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R. R. Institute of Technology

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Raja Reddy Layout, Chikkabanavara, Bengaluru – 560 090

Electrical & Electronics Engineering

Course Outcomes 2021 Scheme

III SEMESTER

Course Name: CEE201(21MAT31) Transform Calculus, Fourier Series And Numerical Techniques	
CEE201.1	To solve ordinary differential equations using Laplace transform.
CEE201.2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
CEE201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z- Transform techniques to solve difference equations
CEE201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
CEE201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
Course Name: CEE202(21EE32) Analog Electronic Circuits and Op - Amps	
CEE202.1	Obtain the output characteristics of clipper and clamper circuits.
CEE202.2	Design and compare biasing circuits for transistor amplifiers & explain the transistor switching.
CEE202.3	Explain the concept of feedback, its types and design of feedback circuits
CEE202.4	Design and analyse the power amplifier circuits and oscillators for different frequencies.
CEE202.5	Design and analysis of FET and MOSFET amplifiers.
CEE202.6	Demonstrate the application of Op-amps.
Course Name: CEE203(21EE33)Electric Circuit Analysis	
CEE203.1	Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and reduce the complexity of network using source shifting, source transformation and network reduction using transformations.
CEE203.2	Solve complex electric circuits using network theorems.
CEE203.3	Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation.
CEE203.4	Synthesize typical waveforms using Laplace transformation.

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CEE203.5	Solve unbalanced three phase systems and also evaluate the performance of two port networks.
Course Name: CEE204(21EE34) Transformers and Generators	
CEE204.1	Understand the construction and operation of 1-phase, 3-Phase transformers, and Autotransformer.
CEE204.2	Analyze the performance of transformers by polarity test, Sumpner's Test, phase conversion, 3-phase connection, and parallel operation.
CEE204.3	Understand the construction and working of AC and DC Generators
CEE204.4	Analyze the performance of the AC Generators on infinite bus and parallel operation.
CEE204.5	Determine the regulation of AC Generator by Slip test, EMF, MMF, and ZPF Methods.
Course Name: CEE205(21EEL35) Electrical Machines Laboratory - 1	
CEE205.1	Evaluate the performance of transformers from the test data obtained.
CEE205.2	Connect and operate two single phase transformers of different KVA rating in parallel.
CEE205.3	Connect single phase transformers for three phase operation and phase conversion.
CEE205.4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.
CEE205.5	Evaluate the performance of synchronous generators from the test data and assess the performance of synchronous generator connected to infinite bus

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IV SEMESTER

Course Name: CEE211(21MAT41) Complex Analysis, Probability and Statistical Methods	
CEE211.1	Use the concepts of an analytic function and complex potentials to solve the problems arising in electromagnetic field theory. Utilize conformal transformation and complex integral arising i**IV SEMESTER** n aerofoil theory, fluid flow visualization and image processing.
CEE211.2	Obtain Series Solutions of Ordinary Differential Equation.
CEE211.3	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
CEE211.4	Apply discrete and continuous probability distributions in analysing the probability models arising in the engineering field.
CEE211.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
Course Name: CEE212(21EE42) Digital System Design	
CEE212.1	Develop simplified switching equation using Karnaugh Maps and QuineMcClusky techniques.
CEE212.2	Design Multiplexer, Encoder, Decoder, Adder, Subtractors and Comparator as digital combinational control circuits.
CEE212.3	Design flip flops, counters, shift registers as sequential control circuits.
CEE212.4	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits.
CEE212.5	Explain the functioning of Read only and Read/Write Memories, Programmable ROM, EPROM and Flash memory.
CEE212.6	Realize Boolean expressions, adders and subtractors using gates.
CEE212.7	Design and test Ring counter/Johnson counter, Sequence generator and 3 bit counters.
Course Name: CEE213(21EE43) Microcontroller	
CEE213.1	Outline the 8051 architecture, registers, internal memory organization, addressing modes.
CEE213.2	Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming.

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CEE213.3	Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.
CEE213.4	Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.
CEE213.5	Program 8051to work with external devices for ADC, DAC, Stepper motor control, DC motor control.
Course Name: CEE214(21EE44) Electric Motors	
CEE214.1	At the end of the course the student will be able to:
CEE214.2	Explain the construction, operation and classification of DC Motor, AC motor and special purpose motors.
CEE214.3	Describe the performance characteristics and applications of Electric motors.
CEE214.4	Demonstrate and explain the methods of testing of DC machines and determine losses and efficiency.
CEE214.5	Control the speed of DC motor and induction motor.
CEE214.6	Explain the starting methods, equivalent circuit and phasor diagrams, torque angle, effect of change in excitation and change in load, hunting and damping of synchronous motors.
Course Name: CEE215(21EEL46)Electrical Machines Laboratory - 2	
CEE215.1	Test DC machines to determine their characteristics and also to control the speed of DC motor.
CEE215.2	Pre-determine the performance characteristics of DC machines by conducting suitable tests.
CEE215.3	Perform load test on single phase and three phase induction motor to assess its performance.
CEE215.4	Conduct test on induction motor to pre-determine the performance characteristics.
CEE215.5	Conduct test on synchronous motor to draw the performance curves
Course Name: CEE215(21EEL483)Scilab for Electrical and Electronic Measurements	
CEE216.1	Analyse in a systematic way, think better, and perform better.

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Course Name: CEE301(21EE51) Transmission and Distribution	
CEE301.1	Explain transmission and distribution scheme, identify the importance of different transmission systems and types of insulators.
CEE301.2	Analyze and compute the parameters of the transmission line for different configurations.
CEE301.3	Assess the performance of overhead lines.
CEE301.4	Interpret corona, explain the use of underground cables.
CEE301.5	Classify different types of distribution systems; examine its quality & reliability.
Course Name: CEE302(21EE52) Control Systems	
CEE302.1	Analyze and model electrical and mechanical system using analogous.
CEE302.2	Formulate transfer functions using block diagram and signal flow graphs.
CEE302.3	Analyze the stability of control system, ability to determine transient and steady state time response.
CEE302.4	Illustrate the performance of a given system in time and frequency domains, stability analysis using Root locus and Bode plots.
CEE302.5	Discuss stability analysis using Nyquist plots, Design controller and compensator for a given specification.
CEE302.6	Utilize software package and discrete components in assessing the time and frequency domain response of a given second order system.
CEE302.7	Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications.
CEE302.8	Determine the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems.
CEE302.9	Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system.
Course Name: CEE303(21EE53) Power System Analysis - 1	
CEE303.1	Model the power system components & construct per unit impedance diagram of power system.
CEE303.2	Analyze three phase symmetrical faults on power system.
CEE303.3	Compute unbalanced phasors in terms of sequence components and vice versa, also develop sequence networks.

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CEE303.4	Analyze various unsymmetrical faults on power system.
CEE303.5	Examine dynamics of synchronous machine and determine the power system stability.
Course Name: CEE304(21EE54) Power Electronics	
CEE304.1	To give an overview of applications power electronics, different types of power semiconductor devices, their switching characteristics, power diode characteristics, types, their operation and the effects of power diodes on RL circuits.
CEE304.2	To explain the techniques for design and analysis of single phase diode rectifier circuits.
CEE304.3	To explain different power transistors, their steady state and switching characteristics and limitations.
CEE304.4	To explain different types of Thyristors, their gate characteristics and gate control requirements.
CEE304.5	To explain the design, analysis techniques, performance parameters and characteristics of controlled rectifiers, DC- DC, DC -AC converters and Voltage controllers.
Course Name: CEE305(21EEL55) Power Electronics Laboratory	
CEE305.1	Obtain static characteristics of semiconductor devices to discuss their performance.
CEE305.2	Trigger the SCR by different methods
CEE305.3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads.
CEE305.4	Control the speed of a DC motor, universal motor and stepper motors.
CEE305.5	Verify the performance of single phase full bridge inverter connected to resistive load.

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Course Name: CEE311(21EE61) Management and Entrepreneurship	
CEE311.1	Explain the field of management, task of the manager, planning and steps in decision making.

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CEE311.2	Discuss the structure of organization, importance of staffing, leadership styles, modes of communication,techniques of coordination and importance of managerial control in business.
CEE311.3	Explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups
CEE311.4	Show an understanding of role of SSI's in the development of country and state/central level institutions/ agencies supporting business enterprises.
CEE311.5	Discuss the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques
Course Name: CEE312(21EE62) Power System Analysis - 2	
CEE312.1	Formulate network matrices and models for solving load flow problems.
CEE312.2	Perform steady state power flow analysis of power systems using numerical iterative techniques.
CEE312.3	Solve issues of economic load dispatch and unit commitment problems.
CEE312.4	Analyze short circuit faults in power system networks using bus impedance matrix.
CEE312.5	Apply Point by Point method and Runge Kutta Method to solve Swing Equation.
CEE312.6	Develop a program in suitable package to assess the performance of medium and long transmissionlines.
CEE312.7	Develop a program in suitable package to obtain the power angle characteristics of salient and non-salientpole alternator.
CEE312.8	Develop a program in suitable package to assess the transient stability under three phase fault at differentlocations in a of radial power systems.
Course Name: CEE313(21EE63) Signals and Digital Signal Processing	
CEE313.1	Discuss classification and basic operations that can be performed on both continuous and discrete time signals.
CEE313.2	Evaluate Discrete Fourier Transform of a sequence and the convolution of two sequences to determine the output sequence.
CEE313.3	Evaluate Discrete Fourier Transform of a sequence by using fast methods.
CEE313.4	Design Butterworth and Chebyshev IIR digital filters and FIR filters using different techniques.
CEE313.5	Develop different structures for IIR and FIR filters.
Course Name: CEE314(21EE641) Sensors and Transducers	
CEE314.1	Classify the transducers and explain the need of transducers, their classification, advantages and disadvantages.
CEE314.2	Explain the working of various transducers and sensors.
CEE314.3	Outline the recent trends in sensor technology and their selection
CEE314.4	Analyze the signal conditioning and signal conditioning equipment.

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CEE314.5	Illustrate different configuration of Data Acquisition System and data conversion.
CEE314.6	Show knowledge of data transmission and telemetry.
CEE314.7	Explain measurement of non-electrical quantities -temperature, flow, speed, force, torque, power and viscosity.
Course Name: CEE315(21EE642)Electromagnetic Field Theory	
CEE315.1	Use different coordinate systems, Coulomb's Law and Gauss Law for the evaluation of electric fieldsproduced by different charge configurations.
CEE315.2	Calculate the energy and potential due to a system of charges & Explain the behavior of electric field acrossa boundary conditions.
CEE315.3	Explain the Poisson's, Laplace equations and behavior of steady magnetic fields.
CEE315.4	Explain the behavior of magnetic fields and magnetic materials.
CEE315.5	Asses time varying fields and propagation of waves in different media.
Course Name: CEE316(21EE651)Utilization of Electrical Power	
CEE316.1	Discuss different methods of electric heating & welding.
CEE316.2	Discuss the laws of electrolysis, extraction, refining of metals and electro deposition process.
CEE316.3	Discuss the laws of illumination, different types of lamps, lighting schemes and design of lighting systems.
CEE316.4	Analyze systems of electric traction, speed time curves and mechanics of train movement.
CEE316.5	Explain the motors used for electric traction, their control & braking and power supply system used for electric traction.
Course Name: CEE317(21EEL66)Digital Signal Processing Laboratory	
CEE317.1	Conduct sampling of signals in time and frequency domains.
CEE317.2	Evaluate the impulse response of a system.
CEE317.3	Obtain convolution of given sequences to evaluate the response of a system.
CEE317.4	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods.
CEE317.5	Provide a solution for a given difference equation.
CEE317.6	Design and implement IIR and FIR filters.

VII SEMESTER

Course Name: CEE401(21EE71)High Voltage and Power System Protection	
CEE401.1	Apply the knowledge of dielectric property for insulation, it's performances as per Standards and High voltage application in power system Equipment's.

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CEE401.2	Analyze the circuits of high voltages, high currents in Generation and Measurements.
CEE401.3	Apply relays to the power system protection.
CEE401.4	Discuss the construction, operating principles and performances of circuit breaker.
CEE401.5	Discuss protection of generators, motors, Transformer and Bus Zone Protection.
Course Name: CEE402(21EE72)Power System Operation and Control	
CEE402.1	Describe various levels of controls in power systems, architecture and configuration of SCADA.
CEE402.2	Develop and analyze mathematical models of Automatic Load Frequency Control.
CEE402.3	Develop mathematical model of Automatic Generation Control in Interconnected Power system.
CEE402.4	Discuss the Control of Voltage, Reactive Power and Voltage collapse.
CEE402.5	Explain security, contingency analysis, and state estimation of power systems.
Course Name: CEE403(21EE721)Power System Planning	
CEE403.1	Discuss primary components of power system planning, planning methodology for optimum power system expansion and load forecasting.
CEE403.2	Understand economic appraisal toallocate the resources efficiently and appreciate the investment decisions
CEE403.3	Discuss expansion of power generation and planning for system energy in the country, evaluation of operating states of transmission system, their associated contingencies and the stability of the system.
CEE403.4	Discuss principles of distribution planning, supply rules, network development and the system studies
CEE403.5	Discuss reliability criteria for generation, transmission, distribution and reliability evaluation and analysis, grid reliability, voltage disturbances and their remedies.
Course Name: CEE404(21EE724)Electrical Vehicle Technologies	
CEE404.1	Explain the working of electric vehicles and recent trends.
CEE404.2	Analyze different power converter topology used for electric vehicle application.
CEE404.3	Develop the electric propulsion unit and its control for application of electric vehicles.
CEE404.4	Design converters for battery charging and explain transformer less topology.
Course Name: CEE405(21EE742)Electric Vehicles	
CEE403.1	Explain the roadway fundamentals, laws of motion, vehicle mechanics and propulsion system design.
CEE403.2	Explain the working of electric vehicles and hybrid electric vehicles in recent trends.
CEE403.3	Model batteries, Fuel cells, PEMFC and super capacitors.
CEE403.4	Analyze DC and AC drive topologies used for electric vehicle application.
CEE403.5	Develop the electric propulsion unit and its control for application of electric vehicles.