Third Year Electrical Engineering
(2019 course)

303141: Industrial and Technology Management						
Teaching Scheme			**Credits**		**Examination Scheme**	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
					ESE	70 Marks

Course Objectives: This course aims to

- Possess knowledge of types of business organizations.
- Explore the fundamentals of Industrial economics and Management.
- Understand the basic concepts of Technology management and Quality management.
- Analyze and differentiate between marketing management and financial management.
- Recognize the importance of Motivation, Group dynamics, Teamwork, leadership skill and entrepreneurship.
- Explain the fundamentals of Human Resource management.
- Identify the importance of Intellectual property rights and understand the concept of patents, copy rights and trademarks.
- Software programming to construct and use simple mathematical model.
- Ability to carry out basic manufacturing and testing procedure.

Course Outcomes: At the end of this course, student will be able to

CO1	Differentiate between different types of business organizations and discuss the fundamentals of economics and management.
CO2	Explain the importance of technology management and quality management.
CO3	Explain the importance of IPR and role of Human Resource Management.
CO4	Understand the importance of Quality and its significance.
CO5	Describe the characteristics of marketing & its types and overview of financial Management.
CO6	Discuss the qualities of a good leader and road map to Entrepreneurship.

303142: Power Electronics

Teaching Scheme			Credits		Examination Scheme	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
Practical	04	Hr/Week/batch	**PR**	02	**ESE**	70 Marks
					PR	50 Marks

Prerequisite:

1. Knowledge of semiconductor material, basic electronics, diode, BJT, UJT, FET and its characteristics.
2. Working of Diode based rectifier, concept of RMS and average value
3. Use square notebooks for notes and plotting of waveforms.

Course Outcomes: At the end of this course, student will be able to

CO1	Develop characteristics of different power electronic switching devices.
CO2	Reproduce working principle of power electronic converters for different types of loads.
CO3	Choose the appropriate converter for different applications.

303143: Electrical Machines-II

Teaching Scheme			Credits		Examination Scheme	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
Practical	02	Hr/Week/batch	**PR**	01	**ESE**	70 Marks
					PR	25 Marks
					TW	25 Marks

Prerequisite:

- Magnetic circuits, Force on current carrying conductor placed in magnetic field, Fleming Right Hand & Left Hand Rule.
- Working principle and construction DC Machines, transformer & 3-ph induction motor.
- Phasor diagram and equivalent circuit of single phase transformer.

Course Outcomes: At the end of this course, student will be able to

CO1	Learn construction, working principle of three phase Synchronous Machines, Induction Motors, A.C. Series Motor and Special Purpose Motors.
CO2	Understand characteristics of three phase Synchronous Machines, Induction Motors, A.C. Series Motor and Special Purpose Motors.
CO3	Select the above machines in Power System, industrial, household & Military Engineering applications.
CO4	Testing of machines to evaluate the performance through experimentation.

303144: Electrical Installation, Design and Condition Based Maintenance

Teaching Scheme			Credits		Examination Scheme	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
Practical	04	Hr/Week/batch	**PR**	02	**ESE**	70 Marks
					OR	25 Marks
					TW	25 Marks

Prerequisite:

Basic Electrical Engg, Power System 1, Electrical Machines I and Electrical Machines II.

Course Outcomes: At the end of this course, student will be able to

CO1	Classify different types of distribution supply system and determine economics of distribution system. compare and classify various substations, bus-bars and Earthing systems.
CO2	Demonstrate the importance and necessity of maintenance.
CO3	Analyse and test different condition monitoring methods.
CO4	Carry out estimation and costing of internal wiring for residential and commercial installations.
CO5	Apply electrical safety procedures.

303145A: Elective-I: Advanced Microcontroller and Embedded System

Teaching Scheme			Credits		Examination Scheme	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
					ESE	70 Marks

Prerequisite:

1. Knowledge of Number system and Basic logic components.
2. Programming basics of C language.
3. Advantage of Microcontroller over Microprocessor.

Course Outcomes: At the end of this course, student will be able to

CO1	Explain architecture of PIC 18F458 microcontroller, its instructions and the addressing modes.
CO2	Use Ports and timers for peripheral interfacing and delay generation.
CO3	Interface special and generate events using CCP module.
CO4	Effectively use interrupt structure in internal and External interrupt mode.
CO5	Effectively use ADC for parameter measurement and also understand LCD interfacing.
CO6	Use Serial Communication and various serial communication protocols.

303146: Seminar						
Teaching Scheme			**Credits**		**Examination Scheme**	
SEM	01	Hr/Week	**SEM**	01	**TW**	50 Marks
Course Outcomes: At the end of this course, student will be able to						
CO1	Relate with the current technologies and innovations in Electrical engineering.					
CO2	Improve presentation and documentation skill					
CO3	Apply theoretical knowledge to actual industrial applications and research activity.					
CO4	Communicate effectively.					

303148: Power System-II						
Teaching Scheme			**Credits**		**Examination Scheme**	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
Practical	02	Hr/Week/batch	**TU**	01	**ESE**	70 Marks
Tutorial	01	Hr/Week/batch	**PR**	01	**PR**	50 Marks
					TW	25 Marks
Note: TW marks: 15 for Tutorial and 10 for continuous assessment of lab work						
Prerequisite:						
Power Generation Technology, Power System-I, Electrical machine I and II						
Course Outcomes: At the end of this course, student will be able to						
CO1	Solve problems involving modelling, design and performance evaluation of HVDC and EHVAC power transmission lines.					
CO2	Calculate per unit values and develop Y bus for solution power flow equations in power transmission networks					
CO3	Calculate currents and voltages in a faulted power system under both symmetrical and asymmetrical faults, and relate fault currents to circuit breaker ratings.					

303149: Computer Aided Design of Electrical Machines						
Teaching Scheme			**Credits**		**Examination Scheme**	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
Practical	04	Hr/Week/batch	**TU**	00	**ESE**	70 Marks
Tutorial	00	Hr/Week/batch	**PR**	02	**OR**	25 Marks
					TW	50Marks

Prerequisite:

1. Knowledge of fundamentals of electrical engineering.
2. Knowledge of various materials used in electrical machines.
3. Knowledge of types, construction and working of transformer.
4. Knowledge of types, construction and working of three phase induction motor.

Course Outcomes: At the end of this course, student will be able to

CO1	Summarize temperature rise, methods of cooling of transformer and consider IS 2026 in transformer design.
CO2	Design the overall dimensions of the transformer.
CO3	Analyze the performance parameters of transformer.
CO4	Design overall dimensions of three phase Induction motor
CO5	Analyze the performance parameters of three phase Induction motor.
CO6	Implement and develop computer aided design of transformer and induction motor.

303150: Control System Engineering						
Teaching Scheme			**Credits**		**Examination Scheme**	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
Practical	02	Hr/Week/batch	**TU**	01	**ESE**	70 Marks
Tutorial	01	Hr/Week/batch	**PR**		**OR**	25 Marks
					TW	25 Marks

Prerequisite:

Laplace Transform, Ordinary differential equations.

Course Outcomes: At the end of this course, student will be able to

CO1	Construct mathematical model of Electrical and Mechanical system using differential equations and transfer function and develop analogy between Electrical and Mechanical systems.
CO2	Determine time response of systems for a given input and perform analysis of first and second order systems using time domain specifications.
CO3	Investigate closed loop stability of system in s-plane using Routh Hurwitz stability criteria and root locus.
CO4	Analyze the systems in frequency domain and investigate stability using Nyquist plot and Bode plot
CO5	Design PID controller for a given plant to meet desired time domain specifications.

303151D:Elective-II Energy Management						
Teaching Scheme			**Credits**		**Examination Scheme**	
Theory	03	Hr/Week	**TH**	03	**ISE**	30 Marks
					ESE	70 Marks
Prerequisite:						
Various electrical equipment and specifications, Construction and operation of different equipment/process like HVAC, Pumps, Compressors etc.						
Course Outcomes: At the end of this course, student will be able to						
CO1	Describe BEE Energy policies, Energy ACT.					
CO2	List and apply demand side management measures for managing utility systems.					
CO3	Explore and use simple data analytic tools.					
CO4	Use various energy measurement and audit instruments.					
CO5	Evaluate economic feasibility of energy conservation projects.					
CO6	Identify appropriate energy conservations methods for electric and thermal utilities.					

303152: Internship						
Teaching Scheme			**Credits**		**Examination Scheme**	
IN	04	Hr/Week	**IN**	04	**TW**	100 Marks
Preamble						
Internship is a short-term industrial working experience for the students. The internship aims at providing entry-level exposure to a particular industry. It is expected that students should spend time working on relevant projects or part of the project and acquire learning about the field, along with developing industry connections, and employability skills.						
Course Outcomes: At the end of this course, student will be able to						
CO1	Understand the working culture and environment of the Industry and get familiar with various departments and practices in the industry.					
CO2	Operate various meters, measuring instruments, tools used in industry efficiently and develop technical competence.					
CO3	Apply internship learning in other course completions and final year project management, i.e. topic finalization, project planning, hardware development, result interpretations, report writing, etc.					
CO4	Create a professional network and learn about ethical, safety measures, and legal practices.					
CO5	Appreciate the responsibility of a professional towards society and the environment.					
CO6	Identify career goals and personal aspirations.					