Course outcomes of EEE II -I sem

ELECTRICAL CIRCUIT ANALYSIS Course Code: GR18A2023

Course Outcomes:

· Apply network theorems for the analysis of electrical circuits.
· Explain the transient and steady-state response of electrical circuits.
· Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
· Interpret electrical circuits using Laplace and Inverse Laplace transform and Identify poles, zeros and draw the frequency response of a transfer function.
· Develop network by two port parameters.

ANALOG ELECTRONIC CIRCUITS Course Code: GR18A2024

Course Outcomes:

· Summarize the characteristics of transistors.
· Analyze various rectifier and amplifier circuits.
· Distinguish characteristics of BJT and MOSFET
· Design sinusoidal and non-sinusoidal oscillators.
· Develop Op-Amp based circuits**.**

ELECTRICAL MACHINES - I Course code: GR18A2025

Course Outcomes:

· Explain the differences between linear and non-linear magnetic circuits
· Summarize the concepts of generators and motors
· Select the appropriate DC generator or DC motor for the given application
· Test the given DC Generator or DC motor.
· List the different types of materials used in transformers.

ELECTROMAGNETIC FIELDS Course Code: GR18A2026

Course Outcomes:

· Solve the problems in different EM fields using Different Coordinates Systems.
· Evaluate the Electric Field Density and Intensity for Different Charges.
· Understand the Electromagnetic Relation using Maxwell Formulae.
· Apply Electro Static and Magnetic to Static circuits using Basic relations.
· Analyze circuits using Conductors in Time Varying Fields.

ANALOG ELECTRONIC CIRCUITS LAB Course Code: GR18A2028

Course Outcomes: -

· Select suitable devices based on circuit requirements.

. Design linear and nonlinear wave shaping circuits.

· Develop different types of multi vibrator circuits.

· Design oscillators and function generator circuits.

· Analyze design of summers, subtactors, integrator and differentiator circuits using op-amps.

ELECTRICAL MACHINES-I LAB Course Code: GR18A2029

Course Outcomes:

At the end of this course, students will be able to

- Identify the various parts of electrical DC machines and Transformers.
- Develop knowledge helpful for application of DC machines and Transformers
- Analyze the different DC Machines.
- Distinguish performance of different machines using different testing methods
- Determine the parameters of equivalent circuit of single phase transformer and performance

COURSE OUTCOMES OF II Year II Semester

PRINCIPLES of DIGITAL ELECTRONICS Course Code: GR18A2084

Course Outcomes:

At the end of this course, students will be able to

· Summarize the working of logic families and logic gates.

· Design Combinational logic circuits and Sequential logic circuits.

· Distinguish between Analog to Digital conversion and Digital to Analog conversion circuits and their applications

· Analyze the types of Flip-Flops used in designing the registers.

· Discuss the types of Memories and use of PLD's

ELECTRICAL MACHINES-II Course Code: GR18A2031

Course Outcomes:

· Understand the concepts of rotating magnetic fields.

· Importance of application of electrical Ac machines.

· Demonstrate working of single and three phase AC machines.

· Calculate Machine Variables in direct and quadrature axis form for salient pole type,

· Summarize the concept of harmonic created in supply system, need for reduction and design of synchronous machines for reducing them

CONTROL SYSTEMS **Course Code: GR18A2032**

Course Outcomes:

- Develop the modelling of linear time-invariant systems using transfer function and apply block diagram algebra.
- Explain the concept of time response, stability and its assessment for linear time-invariant systems.
- Compare the Bode and Nyquist plot to determine the stability of a system.
- Determine the dynamic model of a system using state space approach.
- Design of PI,PD controllers and lead ,lag compensators

DIGITAL ELECTRONICS LAB **Course Code: GR18A2033**

Course Outcomes:

- Explain working of logic families and logic gates.
- Implement and deisgn Combinational and Sequential logic circuits.
- Understand the process of Analog to Digital conversion and Digital to Analog conversion.
- Analyze the types of Flip-Flops used in designing the registers.
- Discuss the types of Memories and their advantages and application

ELECTRICAL MACHINES-II LAB **Course Code: GR18A2034**

Course Outcomes :

- Explain the concepts of rotating magnetic fields.
- Solve the parameters of equivalent circuit of single phase induction motor.
- Analyze performance characteristics of AC machines
- Apply the various characteristics of three phase induction motor.
- Design a synchronous machine to find direct and quadrature axis reactance

CONTROL SYSTEMS LAB **Course Code: GR18A2035**

Course Outcomes:

- Solve simple control system programs using simulation packages.
- Explain the characteristics of synchros.
- Compare the root locus and bode plots.
- Analyze the transfer function of DC motor/generator.

Design the lead and lag compensators and improve the performance of servomotor and PID controller

Course outcomes of EEE III -I sem

POWER SYSTEMS-I Course Code: GR18A3013

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Summarize the basic concepts of Power Generation.
2. Identify various power system components.
3. Classify the different concepts related to Power Transmission and Distribution Systems
4. Interpret about the generation of overvoltages and insulation coordination.
5. Elaborate basic protection schemes.

POWER ELECTRONICS Course Code: GR18A3014

Course Outcomes: -

Students will be able to:

1. Relate the differences between signal level and power level devices
2. Illustrate the principle of operation, characteristics of commonly employed power electronic switching devices
3. Elaborate the performance of controlled rectifier circuits
4. Interpret the operation of DC-DC choppers
5. Analyze the operation of voltage source inverters

MICROCONTROLLERS Course Code: GR18A3015

Course Outcomes: -

Students will be able to:

- Explain the internal architecture, organization and assembly language programming of 8051 processors.
- Recall the assembly language Programming.
- Design the interfacing of peripherals like Memory, I/O, A/D, D/A, timer etc.
- Develop the communication of 8051 with Bluetooth and Zig-bee devices.
- Experiment with various programs to run applications

SIGNALS AND SYSTEMS Course Code: GR18A2052

Course Outcomes:

At the end of the course, students will be able to

• Explain the fundamentals of mathematical models and analyze deterministic CT signals and systems

• Analyze the effect of LTI systems on signals passing through them in frequency and time domains

• Conclude the effect of sampling in continuous-time signals and apply sampling theorem in signal processing problems

• Analyze the Fourier, Laplace and Z-transforms as appropriate for various signals and systems

• Solve simple problems as applicable to the field of communication, signal processing and control

POWER SYSTEMS -I LAB **Course Code :GR18A3020**

Course Outcomes:

At the end of this course, students will able to

1. Distinguish the characteristics of different relays.
2. Identify various types of faults and its protection
3. Explain the protection scheme for over and under voltages
4. Evaluate the protection scheme for negative sequence components
5. Design and analyse the transmission line model

POWER ELECTRONICS LAB **Course Code: GR18A3021**

Course Outcomes: -

Students will be able to:

1. Choose appropriate switching devices & firing circuits based on their characteristics and application
2. Discuss the operation of power switching converters
3. Develop practical control circuits for various real time applications
4. Analyze the operation of Inverters & Cycloconverters
5. Judge power electronic converter performance for various applications in virtual platforms

MICROCONTROLLERS LAB **Course Code: GR18A3022**

Course Outcomes: -

Students will be able to:

- Recall the assembly level and embedded C programming using 8051.
- Compare the difference between Assembly language and Embedded C Programming
- Design circuits for interfacing different modules to microcontrollers.
- Experiment 8051 with different types of communicating devices.
- Evaluate various programs which can resemble to the real time applications

ARTIFICIAL INTELLIGENCE TECHNIQUES (Professional Elective –I)

Course Code: GR18A3016

Course outcome

At the end of this course, students will demonstrate the ability to

1. List the importance of designing the System with Artificial Neural Networks.

2. Classify different types of fuzzification and defuzzification methods.
3. Distinguish the various Neural Networks Architectures.
4. Identify a system using Fuzzy logic or Neural network
5. Analyze the parameters of Genetic Algorithm.

WIND AND SOLAR ENERGY SYSTEMS (Professional Elective –I)
Course Code : GR18A3017
Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Recall the energy scenario and the consequent growth of the power generation from renewable energy sources
2. Discuss the basic physics of solar power generation
3. Implement the power electronic interfaces for solar generation
4. Elaborate the basic physics of wind power generation
5. Utilize the power electronic interfaces for wind generation

ELECTRICAL MACHINE DESIGN (Professional Elective –I)
Course Code: GR18A3018
Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Explain the construction and performance characteristics of electrical machines.
2. Summarize various factors which influence the design electrical, magnetic and thermal.
3. understand the principles of electrical machine performance.
4. Design and carry out a basic design of an ac machine
5. Utilize software tools to do design calculations.

ELECTROMAGNETIC WAVES(Professional Elective –I)
Course Code: GR18A3019
Course Outcomes: -

Students will be able to:

1. Analyse transmission lines and estimate voltage and current at any point on transmission line for different load conditions.
2. Solve real life plane wave problems for various boundary conditions.
3. Analyse the field equations for the wave propagation in special cases such as loss and low loss dielectric media.
4. Construct TE patterns of field distributions in a rectangular wave-guide.
5. Construct TEM patterns of field distributions in a rectangular wave-guide

Course outcomes of EEE III -II sem

POWER SYSTEMS-II Course Code: GR18A3073 P

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Recall various Synchronous Machines.
2. Formulate the Impedance and admittance matrices
3. Solve Power Flow equations using different numerical methods
4. Evaluate fault currents for different types of faults
5. Analyze a power system in steady state and Stability Constraints in a grid

ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

Course Code: GR18A3074

Course Outcomes

At the end of this course, students will demonstrate the ability to

1. Summarize the measurement of different electrical quantities.
2. Solve unknown values in AC & DC Bridges.
3. Determine Oscilloscopes and evaluate the usage of Digital voltmeters.
4. Distinguish different types Transducers & Non-electrical quantities.
5. Design a system and analyze the techniques, skills for electrical projects to meet desired needs in electrical engineering

ELECTRICAL DRIVES Course Code: GR18A3075

Course Outcomes:

Upon completing this course students are able to

1. Analyse 1Φ & 3Φ converters fed DC motors and categorise the electric drive system based on the applications.
2. Understand the various mode of operations of electrical drives
3. Evaluate the performance characteristics of converter fed and chopper fed DC motor drives
4. Propose a speed control scheme of an induction motor drive for real life applications
5. Compare Separate control and self-control of synchronous motors drive.Course

POWER SYSTEMS -II LAB Course Code: GR18A3080

Course Outcomes:

At the end of this course, students will able to

1. Modelling of various parameters in power system
2. Analyse different load flow problems

3. Summarise different protection schemes for the faults
4. Evaluate short circuit analysis for a power system network
5.Construct the model to solve stability problems

MEASUREMENTS AND INSTRUMENTATION LAB
Course Code: GR18A3081
Course Outcomes:
At the end of this course, students will demonstrate the ability to
1. Solve and validate DC and AC bridges.
2. Analyze the dynamic response using instruments like DSO and Function Generator.
3. Estimate statistical data analysis for measurement.
4. Measure physical quantities like Voltage, Power, Energy & Position.
5. Construct basic programs for computer-controlled data acquisition, measurement and transfer of data across the sensor network for different types of sensors.

LINE-COMMUTATED AND ACTIVE PWM RECTIFIERS
(Professional Elective –II) Course Code: GR18A3076
Course Outcomes: -
Students will be able to:
1. Illustrate diode rectifiers with passive filters.
2. Summarize thyristor rectifiers with passive filters.
3. Distinguish various multi-pulse converters.
4. Elaborate AC-DC Single Switch & Bidirectional Boost Converters.
5. Analyze AC-DC flyback converters.

POWER SYSTEM PROTECTION (Professional Elective –II)
Course Code: GR18A3077
Course Objectives:
1. Illustrate the need for protective systems
2. Understand the functioning of circuit breakers
3. Choose proper relay schemes for protection
4. Understand the application of numerical relays
5. Apply WAMS for improving protection systems.

CONTROL SYSTEMS DESIGN (Professional Elective –II)
Course Code: GR18A3078
Course Outcomes: -
Students will be able to:
1.Understand various design specifications.
2. Design of lag, lead and lag-lead compensators in time domain.

3. Construct the various compensators in frequency domain.
4 Design controllers to satisfy the desired design specifications using simple controller structures (P, PI, PID, compensators).
5. Analyze the controllers using the state-space approach.

COMPUTATIONAL ELECTROMAGNETICS (Professional Elective –II)
Course Code: GR18A3079
Course Outcomes: students will demonstrate the ability to
1. Illustrate the basic concepts of electromagnetic.
2. List computational techniques for computing fields.
3. Understanding Finite Difference methods.
4. Understanding Finite Element methods.
5. Demonstrate the low frequency drives, Transformers and Machines.

EMBEDDED SYSTEMS(Open Elective-I)
Course Code: GR18A4102
COURSE OUTcomes:
After completing this course, the student will be able to,
1. Understand various I/O devices and their communication.
2. Define the unique design problems and challenges of real-time systems Program an embedded system
3. Identify the unique characteristics of real-time operating systems and evaluate the need for real-time operating system
4. Explain the general structure of a real-time system and how to use RTOS to build an embedded real-time system.
5. Gain knowledge and skills necessary to design and develop embedded applications based on real-time operating systems.

Course outcomes of EEE IV -I sem

POWER SYSTEMS-III Course Code: GR18A4012

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1.List methods to control the voltage, frequency and power flow.

2. Summaries about Reactive Power compensation

3.Compose monitoring and control of a power system.

4. Explain the basics of power system economics.

5.Discuss about Demand Side-management

ELECTRONICS DESIGN Course Code: GR18A4013

Course Outcomes: -

At the end of this course, Students will be able to:

1. Illustrate the construction and working of different measuring instruments
2. Identify the application of measuring instruments
3. Examining the construction and working of signal conditioning system
4. Determine the use of electronic instruments
5. Formulate the architecture Microcontrollers

ELECTRONICS DESIGN LABORATORY Course Code: GR18A4022

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. List the practical issues related to practical implementation of applications using electronic circuits.
2. Classify appropriate components, software and hardware platforms.
3. Develop a Printed Circuit Board, get it made and populate/solder it with components.
4. Examine the architecture Microcontrollers,CPLD and FPGA
5. Plan to implement an application.

ELECTRICAL AND HYBRID VEHICLES (P E –III) Course Code: GR18A4014

COURSE OUTCOMES:

At the end of this course, students will demonstrate the ability to

1. Summarize various electric drive train topologies.
2. Explain Brake System of EV, HEV, and FCV.
3. Identify various hybrid drive-train topologies
4. Analyze the configuration and control of different motor drives.
5. Discuss the different possible ways of energy storage requirements in Hybrid and Electric Vehicles.

HVDC TRANSMISSION SYSTEMS (Professional Elective –III)

Course Code: GR18A4015

COURSE OUTCOMES: At the end of the course, the student will be able to

1.Compare the differences between HVDC and HVAC transmission.

2. Analyze the rectifier and inverter commutating circuits.

3. Discuss the different control strategies.

4. Estimate the requirement of HVDC filters.

5. Explain the role of AC system faults on HVDC system.

ELECTRICAL ENERGY CONSERVATION AND AUDITING(Professional Elective –III)

Course Code: GR18A4017

Course Outcomes: -

Students will be able to:

1.Understand the current energy scenario and importance of energy conservation.

2.Illustrate the concepts of energy management.

3.Discuss the methods of improving energy efficiency in different electrical systems.

4.Summarize the concepts of different energy efficient devices.

5. Estimate the time and energy of cooling towers

COMPUTER ARCHITECTURE(Professional Elective –III)

Course Code: GR18A4016

Course Outcomes:

At the end of this course, students will be able to

1. List the concepts of microprocessors, their principles and practices.
2. Compile efficient programs in assembly language of the 8086 family of microprocessors.
3. Categorize modern computer system which are relevant to real examples.
4. Discuss the programs in assembly language for 80286, 80386 and MIPS processors in real and protected modes.
5. Conclude embedded applications using ATOM processor.

ADVANCED ELECTRIC DRIVES(Professional Elective –IV)

Course Code GR18A4018

Course Objectives:

1. To Compare different power converters for AC drives
2. To Modeling different control strategies for Induction motor drives
3. To Develop different control strategies for synchronous motor drives, PMSM and BLDC.
4. To Evaluation of Closed loop speed and torque control of switched reluctance motor drives.
5. To Analysis of DSP based motion control.

EHV AC TRANSMISSION(Professional Elective –IV)

Course Code: GR18A4019

Course Outcomes:

At the end of the course the student will be able to

1.Recall the importance of estimating the line parameters of EHV AC transmission lines.

2.Solve the calculations of electrostatic field of AC lines and to cite their effect on voltage gradients.

3.Distinguish energized & un-energized lines and able to point out the requirement of VAR compensation.

4.Elaborate the effect of corona with respect to its characteristics, properties and losses.

5.Identify the design of EHV lines with respect to steady & transient limits.

DIGITAL CONTROL SYSTEMS(Professional Elective –IV)

Course Code: GR18A4020

COURSE OUTCOMES:

At the end of this course, students will demonstrate the ability to

1. Demonstrate discrete representation of LTI systems.
2. Interpret the stability of open loop and closed loop discrete-time systems.
3. Analyze the State Space Approach for discrete time systems
4. Design of different digital controllers.
5. Model state feedback and output feedback controllers.

HIGH VOLTAGE ENGINEERING(Professional Elective –IV)

Course Code: GR18A4021

Course Outcomes:

At the end of the course the student will be able to

1. Recall the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials.
2. Classify the different methods of breakdown mechanisms that occur on application of high voltages.
3. Elaborate the methods of generation of high voltages.
4. Distinguish the procedures for the measurement of D. C., A.C., & Impulse voltages.
5. Explain the various tests on H. V. equipment and on insulating materials.

CONTROL SYSTEMS(Open Elective-II)Course Code: GR18A2032

Course Outcomes:

- Develop the modelling of linear time-invariant systems using transfer function and apply block diagram algebra.
- Explain the concept of time response, stability and its assessment for linear time-invariant systems.
- Compare the Bode and Nyquist plot to determine the stability of a system.

· Determine the dynamic model of a system using state space approach.
. Design of PI,PD controllers and lead ,lag compensators

Course outcomes of EEE IV -II sem

PROGRAMMABLE LOGIC CONTROLLERS Course Code: GR18A4070

Course Outcomes:

At the end of the course the student will be able to

1. Recall the Architecture, I/O Modules and Define programming structure of PLC.
2. Develop the ability to implement ladder diagrams for process control applications.
3. Analyze the working of Registers, Timers, Counters and different PLC functions.
4. Elaborate Data Handling Functions, Bit functions and Robotic Control in PLC.
5. Summarize knowledge of PLC in analog operations

POWER QUALITY and FACTS(Professional Elective –V)

Course Code: GR18A4071

Course Outcomes: -

Students will be able to:

1.Analyze the characteristics of ac transmission and know basic types of FACTS controllers.

2.Adapt FACTS devices for power-flow control, and Discuss the working principles of Shunt compensators and their operating characteristics.

3.Discuss the working principles of Series compensators.

4.Interpret the basic concepts of power quality.

5.Determine the working principles of devices DVR and DSTATCOM, to improve power quality.

POWER SYSTEM DYNAMICS AND CONTROL(Professional Elective –V)

Course Code: GR18A4072

Course Outcomes:

At the end of the course, students will learn the ability to

1. Illustrate the problem of power system stability.
2. Model the different power system components for study of the system.
3. Analyse the linear dynamical system
4. Discuss the methods to improve power system stability.
5. Compose power system models

INDUSTRIAL ELECTRICAL SYSTEMS(Professional Elective –V)

Course Code: GR18A4073

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1.Design the electrical wiring systems for residential, commercial and industrial

2.Show the systems with standard symbols and drawings, SLD.

3.Explain various components of industrial electrical systems.

4.Analyze and select the proper size of various electrical system components.

5. Identify the role of automation in present industrial systems

MODERN POWER ELECTRONICS(Professional Elective –VI)

Course Code: GR18A4074

Course Outcomes: -

Students will be able to:

1. Define the advances in power electronic devices.
2. Articulate power electronic resonant converters in power control applications.
3. Evaluate the design and control of multi-level inverters.
4. Articulate DC power supplies in Power electronic applications
5. Evaluate the design and control of AC power supplies and uninterruptible power supplies.

ELECTRIC SMART GRID (Professional Elective –VI)

Course Code: GR18A4075

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Interpret the concepts and design of smart grid
2. illustrate suitable communications and measurement technology for smart grid
3. make use of various performance analysis tools for smart grid design
4. Apply stability analysis for smart grid
5. Identify sustainable energy options for the smart grid

ADVANCED CONTROL SYSTEMS(Professional Elective –VI)

Course Code: GR18A4076

COURSE OUTCOMES:

At the end of this course, students will able to

1. Design lag, lead and lag lead compensators in frequency domain.
2. Find the stability of Linear and Nonlinear continuous time systems..
3. Identify the concepts of phase-plane analysis to nonlinear control systems.
4. Adapt the concepts of describing function analysis to implement nonlinear control systems.

5. Apply the concepts of controllability and observability to real-world electrical and electronics problems and applications.

ELECTRICAL DISTRIBUTION SYSTEMS (Professional Elective –VI)

Course Code: GR18A4077

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

1. Analyze the characteristics of loads and Perform load modeling.
2. Interpret the design concepts of primary and secondary systems.
3. Classify the substation bus schemes and know the difference between 4&6 feeder patterns and Apply Knowledge of SCADA concepts for functioning of substations.
4. Discuss the coordination procedure of various protective devices.
5. Explain the applications of capacitors,Determine the optimum capacitor location, and know the equipment used for voltage control in distribution systems.

ARTIFICIAL INTELLIGENCE TECHNIQUES(Open Elective -III)

Course Code: GR18A3016

Course outcome

At the end of this course, students will demonstrate the ability to

1. List the importance of designing the System with Artificial Neural Networks.
2. Classify different types of fuzzification and defuzzification methods.
3. Distinguish the various Neural Networks Architectures.
4. Identify the system designed with Fuzzy logic and Neural network
5. Analyze the parameters of Genetic Algorithm.

PRINCIPLES of DIGITAL SIGNAL PROCESSING(Professional Elective –V)

Course Code: GR18A4112

COURSE OUTCOMES:

At the end of this course, students will demonstrate the ability to

1. Interpret the signals mathematically in continuous and discrete-time, and in the frequency domain.
2. Analyse discrete-time systems using z-transform.
3. Make use of Discrete-Fourier Transform (DFT) and FFT algorithms.
4. List digital filters for various applications.
5. Solve problems in digital signal processing for the analysis of real-life signals.