues in grid connected renewable energy systems.



Course Code: EET468

Course Name INDUSTRIAL INSTRUMENTATION AND AUTOMATION

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	This course introduces basic terms and techniques applicable to instrumentation and various automation activities related to the industry and power sector. It also provides a basic idea of the recent developments in communication techniques and process control in industrial automation.	CO 1 Identify the sensors/transducers suitable for industrial applications.
2		CO 2 Design the signal conditioning circuits for industrial instrumentation and automation.
3		CO 3 Analyze the concepts of data transmission and virtual instrumentation related to automation
4		CO 4 Develop the logic for the process control applications using PLC programming
5		CO 5 Describe the fundamental concepts of DCS and SCADA systems

Course Code: EET404

Course Name: COMPREHENSIVE VIVA VOCE

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	The objective of this Course viva is to ensure the basic knowledge of each student in the most fundamental core courses in the curriculum. The viva voce shall be conducted based on the core subjects studied from third to eighth semester. This course helps the learner to become competent in placement tests and other competitive examinations.	Apply the knowledge of circuit theorems to solve the problems in electrical networks
2		Evaluate the performance of DC machines and Transformers under different loading conditions
3		Identify appropriate digital components to realise any combinational or sequential logic.
4		Apply the knowledge of Power generation, transmission and distribution to select appropriate components for power system operation.
5		Apply appropriate mathematical concepts to analyse continuous time and discrete time signals and systems

Course Code: EED416

Course Name: PROJECT PHASE II

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
1	To apply engineering knowledge in practical problem solving.	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).
2	To foster innovation in design of products, processes or systems.	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).
3	To develop creative thinking in finding viable solutions to engineering problems.	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).
4		Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).
5		Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).
6		Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).