DNR COLLEGE OF ENGINEERING & TECHNOLOGY, Bhimavaram

CO attainment– Internal exams

Program Name:	B.Tech. in Electrical & Electronics Engineering	AY	2020-21

IV-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
DCS	3	3	3	3	3	3
HVDC	3	3	3	3	3	2.67
EDS	3	3	3	3	3	2
HVE	3	3	3	3	3	1
SEMINAR	3	3	3	3	3	3
PROJECT	3	3	3	3	3	3
	CO7	CO8	CO9	CO10	CO11	CO12
	3	3	3	3	3	3

IV-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
LICA	2.5	2.5	2.2	2.5	2.5	2.5
PSOC	2.3	2	2	2.66	2.66	2.66
SGP	2.33	2.33	2.33	2.33	2.33	2.33
INST	3	3	3	3	3	3
EPQ	2.33	2	2	2.33	2.33	2.33
UEE	3	3	3	3	3	2
E-SIM LAB	3	3	3	3	3	
PS-SIM LAB	3	2	3	3	3	3

III-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
PECD	3	3	3	3	3	2.6
PSA	2.6	2.66	2	2.3	2.6	2.3
MP&MC	2.66	2.33	2.33	2.33	2.66	2.66
DS	3	2	2	3	3	2
UNIX	3	2	2	2	2	3
PELAB	3	3	3	3	3	3
MPMC LAB	3	3	3	3	3	3
DS LAB	3	3	3	3	3	3
PE&HV	3	3	3	3	3	3

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BHIMAVARAM-534 202.

III-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
PS-II	2.33	2.33	1.66	2.33	2.33	1.66
RESS	3	3	3	3	3	2.6
S&S	1.66	2.33	2	2.33	2.33	1.66
PDC	1.67	2.33	1.67	2.33	1.67	2.33
PE	2.6	2.6	2.6	2	1.5	1.6
EM-II LAB	3	3	3	3	3	3
CS LAB	3	3	3	3	3	
EM LAB	3	3	3	3	3	
IPR&PATENTS	3	3	3	3	3	

II-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
EM&I	2.67	2.33	2.33	3	2.67	2.33
EM-II	1	3	3	3	1	2
DE	3	3	3	3	3	2
CS	3	3	3	3	3	2
PS-I	3	3	3	3	1.6	2.6
S&S	3	2.6	2.6	2.6	3	3
EM-1 LAB	3	3	3	3	3	3
EDC LAB	2.2	1	1	1	1	2.33
PE&HV	3	3	3	3	3	3

II-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
MEFA	1.66	2.33	2.33	2	2	2
T&HP	2	2	2	1.33	1.33	2.33
ECA-II	3	1	2	2	1	2
EDC	1.67	1	1	3	3	
EM-I	2.33	1.67	1.67	2.33	2.33	2.33
EMF	2.33	3	3	3	3	2.66
T&HP LAB	2.5	3	2.66	2	2.5	2
ECLAB	3	3	3	3	3	
EI&TK	3	3	3	3	3	

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BHIMAVARAM-534 202.

DNR COLLEGE OF ENGINEERING & TECHNOLOGY, Bhimavaram

CO attainment– University exams

Program Name:	B.Tech. in Electrical & Electronics Engineering	AY	2020-21

IV-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
DCS	2	2	2	2	2	2
HVDC	3	3	3	3	3	3
EDS	3	3	3	3	3	3
HVE	3	3	3	3	3	3
SEMINAR	3	3	3	3	3	3
PROJECT	3	3	3	3	3	3
	CO7	CO8	CO9	CO10	CO11	CO12
	3	3	3	3	3	3

IV-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
LICA	1	1	1	1	1	1
PSOC	3	3	3	3	3	3
SGP	2	2	2	2	2	2
INST	3	3	3	3	3	3
EPQ	3	3	3	3	3	3
UEE	3	3	3	3	3	3
E-SIM LAB	3	3	3	3	3	3
PS-SIM LAB	3	3	3	3	3	3

III-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
PECD	2	2	2	2	2	2
PSA	2	2	2	2	2	2
MP&MC	0	0	0	0	0	0
DS	1	1	1	1	1	1
UNIX	1	1	1	1	1	1
PELAB	3	3	3	3	3	3
MPMC LAB	3	3	3	3	3	3
DS LAB	3	3	3	3	3	3
PE&HV	3	3	3	3	3	3

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III-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
PS-II	1	1	1	1	1	1
RESS	3	3	3	3	3	3
S&S	1	1	1	1	1	1
PDC	1	1	1	1	1	1
PE	1	1	1	1	1	1
EM-II LAB	3	3	3	3	3	3
CS LAB	3	3	3	3	3	3
EM LAB	3	3	3	3	3	3
IPR&PATENTS	3	3	3	3	3	3

II-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
EM&I	2	2	2	2	2	2
EM-II	2	2	2	2	2	2
DE	2	2	2	2	2	2
CS	1	1	1	1	1	1
PS-I	1	1	1	1	1	1
S&S	2	2	2	2	2	2
EM-1 LAB	3	3	3	3	3	3
EDC LAB	3	3	3	3	3	3
PE&HV	3	3	3	3	3	3

II-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
MEFA	2	2	2	2	2	2
T&HP	2	2	2	2	2	2
ECA-II	2	2	2	2	2	2
EDC	1	1	1	1	1	1
EM-I	2	2	2	2	2	2
EMF	1	1	1	1	1	1
T&HP LAB	3	3	3	3	3	3
ECLAB	3	3	3	3	3	3
EI&TK	3	3		3	3	3

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DNR COLLEGE OF ENGINEERING & TECHNOLOGY, Bhimavaram

CO PO Mappings

Program Name:	B.Tech. in Electrical & Electronics Engineering	AY	2020-21

COURSE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C211	3	1.3	1	1.5								
C212	3		2		1.5	1.5						
C213	2.16	2.5	2								1	
C214	3	2.5	2	2								
C215	3	1.67	0.6									
C216				3	3		2.3	2			2.5	2.33
C217	2.6	3	1			1	2		1.9	1		1.75
C218	3	3	3	3		1						2
C219						3	3	2.6	2.83		1	1.83
C221	3		2		1.5							
C222	2.6	1.83	1.66	1								
C223	3	2.5	2	1								2
C224	3	2	1	1.16	1							1
C225	2.5	2	2.67			1						1
C226	2.83	2	2.5	1.83		2.5					1	
C227	3	2.5	1.8	2.2								
C228	3	2.5	2.2	1.66								2
C229	1.5	2	1	1			1	3	2	1		2.8
C311	2.5	1.83	1.66	1							1	
C312	3	1.67	1	2.5								
C313	2.8	2	2.5	2.33	2.16							
C314	2.16	2.5	2.33									1
C315	3	2.5	2	2.4	2						1	2
C316	2	2.3	2.4	2.2	2.2							
C317	3	2	1.6	2		1					1.2	1
C318	3	3	3	2		1						
C319						2		2				2.4
C321	2.3	2.67	2.16	2	1.5	2.16						
C322	2.5	1	1	1	1	1						
C323	3	2.4	3	3							2	1
C324	2	2.5	2.8	2.2		2						
C325	2.5	1.83	1.66	2								
C326	2	2.3	2.4	2.2	2.2							
C327	2.6	2.3	2.4	1.83	2.2							
C328	2	2.3	2.4	2.2	2.2							
C329	1.5	2	1	1			1	3	2	1		2.8
C411	2.3	1.83	2.5	1.66								
C412	3	2.3	2	1								
C413	2.83	1.83	2.33	1.67								

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C414	3	1.5	1.5		2				1.5		1.5	
C415	2.5	2.16	1.83	1.66								
C416	3	1.33	1.5	1.66		1						
C417	2.6	2.3	2.4	1.83	2.2							
C418	3	2			2				2			
C421	3	2	1.83	1.83								
C422	3	1.67	2.5	1.5	1.83							
C423	3	1	1	1.146	1							
C424	3	2	1	1.16	1							
C425						2	2	2	2	2	2	
C426	2.1	2.6	2.7	2	2.6	2	2	2.8	3	2	2	2

Coordinator

M. Ayyankumar

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CO PSO Mappings

Program Name:	B.Tech. in Electrical & Electronics Engineering	AY	2020-21

Course	PSO1	PSO2
C211	2	2
C212	2	2
C213	2	2
C214	1.5	1
C215	2	2
C216	2	2
C217	1.5	1.6
C218	1	1.5
C219	-	-
C221	1	1
C222	1	1
C223	1.5	1.5
C224	2	1.5
C225	2	1
C226	2	1
C227	2	2
C228	1.5	1.5
C229	-	-
C311	1	1
C312	2	1
C313	2	2
C314	2	2
C315	2	2
C316	2	2
C317	1.5	1.5
C318	2	1
C319	-	-
C321	2.25	2.3
C322	2	2
C323	2	1
C324	2	1
C325	1	1
C326	2	2
C327	1.8	2
C328	1.5	1.16
C329	-	-
C411	2	2
C412	2	2
C413	2	2
C414	1.66	1.5
C415	2	1.5
C416	2	2
C417	2	2
C418	1.5	1.67
C421	2	2
C422	1	1
C423	2	2
C424	2	3
C425	2.2	2.1
C426	2	1

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DNR COLLEGE OF ENGINEERING & TECHNOLOGY, Bhimavaram

Course outcomes

Program Name:	B.Tech. in Electrical & Electronics Engineering	**Academic Year**	2020-21
Class / Sem	IV-II	Regulation	R16

CO Statement –Digital control systems
Understand the advantages of discrete time control systems and various associated accessories.
Analyse of z–transformations and their role in the mathematical analysis of different systems (like Laplace transforms in analog systems).
Apply state space analysis for concepts of Controllability and Observability
Evaluate the stability criterion for digital systems and methods adopted for testing the digital systems
Design of discrete–time control systems by conventional methods
Design of State feedback controllers.

CO Statement- HVDC TRANSMISSION
Explain the different types of HVDC links.
Define firing angle control of 6 pulses, 12 pulse circuits.
Analyse the HVDC Converter operation.
Describe the control concept of reactive power control and AC/DC load flow.
Choose converter faults, protection and harmonic effects
Design low pass and high pass filters

CO Statement-ELECTRICAL DISTRIBUTION SYSTEM
Explain the relation between load factor and loss factor.
Design a radial and loop type distribution feeder.
Calculate the voltage drop and power loss in a distribution system.
Analyze the coordination between various protective devices.
Discuss the need of pf correction
Explain the importance of Voltage Control

CO Statement-HIGH VOLTAGE ENGINEERING
Outline the importance of insulation for the High Voltage equipments
Distinguish different methods of breakdown mechanisms in gaseous, liquid and solid media
Discuss about the principle of operation of High voltage DC,AC and Impulse voltages and currents
Apply the knowledge of different methods and techniques for generation and measurement of high DC,AC and Impulse voltages and currents
Explain the Partial Discharge measurement techniques
Explain about various testing techniques of HV equipments

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CO Statement-SEMINAR
Develop motivation for any topic of interest and develop a thought process for technical presentation
Create a detailed literature survey and build a document.
Analysis and comprehension of proof-of-concept and related data.
Explain Effectively the presentation and improve soft skills
Create use of new and recent technology (e.g. Latex) for creating technical reports

CO Statement-PROJECT
Identify right problem and come with abstract for the proposed problem.
Build a prospective solution based on recent literature survey and data gathering.
Identify the various resources and components required to complete project.
Solve the problem by creating a working model implementation or simulation study using a tool.
Justify the project work progress to a panel of experts in the form of written report and presentation.
Conduct Experimental or simulation studies and take observations, analyze and conclude the results.
Develop a module using appropriate syntax.
Fabricate a working model or Apply software tool to solve the problem.
Prepare a thesis as per given university guidelines for the project taken up.
Plan the tasks required the for the project and split among team for execution and complete the project within the stipulated time
Express the contribution towards the project as a team member while submitting the report.
Participate in computations or expos or technical publications to demonstrate the project outcomes.

Coordinator

M. Ayankumar
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Course outcomes

Program Name:	B.Tech. in Electrical & Electronics Engineering	**Academic Year**	2020-21
Class / Sem	IV-I	Regulation	R16

CO Statement – LINEAR IC APPLICATIONS
Estimate energy consumption levels at various modes of operation.
Design circuits using operational amplifiers for various applications.
Explore various Transistor Current Sources and Differential amplifiers
Analyze and design amplifiers and active filters using Op-amp
Diagnose and trouble-shoot linear electronic circuits.
Analyze the gain-bandwidth concept and frequency response of the amplifier configurations.
Develop ADC and DAC Circuits in different applications

CO Statement – POWER SYSTEM OPERATION AND CONTROL
Evaluate thermal power generation for economic operation with & without transmission losses.
Evaluate hydro- thermal power generation mix for economic operation with & without transmission losses
Solve the unit commitment problems using iterative technique satisfying equality and inequality constraints for optimal solution.
Explain load frequency control & estimate the frequency deviation through modeling.
Compute steady state error for changes in load demand & design controller to minimize the error for single area and two area systems
Choose and model controllers for reactive power compensation in a system to improve system voltage.

CO Statement – SWITCHGEAR AND PROTECTION
Explain the principle of operation of various Circuit Breakers
Classify various types of relays with their characteristics
Apply the Knowledge of various protective schemes for Generators and Transformers
Choose suitable protective scheme for the protection of feeders & bus bars.
Illustrate various static relays
Discuss the concept of over voltages and methods of neutral grounding

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CO Statement – INSTRUMENTATION
Develop proper knowledge and the ability to handle various types of signal analyzers
Illustrate the effectiveness of the Transducer.
Explain the operations of the various instruments required in measurements.
Demonstrate the principle of operation, working of different electronic instruments like digital Volt meter.
Measure various parameters like phase and frequency of a signal with the help of CRC.
Explain the functioning, specification, and applications of signal Analysing Instruments

CO Statement – ELECTRIC POWER QUALITY
Differentiate between different types of power quality problems.
Explain the sources of voltage sag, voltage swell, interruptions, transients, long duration over voltages and harmonics in a power system.
Analyze power quality terms and power quality standards.
Explain the principle of voltage regulation and power factor improvement methods
Demonstrate the relationship between distributed generation and power quality.
Explain the power quality monitoring concepts and the usage of measuring instruments.

CO Statement – UEE
Identify a suitable motor for electric drives and industrial applications
Explain heating or welding techniques for suitable applications
understand various level of luminosity produced by different illuminating sources.
Estimate the illumination levels produced by various sources and recommend the most efficient illuminating sources and should be able to design different lighting systems by taking inputs and constraints in view.
Analyse the speed/time characteristics of different types of traction motors.

CO Statement – ELECTRICAL SIMULATION LABORATORY
Explain simulation of integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.
Analyze of three phase circuit representing the generator transmission line and load.
Analyze Simulation of single–phase full converter using different loads,single phase AC voltage controller using RL loads
Demonstrate simulation of integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.
Apply the knowledge of simulating transmission line by incorporating line, load and transformer models

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BHIMAVARAM-534 202.

CO Statement – POWER SYSTEM & SIMULATIONLABORATORY
Explain Sequence impedances of 3 phase Transformer
Determine the parameters of various power system components
Analyze various types of transmission line parameter to design transmission line and understand the sending end and receiving end circle diagram
Acquire knowledge of filtration and Treatment of transformer oil test and Apply techniques to evaluate dielectric strength of transformer oil, capacitance and dielectric loss of an insulating material.
Analyze the Load flow analysis for a given system (for 3 to 6 bus) using Newton Raphson and Gauss-seidel method method
Identify the conditions causing the system overloading, perform overload security analysis, obtain results for a given problem using MATLAB, and perform the transient stability analysis of a given network using MATLAB Software.

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DNR COLLEGE OF ENGINEERING & TECHNOLOGY, Bhimavaram

Course outcomes

Program Name:	B.TECH-ELECTRICALAND ELECTRONICS ENGINEERING	**Academic Year**	2020-21
Regulation	R16	**Class / Sem**	III/II

Rating Scale: 3-Excellent, 2-Saticsfactory, 1-Poor

CO Statement – POWER ELECTRONICS CONTROLLER AND DRIVES
Illustrate various braking methods of Electric Drive
Develop the output voltage and speed -torque expression for single phase half and fully controlled converter
Explain various quadrant operations of self and separately excited DC motor
Discuss Variable voltage Variable Frequency control of induction motor by PWM
Elaborate various rotor side control schemes of induction motor
Demonstrate the operation of self-controlled synchronous motors by VSI

CO Statement – POWER SYSTEM ANALYSIS
Understand the concepts of circuit topology.
Analyze the load flow methods.
Evaluate the concept of zbus algorithm.
Evaluate the symmetrical fault analysis.
Understand the symmetrical components and fault analysis.
Applying the performance of power system stability analysis.

CO Statement – MICROPROCESSOR AND MICRO CONTROLLER
Understands the internal architecture, capability in general and explore the evaluation and organization of 8086, 8051 and PIC Microcontrollers.
Interpret the microprocessor instruction set and addressing modes for writing an Assembly Language Program, estimating the machine cycles
Develop assembly language programming to design microprocessor based systems using interfacing techniques of 8086.
Interpret the microcontroller instruction set and addressing modes for writing an Assembly Language Program, estimating the machine cycles
Develop assembly language programming to design micro controller based systems using interfacing techniques of 8051
Develop cyber physical systems programs in C using PIC 18 micro controller

CO Statement – DATA STRUCTURE
Illustrate the properties, interfaces and behaviors of basic abstract data type.
Analyze different Sorting, Searching techniques and understand various file organizations.
Explain the basic data structures such as Arrays and Linked Lists.
Analyze Use of Stacks and Queues in programming
Describe different methods for traversing trees.
Solve the problem involving Graphs

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CO Statement – UNIX AND SHELL PROGRAMMING
Describe the architecture and features of UNIX Operating System and distinguish it from other Operating System.
Demonstrate UNIX commands for file handling and process control.
Determine Shell parameter and I/O redirections.
Analyse grep family and awk patterns.
Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem
Develop Parent and Child Process Communication Mechanism

CO Statement – POWER ELECTRONICS LAB
Analyze the characteristics of various power electronic devices
Describe the performance of single–phase and three–phase full–wave bridge converters with both resistive and inductive loads.
Understand the operation of single phase AC voltage regulator with resistive and inductive loads
Explain the working of Buck converter, Boost converter, single–phase square wave inverter and PWM inverter
Construct Boost converter in Continuous Conduction Mode operation.
Construct single phase AC Voltage regulator.

CO Statement – MICRO MPROCESSORS AND MICRO CONTROLLERS LAB
Understand the fundamentals of assembly level programming of microprocessors & microcontrollers
Apply the programming knowledge for arithmetic and logical operations in 8086 & 8051
Develop the programs for sorting
Develop the programs for string manipulation programs
Contrast how different I/O devices can be interfaced to processor and will explore several techniques of interfacing
Apply the programming knowledge for understanding of communication standards in 8086, 8051 & PIC18

CO Statement – DATASTRUCTURES THROUGH C LAB
Explain different Sorting and Searching Algorithms
Describe various types of linked lists and their applications
Use of stack, Queue and their applications
Classify simple applications using various data structures
Show the basic operations on trees
Determine minimum spanning tree by using Graphs

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CO Statement – Professional Ethics & Human Values
Recollect the human, moral values and ethics.
Illustrate the principles to being harmony among I, we and nature by focusing on human duties, rights, and dignity.
Describe the various Engineering Ethics and social issues that are encountered by every professional in discharging professional duties.
Describe the Engineers' Responsibilities towards Safety and Risk and based on this make analysis on designing to keep safety measure.
Demonstrate the professional ethics and techniques for collegiality and problem solving?
Discuss the globalization and MNC issues like – cross culture , business ethics and research ethics etc.

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BHIMAVARAM-534 202.

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DNR COLLEGE OF ENGINEERING & TECHNOLOGY, Bhimavaram.

Course outcomes

Program Name:	B.TECH-ELECTRICALAND ELECTRONICS ENGINEERING	**Academic Year**	2020-21
Regulation	R16	**Class / Sem**	III/I

CO Statement – POWER SYSTEMS-II
Understand the concepts of transmission line parameters .
Analyze the performance of transmission line analysis.
To study the performance of long transmission lines.
Evaluate the effect of travelling waves on transmission lines.
Understand the Performance of Factors governing in Transmission line.
Applying the performance of overhead insulators with sag and tension computation of transmission lines.
CO Statement – RENEWABLE ENERGY SOURCES AND SYSTEMS
Analyze solar radiation data, extraterrestrial radiation, and radiation on earth's surface
Design solar thermal collectors, solar thermal plants.
Design solar photo voltaic systems.
Develop maximum power point techniques in solar PV and wind energy systems.
Explain wind energy conversion systems, wind generators, power generation
Explain basic principle and working of hydro, tidal, biomass, fuel cell and geothermal systems.

CO Statement – SIGNALS AND SYSTEMS
Illustrate the signals and systems and principles of vector spaces, Concept of orthgonality.
Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.
Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
Understand the relationships among the various representations of LTI systems
Explain the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships.
Apply z-transform to analyze discrete-time signals and systems.

CO Statement – PULSE AND DIGITAL CIRCUITS
Analyze the output characteristics of linear circuits for different test signals.
Develop nonlinear circuits like clippers and clampers using active and passive elements.
Examine the switching characteristics of nonlinear elements used in various digital circuits.
Design various multivibrator circuits.
Illustrate the operation of various time base generator circuits and sampling gates.
Understand the operation of various digital logic circuits.

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CO Statement – POWER ELECTRONICS
Illustrate the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR's.
Design firing circuits for SCR.
Analyse the operation of single phase full–wave converters and analyze harmonics in the input current.
Demonstratethe operation of three phase full–wave converters.
Analyze the operation of different types of DC-DC converters
Explain the operation of inverters and application of PWM techniques for voltage control and harmonic mitigation. analyze the operation of AC-AC regulators

CO Statement – ELECTRICAL MACHINES – II LABORATORY
Assess the performance of single phase and three phase induction motors
Control the speed of three phase induction motor.
Predetermine the regulation of three–phase alternator by various methods.
Find the Xd/ Xq ratio of alternator and asses the performance of three–phase synchronous motor
Determine the performance single phase AC series motor.
Determine the Regulation of Alternator by various methods.

CO Statement – CONTROL SYSTEMS LAB
Analyze the performance and working Magnetic amplifier, D.C and A.C. servo motors and synchronous motors.
Design P, PI, PD and PID controllers
Design lag, lead and lag–lead compensators.
Determine the temperature control using PID controller
Determine the transfer function of D.C.motor.

CO Statement – ELECTRICAL MEASUREMENTS LABORATORY
Measure the electrical parameters voltage, current, power, energy
Know the Characteristics of resistance, inductance and capacitance.
Design and construct suitable bridge to measure inductance, capacitance & resistance.
Calibrate the energy meter and current transformer
Determine power, power factor of the circuit and iron losses.

CO Statement – Ipr & Patents
Differentiate and explain various forms of IPRs
Identify criteria's to fit one's own intellectual work in particular form of IPRs
Apply statutory provisions to protect particular form of IPRs
Analyse rights and responsibilities of holder of patent, copyright, trademark, industrial design etc
Determine procedure to protect different forms of IPRs national and international level
Develop skill of making search using modern tools and techniques.

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Course outcomes

Program Name:	B.TECH-ELECTRICALAND ELECTRONICS ENGINEERING	**Academic Year**	2020-21
Regulation	R19	**Class / Sem**	II/II

CO Statement–ELECTRICAL MEASUREMENTS &INSTRUMENTATION
Classify different Analog meters with their advantages and disadvantages.
Explain the principle of Electrodynamometer type wattmeter and power factor meters.
Analyse the principle of operation and working of various types of DC Bridges.
Analyse the principle of operation and working of various types of AC Bridges.
Identify different types of transducers and make appropriate selection for application.
Summarize the working principles of various digital meters.

CO Statement – ELECTRICAL MACHINES -II
Operate and performance of three phase induction motor.
Analyze speed torque characteristics and control the speed of induction motors.
Constructional features and problem of starting of single phase induction motor.
Design the armature winding and determine the regulation of synchronous generators.
Analyze the two reaction of salient pole machines and phasor diagram
Analyze the effects of excitation and mechanical input on the operation of synchronous motor

CO Statement – DIGITAL ELECTRONICS
Describe the different number systems and generate in various codes
Utilize the Boolean algebra in minimization of switching functions
Classify the different types of combinational logic circuits.
Analyse the Registers and counters using the knowledge of flip-flops .
Design methodology for sequential circuits
Design methodology for synchronous state machines.

CO Statement – CONTROL SYSTEMS
Ability to derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs
Capability to determine time response specifications of second order systems and to determine error constants
Acquires the skill to analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method.
Capable to analyze the stability of LTI systems using frequency response methods.
Able to design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams.
Ability to represent physical systems as state models and determine the response. Understanding the concepts of controllability and Observability

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CO Statement – POWERSYSTEMS-1
Understand the principle of operation of different components of a thermal power stations.
Understand the principle of operation of different components of a Nuclear power stations.
To study the constructional and operation of different components of an Air insulated sub stations.
To study the construction of Gas Insulated substations.
Understand the construction of underground cables.
Evaluating the economic aspects of power generation and tariffs.

CO Statement – SIGNALS AND SYSTEMS
Illustrate the signals and systems and principles of vector spaces, Concept of orthgonality.
Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.
Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
Understand the relationships among the various representations of LTI systems
Explain the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships.
Apply z-transform to analyze discrete-time signals and systems.

CO Statement – ELECTRICAL MACHINES – I LABORATORY
Determine and predetermine the performance of DC machines and Transformers.
Determine and predetermine the performance of Transformers.
Control the speed of DC motor by using various methods.
Obtain three phase to two phase transformation.
Determine constant losses of of DC Machine.
Separate core losses of Transformer.

CO Statement – ELECTRONIC DEVICES & CIRCUITS LABORATORY
Find and analyze an ethical issue in the subject matter under investigation or in a relevant field
Solve the multiple ethical interests at stake in a real-world situation or practice
Analyze what makes a particular course of action ethically defensible
solve their own ethical values and the social context of problems
Apply ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects
Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work

CO Statement – Professional Ethics And Human Values
Recollect the human, moral values and ethics.
Illustrate the principles to being harmony among I, we and nature by focusing on human duties, rights, and dignity.
Describe the various Engineering Ethics and social issues that are encountered by every professional in discharging professional duties.
Describe the Engineers' Responsibilities towards Safety and Risk and based on this make analysis on designing to keep safety measure.
Demonstrate the professional ethics and techniques for collegiality and problem solving?
Discuss the globalization and MNC issues like – cross culture , business ethics and research ethics etc.

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Course outcomes

Program Name:	B.TECH-ELECTRICALAND ELECTRONICS ENGINEERING	**Academic Year**	2020-21
Regulation	R19	**Class / Sem**	II/I

CO Statement – MANAGIRAL ECONOMICS AND FINANCIAL ANALYSIS
Estimating the Demand and demand elasticities for a product
Explain the Input -Output-Cost relationships and estimation of the least cost combination of inputs
Understand the nature of different markets and determine price output determination under various market conditions
Explain different Business Units, market structures, pricing strategies
Formulate Financial Statements and the Usage of various accounting tools for Analysis

CO Statement – THERMAL&HYDRALICS PRIME MOVERS
Explain the working of IC engines and their efficiencies.
Describe the working and analyze the performance of both impulse and reaction turbines
Describe the working of gas turbines with their performance
Describe the concept of hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes
Learn the constructional features, operationaldetails of various types of hydraulic turbines
Demonstrate various areas of types ofhydroelectric power plants

CO Statement – ELECTRICAL CIRCUITS ANALYSIS-II
Understand the concepts of balanced and unbalanced three-phase circuits.
Know the transient behavior of electrical networks with DC excitations
Learn the transient behavior of electrical networks with AC excitations.
Estimate various parameters of a two port network
Understand the electrical equivalent network for a given network transfer function
Know the different harmonics components from the response of an electrical network.

CO Statement – BASIC ELECTRONICS DEVICES AND CIRCUITS
Recognize the transport phenomena of charge carriers in a semiconductor.
Analyze the different types of diodes, operation and its characteristics.
Apply different types of filters in AC to DC conversion.
Describe Bipolar Junction Transistors and Field Effect Transistors.
Analyze the different biasing techniques used in BJTs and FETs.

CO Statement – ELECTRICAL MACHINES-I
Explain the construction, principle of operation and performance of DC Machines
Calculate the Torque, EMF Equation, Armature reaction, commutation and characteristics of DC Machines.
Understand the torque production mechanism and control the speed of dc motors
Design starter to conduct the Testes DC Machines.
Analyze the performance of single phase transformers and determination of regulation, losses and efficiency of single phase transformers.
Define the different testes in single phase and three phase transformers

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CO Statement – ELECTRO MAGNETIC FIELDS
Determine electric fields and potentials using Guass's law or solving Laplace's or Passion's equations, for various electric charge distributions.
Design the capacitance and energy stored in dielectrics.
Evaluate the magnetic field intensity due to current, the application of Ampere's law and the Maxwell's second and third equations.
Evaluate magnetic forces and torque produced by currents in magnetic field
Illustrate self and mutual inductances and the energy stored in the magnetic field.
Calculate induced EMF; understand the concepts of displacement current and Poi ting vect

CO Statement – THERMAL&HYDRALICS PRIME MOVERS LAB
Determine the coefficient of discharge of flow measuring devices (orifice meter and Venturi meter)
Evaluate the losses in pipes
Determine the efficiency and plot the characteristic curves of different types of pumps and turbines
Identify various systems and subsystems of Diesel and petrol engines
Analyse the performance characteristics of internal combustion engines
Illustrate the operational performances of boilers

CO Statement – ELECTRICAL CIRCUITS LAB
Apply KCL, KVL and ohms law to Simple circuits
Apply the Network theorems to Simple and Complex circuits
Analyze the performance of two port networks using network parameters
Determine the Transient response of RL and RC circuits.
Know the frequency response of resonant and coupled circuits

CO Statement – Essence Of India Traditional Knowledge
Understand the basic knowledge of traditional knowledge to develop the physical and social changes on traditional knowledge system
Discuss different characteristics of Indigenous Knowledge (IK) to differentiate it with formal, western and traditional knowledge.
Describe the significance of traditional knowledge protection to communicate the traditional knowledge information.
Explain the acts related to schedule tribes, traditional forest dwellers, plants protection and farmers to inculcate the legal protection information
Evaluate the legal mechanism of traditional knowledge protection to show the difference between IPR and non-IPR system.
Examine the sustainability and development of environment for standardizing the food security and traditional knowledge of the country.

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PO Attainments

Program Name:	B.Tech. in Electrical & Electronics Engineering	AY	2020-21

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C211	2.2	2.2	2.1	2.1	2.1							
C212	2.1		2.1		2.1	2.1						
C213	1.9	1.9										
C214	2.3	2.3	2.3	2.3								
C215	2.0	2.0	2.0									
C216				1.8	1.8		1.9	1.8			1.8	1.8
C217	2.8	2.7	2.7	2.7	2.8						2.7	2.8
C218	2.9	2.9	2.9	2.9		2.9						2.9
C219						2.0	2.0	2.0	2.0		2.0	2.0
C221	2.2		2.2		2.1							2.9
C222	2.2	2.2	2.2	2.1							2.2	
C223	2.8	2.8	2.7	2.6								2.7
C224	2.8	2.8	2.9	2.9	2.9							2.9
C225	2.3	2.2	2.3			2.2						2.2
C226	2.3	2.3	2.3	2.3	2.2							2.2
C227	2.7	2.7	2.7	2.7	2.7							
C228	2.5	2.5	2.5	2.5							2.5	
C229	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0			2.0
C311	2.3	2.2	2.3	2.3								
C312	1.7	1.8	1.8	1.8		1.8						
C313	2.1	2.0	2.1	2.0							2.0	
C314	1.8	1.7	1.8	1.8							1.8	1.8
C315	1.7	1.7	1.7									1.8
C316	2.8	2.8	2.8	2.8	2.8							
C317	2.8	2.8	2.8	2.8		2.8					2.8	2.8
C318	2.8	2.8	2.8	2.8		2.8						2.8
C319						2.0		2.0				2.0
C321	2.2	2.2	2.2	2.2							2.2	2.2
C322	2.3	2.3	2.2	2.3	2.3	2.3						
C323	2.3	2.2	2.2			2.2					2.3	2.3
C324	2.4	2.5	2.5	2.5		2.5						
C325	2.5	2.5	2.5	2.4								
C326	2.7	2.7	2.7	2.7	2.7							
C327	2.8	2.8			2.9				2.9			
C328	2.3	2.3							2.3			
C329	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0			2.0

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C411	2.1	2.1	2.1	2.1								2.1
C412	2.5	2.5	2.5	2.5								
C413	2.5	2.5	2.5	2.5								
C414	2.1	2.1	2.1	2.1								
C415	2.2	2.2	2.2		2.2						2.2	
C416	2.9	2.9	2.9	2.9		2.9						
C417	2.8	2.8	2.8	2.8	2.8						2.8	2.8
C418	2.8	2.8			2.9				2.8			
C421	2.9	2.9	2.9	2.9	2.9							
C422	2.9	2.9	2.9	2.9	2.9						2.9	
C423	2.8	2.9	2.8	2.9	2.8							2.8
C424	2.8	2.8	2.9	2.9	2.9							
C425						2	2	2	2	2	2	2
C426	1.1	1.3	1.2	0.7	1.1	1.3	1.6	1.4	1.5	1.6	0.8	1.1

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PSO Attainments

Program Name:	B.Tech. in Electrical & Electronics Engineering	AY	2020-21

Course	PSO1	PSO2
C211	2.1	2.2
C212	2.1	2.1
C213	1.7	1.7
C214	2.3	2.3
C215	2.0	2.0
C216	1.8	1.8
C217	2.7	2.8
C218	2.4	2.4
C219	-	-
C221	2.2	2.2
C222	2.2	2.3
C223	2.8	2.8
C224	2.7	2.8
C225	2.2	2.2
C226	2.3	2.2
C227	2.7	2.7
C228	2.5	2.5
C229	-	-
C311	2.2	2.2
C312	1.8	1.8
C313	2.0	2.0
C314	1.8	1.8
C315	1.7	1.7
C316	2.8	2.8
C317	2.3	2.3
C318	2.3	2.3
C319	-	-
C321	2.2	2.2
C322	2.3	2.2
C323	2.3	2.3
C324	2.5	2.5
C325	2.5	2.5
C326	2.7	2.7
C327	2.8	2.8
C328	2.3	2.2
C329	-	-
C411		
C412	2.1	2.1
C413	2.5	2.5

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C414	2.1	2.1
C415	2.2	2.2
C416	2.9	2.9
C417	2.3	2.2
C418	2.8	2.8
C421	2.9	2.9
C422	2.9	2.8
C423	2.8	2.8
C424	2.9	2.8
C425	2	2
C426	1.6	1.6

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CO FEEDBACKS(Indirect Attainment)

Program Name:	B.Tech. in Electronics & Communication Engineering					
II-I						
Course Name ↓	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Rating	**Level**	**Level**	**Level**	**Level**	**Level**	**Level**
MEFA	2.8	2.5	2.8	2.1	2.4	2.2
T&HP	2.7	2.2	2.7	2.5	2.7	2.1
ECA-II	2.3	2.5	2.6	2.4	2.6	2.2
BEDC	2.4	2.4	2.6	2.5	2.5	2.3
EM-I	2.6	2.4	2.3	2.9	2.8	1.4
EMF	2.4	2.7	2.4	2.6	2.9	2.1
T&HP LAB	2.7	2.5	2.5	2.7	2.4	2.5
ECLAB	2.6	2.7	2.8	2.6	2.8	2.5
EI&TK	2.10	2.40	2.20	2.30	2.40	2.20
II-II						
EM&I	2.6	2.6	2.4	2.4	2.5	2.3
EM-II	2.4	2.3	2.9	2.5	2.7	2.5
DE	2.4	2.6	2.7	2.7	2.2	2.4
CS	2.5	2.1	2.6	2.2	2.4	2.6
PS-I	2.9	2.6	2.5	2.6	2.7	2.8
S&S	2.3	2.4	2.7	2.6	2.6	2.4
EM-1 LAB	2.5	2.6	2.8	2.4	2.5	2.6
EDC LAB	2.4	2.5	2.8	2.8	2.7	2.3
PE&HV	2.3	2.6	2.7	2.8	2.4	2.5
III-I						
PS-II	2.36	2	2.18	1.63	1.72	1.81
RESS	2.09	1.72	2.36	2.09	1.63	1.54
S&S	2	1.72	1.72	2.54	1.81	1.45
PDC	1.81	181	2.09	1.45	2	2
PE	2.18	1.9	1.81	1.63	2.18	1.45
EM-II LAB	2.45	2	2.18	1.9	2	2
CS LAB	2	1.9	1.9	1.54	1.9	1.54
EM LAB	2.63	1.81	1.9	2	2	2
IPR&PATENTS	2.55	2.18	2.18	2.09	2.45	2.27

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III-II						
PECD	2.18	2.36	2.18	2	2.45	2
PSA	1.81	2.18	2.54	2.36	1.63	2.36
MP&MC	2.09	1.81	2.18	2.09	2.36	1.9
DS	2	2.27	1.81	2.45	1.9	2
UNIX	1.9	2.45	2.09	2.18	1.72	1.81
PELAB	1.81	2	2.09	1.31	2	2
MPMC LAB	2.27	2	1.72	1.9	2	2.27
DS LAB	2.27	2	2.09	2	2	2
PE&HV	2.45	2.27	2.09	2.55	2.55	2.36
IV-I						
LICA	2.48	2.51	2.14	2.54	2.2	2.22
PSOC	2.42	2.37	2.6	2.4	2.28	2.28
SGP	2.48	2.17	2.31	2.4	2.22	2.45
INST	2.42	2.4	2.42	2.54	2.25	2.24
EPQ	2.4	2.4	2.34	2.45	2.25	2.74
UEE	2.6	2.4	2.37	2.14	2.42	2.37
E-SIM LAB	2.22	2.4	2.14	2.25	2.4	2.54
PS-SIM LAB	2.54	2.54	2.48	2.02	2.31	2.4
IV-II						
DCS	2.59	2.68	2.71	2.4	2.31	2.5
HVDC	2.62	2.75	2.56	2.34	2.46	2.34
EDS	2.56	2.56	2.62	2.65	2.34	2.56
HVE	2.5	2.71	2.71	2.46	2.4	2.53
SEMINAR	2.7	2.64	2.59	2.55	2.51	2.57
PROJECT	2.61	2.55	2.62	2.6	2.44	2.54
	CO7	**CO8**	**CO9**	**CO10**	**CO11**	**CO12**
	Level	**Level**	**Level**	**Level**	**Level**	**Level**
	2.62	2.55	2.54	2.62	2.44	2.44

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Direct Attainment

II-I

Course Name	CO1			CO2			CO3			CO4			CO5			CO6		
	M	S	Total	M	S	Total	M	S	Total	M	S	Total	M	S	Total	M	S	Total
MEFA	1.66	1	1.46	2	1	1.93	2.3	1	1.93	2	1	1.70	2	1	1.70	2	1	1.70
T&HP	2	2	2.00	2	2	2.00	2	2	2.00	1.33	2	1.53	1.3	2	1.53	2.3	2	2.23
ECA-II	3	3	3.00	1	3	1.60	2	3	2.30	2	3	2.30	1	3	1.60	2	3	2.30
BEDC	1.67	2	1.77	1	2	1.30	1	2	1.30	3	2	2.70	3	2	2.70			
EM-I	2.33	2	2.23	2	2	1.77	1.7	2	1.77	2.33	2	2.23	2.3	2	2.23	2.3	2	2.23
EMF	2.33	1	1.93	3	1	2.40	3	1	2.40	3	1	2.40	3	1	2.40	2.7	1	2.16
T&HP LAB	2.75	3	2.83	3	3	2.88	2.8	3	2.88	2.5	3	2.65	2.8	3	2.83	2.5	3	2.65
ECLAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00			
EI&TK	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
II-II																		
EM&I	2.67	1	2.17	2	1	1.93	2.3	1	1.93	3	1	2.40	2.7	1	2.17	2.3	1	1.93
EM-II	1	2	1.30	3	2	2.70	3	2	2.70	3	2	2.70	1	2	1.30	2	2	2.00
DE	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	2	3	2.30
CS	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	2	3	2.30
PS-I	3	2.6	2.88	3	2	2.42	2.3	2	2.21	3	2	2.70	2.6	2	2.42	2.6	2	2.42
S&S	3	2	2.70	3	2	2.46	2.7	2	2.46	2.66	2	2.46	3	2	2.70	3	2	2.70
EM-1 LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
EDC LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	2.7	3	2.77
PE&HV	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
III-I																		

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PS-II	2.33	2	2.23	2	2	2.23	1.7	2	1.76	2.33	2	2.23	2.3	2	2.23	1.7	2	1.76
RESS	3	2	2.70	3	2	2.70	3	2	2.70	3	2	2.70	1.6	2	1.72	2.6	2	2.42
S&S	1.66	1	1.46	2	1	1.93	2	1	1.70	2.33	1	1.93	2.3	1	1.93	1.7	1	1.46
PDC	1.67	1	1.47	2	1	1.93	1.7	1	1.47	2.33	1	1.93	1.7	1	1.47	2.3	1	1.93
PE	2.6	1	2.12	3	1	2.12	2.6	1	2.12	2	1	1.70	1.5	1	1.35	1.6	1	1.42
EM-II LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
CS LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
EM LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
IPR&PATENTS	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
III-II																		
PECD	3	2	2.70	3	2	2.70	3	2	2.70	3	2	2.70	3	2	2.70	2.6	2	2.42
PSA	2.6	2	2.42	3	2	2.46	2	2	2.00	2.3	2	2.21	2.6	2	2.42	2.3	2	2.21
MP&MC	2.66	1	2.16	2	1	1.93	2.3	1	1.93	2.33	1	1.93	2.7	1	2.16	2.7	1	2.16
DS	3	3	3.00	2	3	2.30	2	3	2.30	3	3	3.00	3	3	3.00	2	3	2.30
UNIX	3	3	3.00	2	3	2.30	2	3	2.30	2	3	2.30	2	3	2.30	3	3	3.00
PELAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
MPMC LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
DS LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
PE&HV	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00

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BHIMAVARAM-534 202.

IV-I																		
LICA	2.5	1	2.05	3	1	2.05	2.3	1	1.88	2.5	1	2.05	2.5	1	2.05	2.5	1	2.05
PSOC	2.3	3	2.51	2	3	2.30	2	3	2.30	2.66	3	2.76	2.7	3	2.76	2.7	3	2.76
SGP	2.33	2	2.23	2	2	2.23	2.3	2	2.23	2.33	2	2.23	2.3	2	2.23	2.3	2	2.23
INST	3	2	2.70	3	2	2.70	3	2	2.70	3	2	2.70	3	2	2.70	3	2	2.70
EPQ	2.33	3	2.53	2	3	2.30	2	3	2.30	2.33	3	2.53	2.3	3	2.53	2.3	3	2.53
UEE	2	3	2.30	2	3	2.30	1	3	1.60	2	3	2.30	1	3	1.60	2	3	2.30
E-SIM LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
PS-SIM LAB	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
IV-II																		
DCS	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
HVDC	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	2.7	3	2.77
EDS	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	2	3	2.30
HVE	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
SEMINAR	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
PROJECT	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3.00
	CO7			CO8			CO9			CO10			CO11			CO12		
	3	3	3.00	3	3	3.00	3	3	3.00	3	3	3	3	3	3	3	3	3

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Overall Attainment

II-I

Course Name	CO1			CO2			CO3			CO4			CO5			CO6		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
MEFA	1.46	2.8	1.72	1.93	2.5	1.76	1.93	2.8	2.10	1.7	2.1	1.78	1.7	2.4	1.84	1.7	2.2	1.80
T&HP	2	2.7	2.14	2	2.2	2.04	2	2.7	2.14	1.53	2.5	1.72	1.53	2.7	1.76	2.23	2.1	2.20
ECA-II	3	2.30	2.86	1.6	2.5	1.78	2.3	2.6	2.33	2.3	2.4	2.32	1.6	2.6	1.78	2.3	22	2.34
BEDC	1.77	2.6	1.94	1.3	2.4	1.52	1.3	2.3	1.50	2.7	2.9	2.74	2.7	2.8	2.72	-	-	
EM-I	2.23	2.6	2.30	1.76	2.4	1.90	1.76	2.3	1.87	2.23	2.9	2.36	2.23	2.8	2.34	2.23	1.4	2.06
EMF	1.93	2.4	2.02	2.4	2.7	2.46	2.4	2.4	2.40	2.4	2.6	2.44	21.4	2.9	2.50	2.16	2.7	2.26
T&HP LAB	2.83	2.7	2.80	2.88	2.5	2.80	2.88	2.5	2.80	2.65	2.7	2.66	2.83	2.4	2.74	2.65	2.5	2.62
ECLAB	3	2.6	2.92	3	2.7	2.94	3	2.8	2.93	3	2.6	2.92	3	2.8	2.93			
EI&TK	3	2.1	2.82	3	2.4	2.88	3	2.2	2.84	3	2.3	2.86	3	2.4	2.88	3	2.2	2.84

II-II

EM&I	2.17	2.6	2.25	1.93	2.6	2.06	1.93	2.4	2.02	2.4	2.4	2.40	2.17	2.5	2.23	1.93	2.3	2.00
EM-II	1.3	2.4	1.52	2.7	2.3	2.62	2.7	2.9	2.74	2.7	2.5	2.66	1.3	2.7	1.58	2	2.5	2.10
DE	3	2.4	2.80	3	2.6	2.92	3	2.7	2.94	3	2.7	2.94	3	2.2	2.84	2.3	2.4	2.32
CS	3	2.5	2.90	3	2.1	2.82	3	2.6	2.92	3	2.2	2.84	3	2.4	2.88	2.3	2.6	2.32
PS-I	2.7	2.18	2.32	2.7	2.36	2.36	2.7	2.18	2.32	2.7	2	2.29	1.72	2.45	1.86	2.14	2	2.33
S&S	2.7	2.3	2.46	2.49	2.4	2.25	2.49	2.7	2.25	2.49	2.6	2.25	2.7	2.6	2.07	2.7	2.4	2.23
EM-I LAB	3	2.5	2.80	3	2.6	2.70	3	2.8	2.70	3	2.4	2.70	3	2.5	2.80	3	2.6	2.70
EDC LAB	2.72	2.74	2.72	2.3	2.59	2.36	2.3	2.73	2.39	2.3	2.55	2.35	2.3	2.71	2.38	2.77	2.7	2.76
PE&HV	3	2.3	2.86	3	2.6	2.92	3	2.7	2.94	3	2.8	2.96	3	2.4	2.88	3	2.5	2.8

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III-I

PS-II	2.231	2.36	2.25	2.23	2	2.18	1.76	2.18	1.84	2.23	1.63	2.11	2.23	1.72	2.12	1.76	1.8	1.77
RESS	2.7	2.18	2.32	2.7	2.36	2.36	2.7	2.18	2.32	2.7	2	2.29	1.72	2.45	1.86	2.42	2	2.33
S&S	1.46	2	1.56	1.93	1.72	1.88	1.7	1.72	1.70	1.93	2.54	2.05	1.93	1.81	1.90	1.46	1.5	1.45
PDC	1.46	1.81	1.53	1.93	1.81	1.90	1.46	2.09	1.58	1.93	1.45	1.83	1.46	2	1.56	1.93	2	1.94
PE	2.12	2.18	2.13	2.12	1.9	2.00	2.12	1.81	2.00	1.7	1.63	1.60	1.35	2.18	1.50	1.42	1.5	1.40
EM-II LAB	3	2.45	2.89	3	2	2.80	3	2.18	2.83	3	1.9	2.78	3	2	2.80	3	2	2.80
CS LAB	3	2	2.80	3	1.9	2.78	3	1.9	2.78	3	1.54	2.70	3	1.9				
EM LAB	3	2.63	2.92	3	1.81	2.76	3	1.9	2.78	3	2	2.80	3	2	2.80			
IPR&PATENTS	3	2.55	2.91	3	2.18	2.84	3	2.18	2.84	3	2.09	2.82	3	2.45	2.89	3	2.3	2.85

III-II

PECD	2.7	2.18	2.32	2.7	2.36	2.36	2.7	2.18	2.32	2.7	2	2.29	2.7	2.45	1.89	2.4	2	2.08
PSA	2.42	1.81	2.29	2.46	2.18	2.40	2	2.54	2.10	2.21	2.36	2.24	2.42	1.63	2.26	2.21	2.4	2.24
MP&MC	2.16	2.09	2.46	1.9	1.81	2.25	1.93	2.18	2.25	1.93	2.09	2.25	2.16	2.36	2.07	2.16	1.9	2.23
DS	3	2.36	2.80	2.3	2.45	2.33	2.3	2.18	2.06	3	2	2.80	3	2.15	2.80	2.3	2	2.24
UNIX	3	2.18	2.83	2.3	2.34	2.30	2.3	2.18	2.27	2.3	2	2.24	2.3	2.2	2.40	3	2.3	2.86
PELAB	3	1.81	2.80	3	2	2.70	3	2.09	2.70	3	1.31	2.70	3	2	2.80	3	2	2.70
MPMC LAB	3	2.27	2.90	3	2	2.62	3	1.72	2.89	3	1.9	2.80	3	2	2.86	3	2.3	2.88
DS LAB	3	2.27	2.80	3	2	2.70	3	2.09	2.80	3	2	2.80	3	2	2.88	3	2	2.66
PE&HV	3	2.45	2.89	3.00	2.27	2.85	3	2.09	2.82	3	2.55	2.91	3.00	2.55	2.91	3.00	2.36	2.87

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IV-I

LICA	2.05	2.48	2.11	2.05	2.51	2.08	1.8	2.14	1.90	2.05	2.54	2.11	2.05	2.2	2.12	2.05	2.2	2.11
PSOC	2.51	2.42	2.49	2.3	2.37	2.31	2.3	2.6	2.36	2.76	2.4	2.68	2.76	2.28	2.66	2.76	2.3	2.66
SGP	2.231	2.48	2.28	2.23	2.17	2.22	2.231	2.31	2.24	2.231	2.4	2.26	2.23	2.2	2.20	2.2	2.5	2.27
INST	2.7	2.42	2.64	2.7	2.4	2.64	2.7	2.42	2.64	2.7	2.54	2.67	2.7	2.25	2.61	2.7	2.2	2.61
EPQ	3	2.53	2.90	3	2.3	2.86	3	2.3	2.86	3	2.53	2.90	3	2.53	2.86	3	2.5	2.90
UEE	2.3	2.6	2.36	2.3	2.4	2.32	1.6	2.37	1.75	2.3	2.14	2.26	1.6	2.42	2.76	2.3	2.4	2.31
E-SIM LAB	3	2.22	2.80	3	2.4	2.80	3	2.14	2.80	3	2.25	2.80	3	2.4	2.80			
PS-SIM LAB	3	2.54	2.90	2.65	2.54	2.62	3	2.48	2.89	3	20.2	2.80	3	2.31	2.86	3	2.4	2.88

IV-II

DCS	3	2.59	2.91	3	2.68	2.93	3	2.71	2.94	3	2.4	2.88	3	2.31	2.86	3	2.5	2.90
HVDC	3	2.62	2.92	3	2.75	2.95	3	2.56	2.91	3	2.34	2.86	3	2.46	2.83	2.76	2.3	2.68
EDS	3	2.56	2.91	3	2.56	2.91	3	2.62	2.92	3	2.65	2.93	3	2.34	2.87	2.3	2.6	2.35
HVE	3	2.5	2.91	3	2.71	2.91	3	2.71	2.92	3	2.46	2.93	3	2.4	2.87	3	2.5	2.35
SEMINAR	3	2.7	2.94	3	2.64	2.93	3	2.59		3	2.55	2.91	3	2.51	2.90	3	2.6	2.91
PROJECT	3	2.61	2.92	3	2.55	2.91	3	2.62	2.92	3	2.66	2.93	3	2.44	2.89	3	2.5	2.91
	CO7			CO8			CO9			CO10			CO11			CO12		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
	3	2.62	2.924	3	2.55	2.91	3	2.54	2.908	3	2.62	2.924	3	2.44	2.888	3	2.4	2.888

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CO attainment– Overall

Program Name:	B.Tech. in Electrical & Electronics Engineering	AY	2020-21

IV-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
DCS	2.91	2.93	2.94	2.88	2.86	2.9
HVDC	2.94	2.95	2.91	2.86	2.83	2.91
EDS	2.91	2.91	2.92	2.93	2.87	2.35
HVE	2.91	2.91	2.92	2.93	2.87	2.35
SEMINAR	2	2	2	2	2	2
PROJECT	2	2	2	2	2	2
	CO7	CO8	CO9	CO10	CO11	CO12
	2	2	2	2	2	2

IV-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
LICA	2.11	2.08	1.9	2.11	2.12	2.11
PSOC	2.42	2.31	2.36	2.69	2.66	2.66
SGP	2.28	2.21	2.24	2.26	2.22	2.27
INST	2.64	2.64	2.64	2.67	2.61	2.61
EPQ	2.9	2.86	2.86	2.9	2.86	2.9
UEE	2.36	2.32	1.75	2.26	2.76	2.31
E-SIM LAB	2.8	2.8	2.8	2.8	2.8	
PS-SIM LAB	2.9	2.62	2.89	2.8	2.86	2.88

III-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
PECD	2.32	2.36	2.32	2.29	1.89	2.08
PSA	2.3	2.4	2.1	2.24	2.26	2.24
MP&MC	2.46	2.25	2.25	2.25	2.07	2.23
DS	2.8	2.33	2.06	2.8	2.8	2.24
UNIX	2.83	2.3	2.27	2.24	2.4	2.86
PELAB	2.8	2.7	2.7	2.7	2.8	2.7
MPMC LAB	2.9	2.62	2.89	2.8	2.86	2.88
DS LAB	2.8	2.7	2.8	2.8	2.88	2.66
PE&HV	2.89	2.85	2.82	2.91	2.91	2.87

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BHIMAVARAM-534 202.

III-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
PS-II	2.25	1.18	1.84	2.11	2.12	1.77
RESS	2.32	2.36	2.32	2.29	1.86	2.33
S&S	2.56	1.88	1.7	2.05	1.9	1.45
PDC	1.53	1.91	1.58	1.83	1.56	
PE	2.13	2	2	1.6	1.5	1.4
EM-II LAB	2.89	2.8	2.83	2.78	2.8	2.8
CS LAB	2.8	2.78	2.78	2.7	2.8	
EM LAB	2.92	2.76	2.78	2.8	2.8	
IPR&PATENTS	2.91	2.84	2.84	2.82	2.89	2.85

II-II

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
EM&I	2.256	2.06	2.02	2.4	2.2	2.0
EM-II	1.52	2.62	2.74	2.66	1.58	2.1
DE	2.8	2.92	2.94	2.94	2.84	2.32
CS	2.9	2.82	2.92	2.84	2.88	2.32
PS-I	2.32	2.36	2.32	2.29	1.86	2.33
S&S	2.46	2.25	2.25	2.25	2.07	2.23
EM-1 LAB	2.8	2.7	2.7	2.7	2.8	2.7
EDC LAB	2.72	2.36	2.39	2.35	2.38	2.76
PE&HV	2.86	2.92	2.94	2.96	2.88	2.80

II-I

COURSE NAME	CO1	CO2	CO3	CO4	CO5	CO6
MEFA	1.72	1.76	2.1	1.78	1.84	1.8
T&HP	2.14	2.04	2.14	1.72	1.76	2.2
ECA-II	2.86	1.78	2.33	2.32	1.78	2.34
EDC	2.02	1.64	2.06	2.04	1.65	1.82
EM-I	2.3	1.9	1.87	2.36	2.24	2.06
EMF	2.02	2.46	2.4	2.44	2.5	2.26
T&HP LAB	2.8	2.8	2.8	2.66	2.74	2.62
ECLAB	2.92	2.94	2.93	2.92	2.93	
EI&TK	2.82	2.88	2.84	2.86	2.88	2.84

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