College Code: 7Q

BRILLIANT GRAMMAR SCHOOL EDUCATIONAL SOCIETY'S
GROUP OF INSTITUTIONS-INTEGRATED CAMPUS
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Electrical & Electronics Engineering I & II Sem Course outcomes for the

Academic year 2020- 2021

S.NO.	YEAR/ SEM	COURSE NAME	Course Outcomes
1	II/I	Engineering Mechanics	**CO1:** Determine resultant of forces acting on a body and analyse equilibrium of a body subjectedto a system of forces.
			CO2: Solve problem of bodies subjected to friction.
			CO3: Find the location of centroid and calculate moment of inertia of a given section.
			CO4: Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatorymotion and rigid body motion.
			CO5: Solve problems using work energy equations for translation, fixed axis rotation and planemotion and solve problems of vibration.
2	II/I	Electrical Circuit Analysis	**CO1:** Apply network theorems for the analysis of electrical circuits.
			CO2: Obtain the transient and steady-state response of electrical circuits.
			CO3: Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
			CO4: Analyze two port circuit behavior.
			CO1: Know the characteristics, utilization of various components.
			CO2: Understand the biasing techniques

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3	**II/I**	**Analog Electronics**	
			CO3: Design and analyze various rectifiers, small signal amplifier circuits.
			CO4: Design sinusoidal and non-sinusoidal oscillators.
			CO5: A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linearintegrated circuits
4	**II/I**	**Electrical Machines - I**	**CO1**: Identify different parts of a DC machine & understand its operation
			CO2: Carry out different testing methods to predetermine the efficiency of DC machines
			CO3:. Understand different excitation and starting methods of DC machines
			CO4: Control the voltage and speed of a DC machines
			CO5 Analyze single phase and three phase transformers circuits.
5	**II/I**	**Electromagne**	**CO1:** To understand the basic laws of electromagnetism.
			CO2: To obtain the electric and magnetic fields for simple configurations under static conditions.
			CO3: To analyze time varying electric and magnetic fields.
			CO4: To understand Maxwell's equation in different forms and different media.

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		tic Fields	**CO5:** To understand the propagation of EM waves.
6	**II/I**	**Electrical Machines Lab –I**	**CO1:** Start and control the Different DC Machines
			CO2: Assess the performance of different machines using different testing methods
			CO3: Identify different conditions required to be satisfied for self - excitation of DC Generators.
			CO4: Separate iron losses of DC machines into different components
7	**II/I**	**Analog Electronics Lab**	**CO1:** Know the characteristics, utilization of various components.
			CO2: Understand the biasing techniques
			CO3: Design and analyze various rectifiers, small signal amplifier circuits
			CO4: Design sinusoidal and non-sinusoidal oscillators.
			CO5: A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits.
			CO1: Use the Laplace transforms techniques for solving ODE's

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8	II/II	**Laplace Transforms, Numerical Methods And Complex Variables**	**CO2:** Find the root of a given equation.
			CO3: Estimate the value for the given data using interpolation
			CO4: Find the numerical solutions for a given ODE's
			CO5: Analyze the complex function with reference to their analyticity, integration using Cauchy'sintegral and residue theorems
			CO6: Taylor's and Laurent's series expansions of complex function
9	II/II	**Electrical Machines – Ii**	**CO1:** Understand the concepts of rotating magnetic fields.
			CO2: Understand the operation of ac machines
			CO3: Analyze performance characteristics of ac machines.
10	II/II	**Digital Electronics**	**CO1:** Understand working of logic families and logic gates.
			CO2: Design and implement Combinational and Sequential logic circuits.
			CO3: Understand the process of Analog to Digital conversion and Digital to Analog conversion .
			CO4: Be able to use PLDs to implement the given logical problem.
			CO1: Understand the modeling of linear-time-invariant systems using

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11	II/II	Control Systems	transfer function and state-space representations
			CO2: Understand the concept of stability and its assessment for linear-time invariant systems
			CO3: Design simple feedback controllers.
12	II/II	Power System-I	**CO1:** Understand the concepts of power systems
			CO2: Understand the operation of conventional generating stations and renewable sources ofelectrical power.
			CO3: Evaluate the power tariff methods
			CO4: Determine the electrical circuit parameters of transmission lines
			CO5: Understand the layout of substation and underground cables and corona.
13	II/II	Digital Electronics Lab	**CO1:** Understand working of logic families and logic gates.
			CO2: Design and implement Combinational and Sequential logic circuits.
			CO3: Understand the process of Analog to Digital conversion and Digital to Analog conversion.
			CO4: Be able to use PLDs to implement the given logical problem.

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14	**II/II**	**Electrical Machines Lab –II**	**CO1:** Assess the performance of different machines using different testing methods
			CO2: To convert the Phase from three phase to two phase and vice
			CO3: Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods
			CO4: Control the active and reactive power flows in synchronous machines
			CO5: Start different machines and control the speed and power factor
15	**II/II**	**Control Systems Lab**	**CO1:** How to improve the system performance by selecting a suitable controller and/or acompensator for a specific application
			CO2: Apply various time domain and frequency domain techniques to assess the systemperformance
			CO3: Apply various control strategies to different applications(example: Power systems, electricaldrives etc)
			CO4: Test system controllability and observability using state space representation and applicationsof state space representation to various systems
16	**III/I**	**Power Electronics**	**CO1:** Understand the differences between signal level and powerlevel devices.
			CO2: Analyze controlled rectifier circuits.

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			CO3: Analyze the operation of DC-DC choppers.
			CO4: Analyze the operation of voltage source inverters.
17	**III/I**	**Power System –II**	**CO1:** Analyze transmission line performance.
			CO2: Apply load compensation techniques to control reactive power
			CO3: Understand the application of per unit quantities
			CO4: Design over voltage protection and insulation coordination
			CO5: Determine the fault currents for symmetrical and unbalanced fault
18	**III/I**	**Measurements And Instrumentation**	**CO1:** Understand different types of measuring instruments, their construction, operation andcharacteristics
			CO2: Identify the instruments suitable for typical measurements
			CO3: Apply the knowledge about transducers and instrument transformers to use them effectively.
			CO4: Apply the knowledge of smart and digital metering for industrial applications
19	**III/I**	**High Voltage Engineering**	**CO1:** Understand the basic physics related to variousbreakdown processes in solid, liquid andgaseous insulating materials
			CO2: Knowledge of generation and measurement of D.C,A.C,& Impulse voltages.
			CO3: Knowledge of tests on H. V. equipment and on insulating materials, as per the standards.
			CO4: Knowledge of how over-voltages arise in a power system, and

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			protection against these over-voltages.
20	III/I	**Business Economics And Financial Analysis**	**CO1:**The students will understand the various Forms of Business and the impact of economic variables on the Business
			CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
			CO3: Students can study the firm's financial position
			CO4: by analyzing the Financial Statements of a Company.
21	III/I	**Power System Simulation Lab**	**CO1:** Perform various transmission line calculations
			CO2: Understand Different circuits time constants
			CO3: Analyze the experimental data and draw the conclusions.
22	III/I	**Power Electronics Lab**	**CO1:** Understand the operating principles of various power electronic converters.
			CO2: Use power electronic simulation packages& hardware to develop the power converters.
			CO3: Analyze and choose the appropriate converters for various applications
23	III/ II	**Disaster Preparedness & Planning Management**	**CO1:** the application of Disaster Concepts to Management
			CO2: Analyzing Relationship between Development and Disasters
			CO3: Ability to understand Categories of Disasters
			CO4: Realization of the responsibilities to society.
24	III/II	**Power**	**CO1:** Identify the drawbacks of speed control of motor by conventional

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		Semiconductor Drives	methods.
			CO2: Differentiate Phase controlled and chopper-controlled DC drives speed-torque characteristicsmerits and demerits
			CO3: Understand Ac motor drive speed–torque characteristics using different control strategies itsmerits and demerits
			CO4: Describe Slip power recovery schemes
25	**III /II**	**Signals & Systems**	**CO1:** Differentiate various signal functions.
			CO2: Represent any arbitrary signal in time and frequency domain.
			CO3: Understand the characteristics of linear time invariant systems
			CO4: Analyze the signals with different transform technique
26	**III/II**	**Microprocessors & Microcontrollers**	**CO1:** Understands the internal architecture, organization and assembly language programming of8086 processors.
			CO2: Understands the internal architecture, organization and assembly language programming of8051/controllers
			CO3: Understands the interfacing techniques to 8086 and 8051 based systems.
			CO4: Understands the internal architecture of ARM processors and basic concepts of advanced ARMprocessors.
27	**III/II**	**Power System Protection**	**CO1:** Compare and contrast electromagnetic, static and microprocessor-based relays
			CO2: Apply technology to protect power system components
			CO3: Select relay settings of over current and distance relays.
			CO4: Analyze quenching mechanisms used in air, oil and vacuum circuit breakers

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28	III/II	Power System Lab	**CO1:** Perform various load flow techniques
			CO2: Understand Different protection methods
			CO3: Analyze the experimental data and draw the conclusions.
29	III/II	Microprocessors & Microcontrollers Lab	**CO1:** Assembly Language Programs to 8086to Perform 1. Arithmetic, Logical, String Operations on 16 Bit and 32-Bit Data.
			CO2: Bit level Logical Operations, Rotate, Shift, Swap and Branch Operations.
			CO3: Assembly Language Programs to Perform Arithmetic (Both Signed and Unsigned) 16 Bit Data Operations, Logical Operations (Byte and Bit Level Operations), Rotate, Shift, Swap and Branch Instructions
			CO4: Time delay Generation Using Timers of 8051
			CO5: Serial Communication from / to 8051 to / from I/O devices
30	III/II	Signals and Systems lab	**CO1:** Understand the concepts of continuous time and discrete time systems.
			CO2: Analyse systems in complex frequency domain
			CO3: Understand sampling theorem and its implications.

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31	IV/I	**Artificial Intelligence**	**CO1:** To learn the distinction between optimal reasoning Vs. human like reasoning
			CO2: To understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
			CO3: To learn different knowledge representation techniques.
			CO4: To understand the applications of AI, namely game playing, theorem proving, and machine learning.
32	IV/I	**Digital Signal Processing**	**CO1:** Understand the LTI system characteristics and Multirate signal processing
			CO2: Understand the inter-relationship between DFT and various transforms.
			CO3: Design a digital filter for a given specification
			CO4: Understand the significance of various filter structures and effects of round off errors
33	IV/I	**Hvdc Transmission**	**CO1:** Compare EHV AC and HVDC system and to describe various types of DC links
			CO2: Analyze Graetz circuit for rectifier and inverter mode of operation
			CO3: Describe various methods for the control of HVDC systems and to perform power flow analysisin AC/DC systems
			CO4: Describe various protection methods for HVDC systems and classify Harmonics and designdifferent types of filters
34	IV/I		**CO1:** The students understand the significance of Management in their

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		Fundamentals Of Management For Engineers	Profession
			CO2: various Management Functions like Planning, Organizing, Staffing, Leading, Motivation
			CO3: Control aspects are learnt in this course.
			CO4: The students can explore the Management Practices in their domain area.
35	**IV/I**	**Electrical & Electronics Design Lab**	**CO1:** Get practical knowledge related to electrical
			CO2: Fabricate basic electrical circuit elements/networks
			CO3: Trouble shoot the electrical circuits
			CO4: Get hardware skills such as soldering, winding etc.
36	**IV/II**	**Non-Conventional Sources Of Energy**	**CO1:** Identify renewable energy sources and their utilization. Understand the basic concepts of solar radiation and analyze the working of solar and thermal systems.
			CO2: Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, biogas and hydrogen
			CO3: Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator.
			CO4: Identify methods of energy storage for specific applications
37	**IV/II**	**Power Quality &**	**CO1:** Know the severity of power quality problems in distribution system
			CO2: Understand the concept of voltage sag transformation from up-stream (higher voltages) todown-stream (lower voltage)
			CO3: Concept of improving the power quality to sensitive load by

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		Facts	various mitigating custom powerdevices
			CO4: Choose proper controller for the specific application based on system requirements
			CO5: Understand various systems thoroughly and their requirements
			CO6: Understand the control circuits of Shunt Controllers SVC & STATCOM for various functions viz.Transient stability Enhancement, voltage instability prevention and power oscillation damping
			CO7: Understand the Power and control circuits of Series Controllers GCSC, TSSC and TCSC
38	**IV/II**	**Electrical Distribution Systems**	**CO1:** distinguish between transmission, and distribution line and design the feeders
			CO2: compute power loss and voltage drop of the feeders
			CO3: design protection of distribution systems
			CO4: understand the importance of voltage control and power factor improvement

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