Course Outcome

Session 2019-20

Department of Electrical & Electronics Engineering

Index

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Electronics Engineering (KOE-038)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the concept of PN junction diodes along with its characteristics and breakdown mechanism	**2**
2	Understand and apply the concepts of conventional diode and Special purpose diode for different applications.	**2,3**
3	Understand and Analyze the I-V characteristics of BJT and FET.	**2,4**
4	Understand the Op-Amp, amplifiers, and its application as integrator, and differentiator.	**2**
5	Remember and understand the concept of Different measuring instruments like Voltmeters, multi-meters, digital storage oscilloscope and compare of DSO with analog oscilloscope	**1,2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	1	1	1	-	-	-	-	-	1	1	2	2
CO-2	2	2	2	2	1	-	-	-	-	-	1	1	2	3
CO-3	3	3	2	2	1	-	-	-	-	-	1	2	1	3
CO-4	3	3	3	3	1	-	-	-	-	1	2	2	3	3
CO-5	2	2	2	2	1	-	-	-	-	1	2	2	3	3
Target Level	**2.4**	**2.4**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**1**	**1.4**	**1.6**	**2.2**	**2.8**

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Technical Communication (KAS-301)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the basics, process, level and flow of communication without barrier and enhance interpersonal skills of students.	**2**
2	Learn and use principles of business communication and practice them in proper formats using appropriate structure in order to develop professional attitude among students.	**5,6**
3	Explore and imbibe various nuances and ethics of delivery in presentation along with audio-visual aids and also learn to effectively work as an individual as well as in team.	**3**
4	Appear in group discussion, interviews and various other activities at work place effectively with grammatical and socio-linguistic competence and appropriate verbal and non-verbal cues.	**2,5**
5	Understand and imbibe voice-dynamics appropriately	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1									3	3	2	2		
CO-2									2	3	2	3		
CO-3									2	3	2	3		
CO-4									2	3	2	3		
CO-5									3	3	2	3		
Target Level									**2.4**	**3**	**2**	**3**		

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Electromagnetic Field Theory (KEE-301)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the application of different coordinate systems, and analyze the properties of static electric field, different types of materials based on electric properties, and Maxwell's equations for static field.	**4**
2	Apply the concepts of static electric field to evaluate the parameters such as current, capacitance, potential, work done in static field.	**3**
3	Apply the concepts of static magnetic field to evaluate the parameters such as current, inductance, magnetic potential, work done in static field.	**3**
4	Analyze Maxwell's equations for static and time varying field.	**4**
5	Apply the concepts of time varying electric and magnetic field to evaluate the parameters of electromagnetic wave transmission and transmission line.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	2	3	1	1	1	-	-	-	-	2	2	2
CO-2	2	3	2	3	2	1	1	-	-	-	-	3	2	2
CO-3	2	3	3	3	3	2	1	-	-	-	-	3	2	3
CO-4	2	3	3	3	3	2	2	-	-	-	-	3	2	3
CO-5	2	2	2	2	1	3	2	-	-	-	-	2	2	1
Target Level	**2**	**2.6**	**2.4**	**2.8**	**2**	**1.8**	**1.4**	**-**	**-**	**-**	**-**	**2.6**	**2**	**2.2**

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Electrical Measurements & Instrumentation (KEE-302)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Evaluate errors in measurement as well as identify and analyze different types of instruments for the measurement of voltage, current, power and energy.	**5**
2	Understand the knowledge of measurement of electrical quantities resistance, inductance and capacitance with the help of bridges.	**2**
3	Demonstrate the working of instrument transformers as well as evaluate the errors in current and potential transformers.	**2**
4	Illustrate the working of electronic instruments like voltmeter, multi-meter, frequency meter and CRO.	**2**
5	Apply the knowledge of transducers, their classifications and their applications for the measurement of physical quantities like motion, force, pressure, temperature, flow and liquid level.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	2	2	3	1					1	3	3	3
CO-2	2	2	2	2	3	1					2	3	3	3
CO-3	2	2	2	2	3	1					2	3	3	3
CO-4	2	2	2	2	3	1					2	3	3	3
CO-5	2	2	2	2	3	1					2	3	3	3
Target Level	**2**	**2**	**2**	**2**	**3**	**1**					**1.80**	**3**	**3**	**3**

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Basic Signals & Systems (KEE-303)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Analyze various types of signals & systems and its mathematical processing .	**4**
2	Analyze the response of LTI system through Fourier series and Fourier transform and their applications to network analysis.	**4**
3	Analyze the properties of continuous time signals and system and its response using Laplace transform.	**4**
4	Analyze the concept of state-space models for SISO & MIMO system.	**4**
5	Apply the concepts of Z transform to solve complex engineering problems using difference equations.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	1									2	1	
CO-2	3	3	1									1	1	
CO-3	3	3	3									2	3	
CO-4	3	3	3	3								2	3	
CO-5	3	3	3	2								3	1	
Target Level	**3**	**3**	**2.2**	**2.5**								**2**	**1.8**	

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Analog Electronics Lab (KEE-351)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the characteristics and applications of the Semiconductor devices.	**2**
2	Draw the characteristics of BJT, FET and MOSFET.	**3**
3	Understand the parameters of Operational Amplifier and instrumentation Amplifier with their applications.	**2**
4	Understand the V-I characteristics of Power devices like SCR, TRIAC	**2**
5	Analyze various parameters of semiconductor devices.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	3							1	2	
CO-2	3	3	3	3	3							1	2	
CO-3	3	3	3	3	3							1	2	1
CO-4	3	3	3	3	3							1	2	1
CO-5	1	2	2	2	2							1	1	
Target Level	**2.6**	**2.8**	**2.8**	**2.8**	**2.8**							**1**	**1.8**	**1**

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Electrical Measurements and Instrumentation Lab (KEE-352)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the importance of calibration of measuring instruments.	**2**
2	Demonstrate the construction and working of different measuring instruments.	**3**
3	Apply the knowledge of AC and DC bridges in different measuring applications.	**3**
4	Determine electrical engineering parameters like voltage, current, power & phase difference in industry as well as in power generation, transmission and distribution sectors.	**3**
5	Analyze the variety of problems in the field of electrical measurements.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	3	2	-	-	2	2	2	3	3	3
CO-2	3	3	3	3	3	2	-	-	2	2	2	3	3	3
CO-3	3	3	3	3	2	2	-	-	2	2	2	3	3	3
CO-4	3	3	3	3	3	2	-	-	2	2	2	3	3	3
CO-5	3	3	3	3	3	2	-	-	2	2	2	3	3	3
Target Level	**3**	**3**	**3**	**3**	**2.8**	**2**	**-**	**-**	**2**	**2**	**2**	**3**	**3**	**3**

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Electrical Workshop (KEE-353)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand various types of electrical connections.	**2**
2	Analyze the difference between various electrical wires, cables and accessories.	**4**
3	Understand the layout of electrical substation & various safety measures.	**2**
4	Understand the construction, working and application of various workshop tools.	**2**
5	Develop small circuits on printed circuit boards.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	2						2	1	2	1	1
CO-2	3	3	3	2						2	2	2	2	2
CO-3	3	2	3	2						2	2	2	2	2
CO-4	3	2	2	2						2	2	2	2	2
CO-5	3	2	2	2						2	2	3	2	3
Target Level	**3**	**2.4**	**2.4**	**2**						**2**	**1.8**	**2.2**	**1.8**	**2**

Session: 2019-20 **Semester: 3rd**

Subject Name (Code): Mini Project or Internship Assessment (KEE-354)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the knowledge of the industry in which the internship is done	**2**
2	Apply the knowledge and skills learned in the classroom in a work setting.	**3**
3	Analyze the activities and functions of business professionals.	**4**
4	Understand the areas for future knowledge and skill development.	**2**
5	Analyze the career options while more clearly defining personal career goals.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	2	1				3	2	2	3	3
CO-2	3	3	3	3	3	1				3	2	2	3	3
CO-3	3	3	3	3	2	1				3	2	2	3	3
CO-4	3	3	3	3	2	1				3	2	2	3	3
CO-5	3	3	3	3	3	1				3	2	2	3	3
Target Level	**3.0**	**3.0**	**3.0**	**3.0**	**2.4**	**1**				**3.0**	**2.0**	**2.0**	**3.0**	**3.0**

Session: 2019-20 **Semester: 4th**

Subject Name (Code): Mathematics-IV (KAS-402)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Identify the application of partial differential equations and apply for solving Linear and non-linear partial differential equations	**4**
2	Understand the classification of second order partial differential equations and by using the method of separation of variables to evaluate the general solution of Heat, Wave, Laplace equations and Transmission lines.	**3**
3	Remember the concept of moments, skewness, kurtosis and moment generating function and analyze the linear and non linear regression.	**4**
4	Remember the concept of probability, random variable and apply for solving the problem related to discrete and continuous probability distribution	**4**
5	Understand the statistical method of data samples, hypothesis testing and applying the study of control chart and their properties.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	3	2	3	2	-	-	-			3	2
CO-2	3	3	3	3	2	3	1	-	-	-	1	3	3	3
CO-3	3	3	2	2	3	3	1	-	-	-	1	3	3	2
CO-4	3	3	3	2	3	3	2	-	-	-	2	3	3	2
CO-5	3	3	3	3	3	3	1	-	-	-	1	3	3	3
Target Level	**3**	**3**	**2.6**	**2.6**	**2.6**	**3**	**1.4**	**-**	**-**	**-**	**1.25**	**3**	**3**	**2.4**

Session: 2019-20 **Semester: 4th**

Subject Name (Code): Universal Human Value (KVE-401)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the essential complementarities between 'VALUES" and 'SKILLS' with its relation of engineering concept.	**2**
2	Analyze the sustained happiness and prosperity which are the core aspirations of all human beings keeping social environmental, economic, political scenario.	**4**
3	Apply the development of a Holistic perspective among students.	**3**
4	Apply the value based living in a natural way using technological advancement.	**3**
5	Analyze the plausible implications of such a Holistic approach in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with nature by using engineering, management principle.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1						3	3	3	3	3	3	3		
CO-2						3	3	3	3	3	3	3		
CO-3						3	3	3	3	3	3	3		
CO-4						3	3	3	3	3	3	3		
CO-5						3	3	3	3	3	3	3		
Target Level						**3**	**3**	**3**	**3**	**3**	**3**	**3**		

Session: 2019-20 **Semester: 4th**

Subject Name (Code): Digital Electronics (KEE-401)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Apply concepts of Digital Binary System and implementation of Gates.	**3**
2	Analyze and design of Combinational logic circuits.	**4**
3	Analyze and design of Sequential logic circuits with their applications.	**4**
4	Implement the Design procedure of Synchronous & Asynchronous Sequential Circuits.	**3**
5	Apply the concept of Digital Logic Families with circuit implementation.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	2	2	2	-	-	-	-	-	-	-	2	1
CO-2	3	3	3	3	3	-	-	-	-	-	1	-	2	1
CO-3	3	3	3	3	3	-	-	-	-	-	1	-	2	2
CO-4	3	3	3	3	3	-	-	-	-	-	1	1	2	2
CO-5	3	3	3	3	3	-	-	-	-	-	1	1	2	2
Target Level	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**2**	**1.6**

Session: 2019-20 **Semester: 4th**

Subject Name (Code): Electrical Machines-I (KEE-402)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Analyse the working of EMEC devices, singly and doubly excited systems.	**4**
2	Analyse the response of the dc machine on the basis of Armature Reaction and commutation.	**4**
3	Evaluate the performance of dc machine by performing Swinburne' and Hopkinson's test.	**5**
4	Evaluate the performance of single-phase transformer by performing open circuit test, short circuit test and Sumpner's test.	**5**
5	Understand the different types of 3 phase transformer connections & conversion of 3-phase to 2-phase.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	2	2	1	2					1		2	2	
CO-2	3	2	2	1	2					1		2	2	
CO-3	3	2	2	1	2					1		2	2	
CO-4	3	2	2	1	2					1		2	2	
CO-5	3	2	2	1	2					1		2	2	
Target Level	**3**	**2**	**2**	**1**	**2**					**1**		**2**	**2**	

Session: 2019-20 **Semester: 4th**

Subject Name (Code): Network Analysis & Synthesis (KEE-403)

S No.	Course Outcomes	
After completion of the course, the student will be able to		
1	Apply the knowledge of basic circuital law, nodal and mesh methods of circuit analysis and simplify the network using Graph Theory approach.	**3**
2	Analyze the AC and DC circuits using Kirchhoff's law and Network simplification theorems.	**4**
3	Analyze steady-state responses and transient response of DC and AC circuits using classical and Laplace transform methods.	**4**
4	Demonstrate the concept of complex frequency and analyze the structure and function of one and two port network.	**4**
5	Synthesize one port network and analyze different filters.	**6**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	2	2					2		2	2	2
CO-2	3	3	3	2	2					2		2	2	2
CO-3	3	3	3	2	2					2		2	2	2
CO-4	3	3	3	2	2					2		2	2	2
CO-5	3	3	3	2	2					2		2	3	3
Target Level	**3**	**3**	**3**	**2**	**2**					**2**		**2**	**2.20**	**2.20**

Session: 2019-20 **Semester: 4th**

Subject Name (Code): Circuit Simulation Lab (KEE-451)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Apply the knowledge of basic circuital law, nodal and mesh analysis for given circuit.	**3**
2	Analysis of the AC and DC circuits using simulation techniques.	**4**
3	Analysis of transient response of AC circuits.	**4**
4	Evaluate the two-port network parameters.	**5**
5	Evaluate the parameters of different filters.	**5**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	2	1	1	1						2	2	2
CO-2	3	3	2	2	1	1						3	3	2
CO-3	3	3	3	3	2	2						3	3	3
CO-4	3	3	3	3	2	2						3	3	3
CO-5	2	2	2	1	3	3						2	2	1
Target Level	**2.6**	**2.6**	**2.4**	**2**	**1.8**	**1.8**						**2.6**	**2.6**	**2.2**

Session: 2019-20 **Semester: 4th**

Subject Name (Code): Electrical Machine-I Lab (KEE-452)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Perform the speed control of dc motor above and below the rated speed.	**3**
2	Evaluate the efficiency of dc motor by conducting load test.	**5**
3	Evaluate the efficiency of transformer by performing load test.	**5**
4	Evaluate the parameters of equivalent circuit of transformer by conducting short circuit and open circuit test	**5**
5	Design transformer and dc machine parts using MATLAB	**6**
6	Perform the speed control of dc motor above and below the rated speed.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	2	2	1	2	-	-	-	-	1	-	2	2	-
CO-2	3	2	2	1	2	-	-	-	-	1	-	2	2	-
CO-3	3	2	2	1	2	-	-	-	-	1	-	2	2	-
CO-4	3	2	2	1	2	-	-	-	-	1	-	2	2	-
CO-5	3	2	2	1	2	-	-	-	-	1	-	2	2	-
Target Level	3	2	2	1	2	-	-	-	-	1	-	2	2	-

Session: 2019-20 **Semester: 4th**

Subject Name (Code): Digital Electronics Lab (KEE-453)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand Digital Binary System and apply it in implementation of Gates.	**2, 3**
2	Design the Sequential circuits with the help of Combinational circuits and feedback element.	**6**
3	Design data selector circuits with the help of universal Gates.	**6**
4	Design the counters with the help of sequential circuit and basic Gates.	**6**
5	Demonstrate the projects using the digital ICs and electronics components.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	2	2	2	-	-	2	3	2	2	3	3
CO-2	3	3	3	2	2	2	-	-	2	3	3	2	3	2
CO-3	3	3	3	2	2	2	-	-	2	2	3	3	2	1
CO-4	3	3	3	3	3	2	-	-	2	2	2	2	3	2
CO-5	3	2	2	3	2	2	-	-	2	2	2	2	2	2
Target Level	**3**	**2.8**	**2.8**	**2.4**	**2.2**	**2.4**	**-**	**-**	**2**	**2.4**	**2.4**	**2.4**	**2.6**	**2**

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Managerial Economics (RAS-501)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the Engineering Economics and Managerial Economics Concepts, Law of Demand, Price Elasticity of Demand & Types, Income Elasticity, uses and importance of elasticity.	**2**
2	Analyze Concept of demand and supply management. Methods or Techniques of Demand Forecasting. Demand Forecasting for a New Product.	**4**
3	Evaluate Cost Analysis, Types of Costs, Break- Even Analysis, Production functions. Economies of scale and Internal and external.	**4**
4	Analyze Market Structure, Perfect Competition, Imperfect competition – Monopolistic, Oligopoly, duopoly sorbent features of price determination and various market conditions.	**4**
5	Evaluate Nature and characteristics of Indian economy Investment decisions for boosting economy (National income and per capital income.	**6**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	3	2	1	2	1	2			2	2		2	
CO-2	2	3	2	2	3	1	1			1	2		2	
CO-3	3	3	1	2	3	2	2			1	2		1	
CO-4	3	3	2	2	3	1	2			1	2		1	
CO-5	2	3	1	2	3	1	2			2	1		1	
Target Level	**2.40**	**3**	**1.6**	**1.8**	**2.8**	**1.2**	**1.8**			**1.4**	**1.8**		**1.4**	

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Cyber Security (RUC-501)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Evaluate the computer network and information security needs of an organization. Explain the concepts of confidentiality, availability and integrity in context of information assurance.	**2,5**
2	Articulate the well-known cyber-attack incidents, explain the attack scenarios, and explain mitigation techniques.	**4**
3	Demonstrate expertise in configuring host and network level technical security controls to include host firewalls, user access controls, host logging, network filtering, intrusion detection and prevention and encryption at all levels.	**3**
4	Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.	**5**
5	To master understanding about regulations, cyber laws, IPR and it act in order to foster a culture of cyber security that promotes safe and appropriate use of cyberspace.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1			1	2			2			2	3	2		
CO-2	3	2	3							1	2	1		
CO-3	1	1	1	1	3		3			2	1	1		
CO-4	1		3		2	2	1	2		1	2	1		
CO-5			1			3	1	3		1	2	2		
Target Level	**1.67**	**1.5**	**1.8**	**1.5**	**2.5**	**2.5**	**1.75**	**2.5**		**1.4**	**2**	**1.4**		

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Electrical Machines-II (REE-501)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Analyze the performance of the synchronous machines using voltage regulation methods, voltage and frequency control, load sharing and parallel operation	**4**
2	Analyze the performance of salient pole synchronous machine using two reaction theory and effect of varying field current at different loads	**4**
3	Analyze the performance of induction machine using phasor diagram and torque slip characteristics	**4**
4	Analyze the performance of induction machine using different speed control methods	**4**
5	Analyze the performance of single-phase induction machine using no-load and block rotor test and different starting methods	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	2	3	-	-	-	-	1	1	3	3	3
CO-2	3	3	3	3	3	-	-	-	-	1	2	3	3	3
CO-3	3	3	3	3	2	-	-	-	-	1	1	3	3	3
CO-4	3	3	3	3	3	-	-	-	-	1	1	3	3	3
CO-5	3	3	2	2	3	-	-	-	-	1	1	3	3	3
Target Level	**3**	**3**	**2.6**	**2.6**	**2.8**	**-**	**-**	**-**	**-**	**1**	**1.2**	**3**	**3**	**3**

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Power Transmission & Distribution (REE-502)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the power system components, supply systems, type of conductors, basic laws and effects in transmission lines.	**2**
2	Evaluate the inductance and capacitance calculations in transmission lines and analyze their performances.	**5**
3	Understand the corona effect, interference with communication lines and overhead line insulators.	**2**
4	Analyze mechanical design of transmission lines and insulated cables.	**4**
5	Apply neutral grounding techniques to various distribution systems.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	1	1						2	3	1	2
CO-2	3	3	2	1	1						2	3	1	2
CO-3	3	3	2	1	1						2	3	1	2
CO-4	3	3	2	1	1						2	3	1	2
CO-5	3	3	2	1	1						2	3	1	2
Target Level	**3**	**3**	**2**	**1**	**1**						**2**	**3**	**1**	**2**

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Control System (REE-503)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Calculate the transfer function for the operation of open loop and closed loop control systems.	**3**
2	Evaluate the performance of basic control systems in the time domain.	**5**
3	Analyze the stability of linear time-invariant systems in time domain using Routh Hurwitz criterion and root locus technique.	**4**
4	Analyze the stability of linear time-invariant systems in frequency domain using Nyquist criterion and Bode plot.	**4**
5	Design different types of compensators to achieve the desired performance of control System by root locus and Bode plot method.	**6**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	2	3	1	1				1	3	3	3
CO-2	3	3	2	2	3	1	1				1	3	3	3
CO-3	3	3	2	2	3	1	1				1	1	3	3
CO-4	3	3	2	2	3	1	1				1	1	3	3
CO-5	3	3	2	2	3	1	1				1	1	3	3
Target Level	**3**	**3**	**2**	**2**	**3**	**1**	**1**				**1**	**1.8**	**3**	**3**

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Power System Optimization (REE-051)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the needs of optimization in basic engineering problems using classical linear optimization techniques.	**2**
2	Apply the nonlinear unconstraint and constraints optimization methods for solution of basic engineering problems.	**3**
3	Apply the dynamic programming methods for solution of basic engineering problems.	**3**
4	Apply the genetic algorithms for solution of basic engineering problems.	**3**
5	Analyze the mathematical models of various power system optimization problems and solutions using linear, non-linear optimization techniques and genetic algorithms.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	2	2	1	-	-	-	-	-	1	-	-	2	1
CO-2	3	2	2	1	-	-	-	-	-	1	-	-	2	1
CO-3	3	2	2	1	-	-	-	-	-	1	-	-	2	1
CO-4	3	2	2	1	2	-	-	-	-	1	-	-	2	1
CO-5	3	2	2	1	2	-	-	-	-	1	-	-	2	1
Target Level	**3**	**2**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**2**	**1**

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Internet of Things (REE-054)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the vision of IoT from a global context.	**2**
2	Apply the knowledge in applications of IoT for value creation.	**3**
3	Apply the concept of security, privacy, and governance in IoT	**3**
4	Apply IoT standardization & different interoperability concept in IoT.	**3**
5	Analyze different identity management models and vulnerabilities.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	1	2	2	1	2						2	1	3
CO-2	2	2	2	2	1	1						2	2	2
CO-3	2	1	3	1	2	1						1	1	3
CO-4	2	2	2	3	3	2						2	1	2
CO-5	3	2	1	1	1	2						1	2	3
Target Level	**2.2**	**1.6**	**2**	**1.8**	**1.6**	**1.6**						**1.6**	**1.4**	**2.6**

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Electrical Machines-II Lab (REE-551)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Evaluate the parameters and performance of the synchronous machines.	**4**
2	Synchronize two alternators for parallel operation.	**4**
3	Evaluate the parameters and performance of the three phase induction motors.	**4**
4	Evaluate the performance of single-phase induction motor under different operating conditions	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	3	3	1	-	-	3	2	2	3	2	-
CO-2	3	3	2	3	3	1	-	-	3	2	2	3	2	-
CO-3	3	3	2	3	3	1	-	-	3	2	2	3	2	-
CO-4	3	3	2	3	3	1	-	-	3	2	2	3	2	-
Target Level	**3**	**3**	**2**	**3**	**3**	**1**	-	-	**3**	**2**	**2**	**3**	**2**	-

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Control System Lab (REE-553)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Analyze the characteristics of control system components like ac servo motor, synchro, potentiometer, servo voltage stabilizer.	**4**
2	Analyze the performance of control systems with different controllers / compensators.	**4**
3	Analyze the behavior of dc motor in open loop and closed loop.	**4**
4	Analyze the system's stability with different methods of time & frequency domain using MATLAB software.	**4**
5	Apply the conversion of transfer functions into state space & vice versa and check the performance parameters in time domain response of a second order system for step input via MATLAB software.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	2	2	2	2	2	-	-	2	2	2	2	-
CO-2	2	2	2	2	2	2	2	-	-	2	2	2	2	-
CO-3	2	2	2	2	2	2	2	-	-	2	2	2	2	-
CO-4	2	2	2	2	2	2	2	-	-	2	2	2	2	-
CO-5	2	2	2	2	2	2	2	-	-	2	2	2	2	-
Target Level	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**-**	**-**	**2**	**2**	**2**	**2**	**-**

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Software Based Power System Lab (REE-554)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the basics of power systems.	**2**
2	Evaluate the transmission lines parameters using software-based simulations.	**5**
3	Evaluate the performance of transmission lines using software-based simulations.	**5**
4	Analyze the effect of corona, Ferranti, Sag & Tension on performance of transmission lines.	**4**
5	Understand the installation and operational guidelines of overhead and underground transmission systems.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	2	1	1	1	-	-	-	3	2	1	1	3	1
CO-2	3	3	2	2	3	-	-	-	3	2	1	1	3	1
CO-3	3	3	2	2	3	-	-	-	3	2	1	1	3	1
CO-4	3	3	2	2	3	-	-	-	3	2	1	1	3	1
CO-5	3	3	2	2	3	-	-	-	3	2	1	1	3	1
Target Level	**3**	**2.8**	**1.8**	**1.8**	**2.6**	**-**	**-**	**-**	**3**	**2**	**1**	**1**	**3**	**1**

Session: 2019-20 **Semester: 5th**

Subject Name (Code): Seminar-I (REE-555)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand research papers for exploring new fields and review reporting.	**2**
2	Evaluate new directions of various cutting-edge technologies.	**5**
3	Create various skills by preparing detailed report describing the project and results.	**6**
4	Effective communication by making an oral presentation to show the findings.	**3**
5	Create fact related knowledge by preparing detailed report describing the project and corresponding results.	**6**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	2	1				1	2	2	3	3
CO-2	3	3	3	3	3	1				1	2	2	3	3
CO-3	3	3	3	3	2	1				1	2	2	3	3
CO-4	3	3	3	3	2	1				1	2	2	3	3
CO-5	3	3	3	3	3	1				1	2	2	3	3
Target Level	**3**	**3**	**3**	**3**	**2.4**	**1**				**1**	**2**	**2**	**3**	**3**

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Industrial Management (RAS-601)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the concept and scope of Industrial Management. Productivity and its Definition, measurement, productivity index, types of production system, Industrial Ownership.	**2**
2	Analyze the functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, importance of HRM.	**4**
3	Evaluate Work Study and its definition, objectives, Production Planning and Control, Inventory Control, Inventory.	**5**
4	Analyze Quality Control, statistical quality control, Control charts for variables and attributes, Sampling and introduction to TQM.	**4**
5	Evaluate Project Management, Project network analysis, CPM, PERT and Project crashing and resource levelling.	**6**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	3	2	1	2	2	2			2	2		2	
CO-2	2	3	2	2	3	1	2			1	2		2	
CO-3	3	3	1	2	3	2	2			1	2		1	
CO-4	3	3	2	2	3	1	2			1	2		1	
CO-5	2	3	1	2	3	1	2			2	1		1	
Target Level	**2.40**	**3**	**1.6**	**1.8**	**2.8**	**1.4**	**2.0**			**1.4**	**1.8**		**1.4**	

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Sociology (RAS-602)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Develop knowledge and understanding of industrial sociology	**2**
2	Understanding causes and consequences of rise and development of industry	**2**
3	Familiarize with the process of industrialization in India	**3**
4	Know contemporary issues in industrial sociology	**3**
5	Application and use of models of industrialization and environmental issues	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	2	2	2	2	2	-	-	2	2	2	2	-
CO-2	2	2	2	2	2	2	2	-	-	2	2	2	2	-
CO-3	2	2	2	2	2	2	2	-	-	2	2	2	2	-
CO-4	2	2	2	2	2	2	2	-	-	2	2	2	2	-
CO-5	2	2	2	2	2	2	2	-	-	2	2	2	2	-
Target Level	**2**	**2**	**2**	**2**	**2**	**2**	**2**	-	-	**2**	**2**	**2**	**2**	-

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Power Electronics (REE-601)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the characteristics as well as the operation of BJT, MOSFET, IGBT, SCR, TRIAC and GTO and identify their use in the power switching applications	**3**
2	Analyse the non-isolated DC-DC converters and identify their use in different Power electronics applications.	**3**
3	Evaluate the performance parameters of phase-controlled rectifiers	**5**
4	Analyse single-phase ac voltage controllers, cyclo-converters and their various applications	**4**
5	Analyse the single-phase and three phase bridge inverters, Voltage source inverters and current source inverters	**6**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	1	2	2	-	-	-	-	-	-	2	2	2
CO-2	3	3	2	3	3	1	-	-	-	1	1	2	3	2
CO-3	3	3	2	3	2	1	-	-	-	1	1	2	2	3
CO-4	3	3	2	3	3	1	-	-	-	1	2	2	2	3
CO-5	3	3	2	3	2	2	-	-	-	2	2	3	3	1
Target Level	**3.00**	**3.00**	**1.8**	**2.8**	**2.40**	**1.25**	**-**	**-**	**-**	**1.25**	**1.5**	**2.20**	**2.4**	**2.2**

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Microprocessor (REE-602)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand microprocessors including various processes involved in their operation.	**2**
2	Understand the 8085 microprocessor, its pin configuration, internal architecture, addressing modes and instruction classification.	**2**
3	Understand the 8086 microprocessor, its architecture, operating modes, instruction set and interrupts.	**2**
4	Analyze different programming concepts, algorithms and assembly language programs.	**4**
5	Apply the different peripheral devices like 8237 DMA controller, 8253/8254 programmable counter and 8259 programmable interrupt controller with microprocessor and apply the different interfacing techniques.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	1	-	-	-	-	2	-	-	2	2	2
CO-2	3	3	2	2	1	-	-	-	2	-	-	2	2	2
CO-3	3	3	2	2	1	-	-	-	2	-	-	2	2	2
CO-4	3	3	3	3	-	-	-	-	2	-	-	2	3	2
CO-5	3	3	2	2	1	-	-	-	2	-	-	2	2	2
Target Level	**3**	**3**	**2.2**	**2**	**1**	**-**	**-**	**-**	**2**	**-**	**-**	**2**	**2.2**	**2**

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Power System Analysis (REE-603)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Draw reactance diagram from the single line diagram and calculate per unit (pu) reactance.	**3**
2	Analyze power system network during symmetrical and unsymmetrical fault conditions.	**4**
3	Perform load flow computations and analyze the load flow results.	**4**
4	Analyzing the steady state and transient state stability of power system network under various conditions.	**4**
5	Understand the concept of travelling waves in transmission lines under different terminating conditions .	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	1	1	1	1								1	1	
CO-2	3	2	2	2	1	1						2	2	
CO-3	3	2	2	2	2	1						2	2	
CO-4	3	2	2	2	1	1						2	2	
CO-5	2	1	2	2								1	2	
Target Level	**2.40**	**1.60**	**1.80**	**1.80**	**1.33**	**1.00**						**1.60**	**1.80**	

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Special Electrical Machines (REE-064)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the concepts of the construction, performance and control of poly phase AC machines.	**2**
2	Analyze the operation, performance and characteristics of SEIG, DEIG and two phase AC servomotors.	**3**
3	Understand the construction, working, performance of different types of motors used in industrial application like stepper motor, switched reluctance motor etc.	**2**
4	Apply the concept of permanent magnet machine and single phase synchronous motor.	**3**
5	Understand the working of single phase commutator motor and evaluate the characteristics of repulsion motor and linear induction motor.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	2	1	2	-	1	2	-	-	1	-	3	3	3
CO-2	3	2	1	2	-	1	2	-	-	1	-	3	3	3
CO-3	3	2	1	2	-	1	2	-	-	1	-	3	3	3
CO-4	3	2	1	2	-	1	2	-	-	1	-	3	3	3
CO-5	3	2	1	2	-	1	2	-	-	1	-	3	3	3
Target Level	**3**	**2**	**1**	**2**	**-**	**1**	**2**	**-**	**-**	**1**	**-**	**3**	**3**	**3**

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Power Electronics Lab (REE-661)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the V-I characteristics and basic operation of SCR. Study and understand the triggering of (i) IGBT (ii) MOSFET (iii) power transistor.	**2**
2	Analyze a single-phase half wave, fully controlled and half controlled rectifier circuit with different load conditions (i) resistive load (ii) inductive load.	**4**
3	Evaluate the performance of AC-AC converter with various loads and operations and also study the working of cyclo-converter.	**5**
4	Create the DC-DC converter circuits for different applications.	**6**
5	MATLAB simulation based analysis of DC-AC inverter circuit using MOSFET/IGBT.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	2	1				1	2	2	3	3
CO-2	3	3	3	3	3	1				1	2	2	3	3
CO-3	3	3	3	3	2	1				1	2	2	3	3
CO-4	3	3	3	3	2	1				1	2	2	3	3
CO-5	3	3	3	3	3	1				1	2	2	3	3
Target Level	**3**	**3**	**3**	**3**	**2.4**	**1**				**1**	**2**	**2**	**3**	**3**

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Microprocessor Lab (REE-662)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the basic concepts of 8085 microprocessor, its internal architecture and pin configuration.	**2**
2	Understand the basic concepts of 8086 microprocessor and its internal architecture.	**2**
3	Demonstrate the program using assembly language for 8085 microprocessor to perform the basic mathematical and logical operations.	**2**
4	Analyze the interfacing of 8085 kit with external devices and control their operations.	**4**
5	Analyze the interfacing of microprocessor 8085 with UART/USART	**4**
6	Understand the basic concepts of 8085 microprocessor, its internal architecture and pin configuration.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	2	2							2	2	2
CO-2	3	3	2	2	2							2	2	2
CO-3	3	3	3	3	2							2	2	2
CO-4	3	3	3	3	2							2	2	2
CO-5	3	3	3	3	2							2	2	2
Target Level	**3**	**3**	**2.6**	**2.6**	**2**							**2**	**2**	**2**

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Electrical Design & Fabrication Lab (REE-664)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the basics of circuit design and fabrication on PCBs.	**2**
2	Create the transformers and inductors	**6**
3	Create PCBs for various controllers by understanding the simulation of software-based controller circuits and create PCBs for various controllers.	**6**
4	Analyze the experimental concepts for evaluating the parameters of electric drives and the performance of the machines.	**3**
5	Prototyping Machines and the operational guidelines of VFDs.	**6**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	3	2					1	2	3	3	3
CO-2	3	2	2	2	3					1	1	3	3	3
CO-3	2	3	1	1	2					1	1	3	3	3
CO-4	3	2	3	2	2					3	1	3	3	3
CO-5	2	2	3	3	3					1	1	3	3	3
Target Level	**2.6**	**2.4**	**2.2**	**2.2**	**2.4**					**1.4**	**1.2**	**3**	**3**	**3**

Session: 2019-20 **Semester: 6th**

Subject Name (Code): Seminar-II (REE-665)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the research papers of a new field in the absence of a textbook and can review them.	**2**
2	Evaluate the concept of new directions of various cutting-edge technologies.	**4**
3	Understand and impart skills in preparing detailed reports describing the project and results.	**2**
4	Apply effective communication by making an oral presentation before an evaluation committee.	**3**
5	Evaluate and use an opportunity to exercise their rights to express themselves.	**5**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	3	2	1			3	1	3	2	
CO-2	3	3	3	3	3	2	1			3	1	3	2	
CO-3	3	3	3	3	3	2	1			3	1	3	2	
CO-4	3	3	3	3	3	2	1			3	1	3	2	
CO-5	3	3	3	3	3	2	1			3	1	3	2	
Target Level	**3**	**3**	**3**	**3**	**3**	**2**	**1**			**3**	**1**	**3**	**2**	

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Communication Systems (REN-701)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the concept of Amplitude modulation & demodulation, AM transmitters and receivers.	**2**
2	Understand the concept of Frequency modulation & demodulation, Noise in AM, and Noise in FM System.	**2**
3	Analyze Pulse Communication and Digital Modulation techniques.	**4**
4	Understand the concept of Radio Propagation and Satellite Communication.	**2**
5	Understand the concept of TV systems and Fiber Optical Communication systems	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	2	2								2	2
CO-2	3	3	3	2	2				1	1			2	2
CO-3	3	3	3	2	2				1	1			2	2
CO-4	3	3	3	2	2				1				2	2
CO-5	3	3	3	2	2								2	2
Target Level	**3**	**3**	**3**	**2**	**2**				**1**	**1**			**2**	**2**

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Power System Protection (REE-702)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the need for the protection of electric equipment and their protection schemes.	**2**
2	Describe different types of relays used for power system protection and its application	**2**
3	Identify the appropriate protection schemes for transmission line protection along with the concept of auto reclosing.	**3**
4	Understand the concept of arc extinction theories of circuit breakers and CB testing methods	**2**
5	Illustrate feasible protection schemes for each main part of the power system and understand the operation of AC and D.C circuit breakers .	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	1	2	1	1	1						2	1	
CO-2	2	1	2	1	2	2						2	2	
CO-3	2	1	2	1	2	2						2	2	
CO-4	2	1	2	1	1	1						2	1	
CO-5	2	1	2	1	2	2						2	2	
Target Level	**2.00**	**1.00**	**2.00**	**1.00**	**1.60**	**1.60**						**2.00**	**1.60**	

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Utilization of Electrical Energy & Electric Traction (REE-071)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand different types of electric heating.	**2**
2	Analyze concept of electric welding and electrolyte process.	**3**
3	Design of interior and exterior lighting systems- illumination levels for various purposes light fittings- factory lighting- flood lighting- street lighting.	**6**
4	Apply concepts related to the fundamental concepts of electric traction.	**3**
5	Understand to apply the knowledge of power electronics converters in Electric Traction.	**3**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	2	2	2	2					2	2	2	
CO-2	3	2	2	2	2	2					2	2	2	
CO-3	3	3	3	2	2	2					2	2		
CO-4	3	3	2	2	2	2					2	2	1	
CO-5	3	2	2	2	2	2					2	2	1	
Target Level	**2.80**	**2.40**	**2.2**	**2.0**	**2.0**	**2.00**					**2.00**	**2.00**	**1.50**	

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Understanding The Human Being Comprehensively (ROE-074)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the comprehensive human goal of life.	**2**
2	Understand the harmony of nature and existence.	**2**
3	Analyze the activities of self in its completeness.	**4**
4	Analyze the coexistence in all four orders of nature.	**4**
5	Analyze the human traditions from self to entire existence.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1						3	3	3	3	3	3	3		
CO-2						3	3	3	3	3	3	3		
CO-3						3	3	3	3	3	3	3		
CO-4						3	3	3	3	3	3	3		
CO-5						3	3	3	3	3	3	3		
Target Level						**3**	**3**	**3**	**3**	**3**	**3**	**3**		

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Energy Efficiency & Conservation (REE-076)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the energy conservation techniques in the surrounding industries and familiarization with energy conservation legislation	**2**
2	Analyze the aim and strategy of energy audit, can use the instruments for it, and explain HVAC systems.	**4**
3	Understand concept, scope, evolution, strategy, and application of Demand Side Management (DSM).	**2**
4	Apply the concept of calculation and control of various voltage and reactive power parameters.	**3**
5	Analyze and about load scheduling, testing and controlling energy-efficient motors, and different parameter control of lighting system.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	3	3	2		3	3	3	2	2	
CO-2	3	3	3	3	3	3	2		3	3	3	2	2	
CO-3	3	3	3	3	3	3	2		3	3	3	2	2	
CO-4	3	3	3	3	3	3	2		3	3	3	2	2	
CO-5	3	3	3	3	3	3	2		3	3	3	2	2	
Target Level	**3**	**3**	**3**	**3**	**3**	**3**	**2**		**3**	**3**	**3**	**2**	**2**	

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Reliability Engineering (REE-077)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the concepts of Reliability, types of failures and system effectiveness	**2**
2	Analyze the basic techniques for reliability calculations	**4**
3	Apply system reliability models for different configurations	**3**
4	Evaluate strategies for improving reliability of different systems	**5**
5	Evaluate reliability of components and systems using field and test data	**5**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	3	2	3	2					2	2	2	2	2
CO-2	3	3	2	3	3					3	2	2	2	2
CO-3	2	3	3	3	2					2	3	3	2	2
CO-4	3	3	3	2	3					3	3	2	2	2
CO-5	3	2	2	3	3					2	2	3	2	3
Target Level	**2.6**	**2.8**	**2.4**	**2.8**	**2.6**					**2.4**	**2.4**	**2.4**	**2**	**2.2**

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Industrial Automation & PLC Lab (REE-751)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand automation, PLC, I/O modules of PLC, Programming languages and instructions of PLC	**2**
2	Analyze Ladder diagram concept to test digital logic gates, Boolean expression, Demorgan's theorem.	**3**
3	Understand the Ladder program for DOL starter, timers, and counters	**2**
4	Understand evolution and architecture of DCS, hierarchical control in DCS, programming DCS	**2**
5	Explain the concept of basic digital electronics and data manipulation, basic PLC circuits for entry-level PLC applications.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	3	1	1		2	3	3	3	3	3
CO-2	3	3	3	3	3	1	1		2	3	3	3	3	3
CO-3	3	3	3	3	3	1	1		2	3	3	3	3	3
CO-4	3	3	3	3	3	1	1		2	3	3	3	3	3
CO-5	3	3	3	3	3	1	1		2	3	3	3	3	3
Target Level	**3.00**	**3.0**	**3.0**	**3.0**	**3.0**	**1**	**1**		**2.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Power System Lab (REE-752)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Determine the direct axis reactance (Xd), quadrature axis reactance (Xq), sub transient direct axis reactance and sub transient quadrature axis reactance of a salient pole alternator.	**5**
2	Analyze the characteristic of IDMT over current relay & percentage differential relay	**4**
3	Understand the concept to locate fault in cables.	**2**
4	Determine the break down voltage of transformer oil.	**5**
5	Estimate load flow analysis, transmission line performance of power system, symmetrical fault and unsymmetrical fault analysis using MATLAB.	**5**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	1	1	2								2	2	
CO-2	3	2	2	2								2	3	
CO-3	3	1	1	1								2	3	
CO-4	3	2	2	3								2	3	
CO-5	3	3	2	3	3							2	3	
Target Level	**3**	**1.8**	**1.6**	**2.2**	**3**							**2**	**2.8**	

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Industrial Training (REN-753)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Analyze comprehensive learning platform to students where they can enhance their employ ability skills and become job ready along with real corporate exposure.	**4**
2	Apply skills to enhance students' knowledge in one particular technology.	**3**
3	Apply practical skills to Increase self-confidence of students and helps in finding their own proficiency	**3**
4	Evaluate leadership ability and responsibility to perform or execute the given task.	**5**
5	Evaluate the industrial exposure to provide learners hands on practice within a real job situation.	**5**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	2	2	2	3	3	2	2	3	2	3	2	3	2	3
CO-2	2	2	3	3	3	3	2	2	2	3	3	3	2	2
CO-3	3	2	2	3	3	3	2	3	3	3	3	3	2	3
CO-4	2	2	3	3	3	3	3	2	2	3	3	3	3	2
CO-5	3	2	3	2	3	3	2	3	2	3	2	3	2	3
Target Level	**2.4**	**2**	**2.6**	**2.8**	**3**	**2.8**	**2.2**	**2.6**	**2.2**	**3**	**2.6**	**3**	**2.2**	**2.6**

Session: 2019-20 **Semester: 7th**

Subject Name (Code): Project-1 (REN-754)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Demonstrate a sound technical knowledge of their selected project topic.	**2**
2	Identification of problem, interpretation and solution.	**3**
3	Formulate engineering solutions to complex problems utilizing a systems approach.	**6**
4	Design and develop an engineering project and Communicate with engineers and the community at large in written and oral forms.	**6**
5	Demonstrate the knowledge, skills and attitudes of a professional engineer as a team.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	2	2	1	2	2	2	2	2	2	2	2
CO-2	2	3	2	2	2	1	2	2	2	2	2	2	2	2
CO-3	3	3	3	3	3	2	2	2	2	2	2	2	2	3
CO-4	2	3	3	2	2	3	2	2	2	3	3	3	3	3
CO-5	2	2	2	2	2	3	2	2	3	3	3	2	3	3
Target Level	**2.4**	**2.8**	**2.4**	**2.2**	**2.2**	**2**	**2**	**2**	**2.2**	**2.4**	**2.4**	**2.2**	**2.4**	**2.6**

Session: 2019-20 **Semester: 8th**

Subject Name (Code): Machine Learning (ROE-083)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Gain knowledge about basic concepts of Machine Learning, designing a learning system and identify machine learning techniques suitable for a given problem.	**2**
2	Understand and apply decision tree learning, fundamentals of artificial neural networks, apply backpropagation algorithm, algorithm convergence and generalization.	**3**
3	Evaluating hypothesis, estimating hypothesis accuracy, Bayesian learning and applying optimal classifier and EM algorithm.	**4**
4	Understand computational learning, Instance based learning, k-nearest neighbor learning, locally weighted regression, radial basis function networks, case -based learning.	**5**
5	Understand and apply concepts of Genetic algorithm, hypothesis space search, genetic programming, learning first order rules, reinforcement learning.	**6**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	2	2								1	**1**
CO-2	3	3	3	2	2									**1**
CO-3	3	3	3	2	2								1	**1**
CO-4	3	3	3	2	2									**1**
CO-5	3	3	3	2	2								1	**1**
Target Level	**3**	**3**	**3**	**2**	**2**								**1**	**1**

Session: 2019-20 **Semester: 8th**

Subject Name (Code): Renewable Energy Resources (ROE-086)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand various non-conventional energy resources and their availability along with knowledge on Solar Cells	**2**
2	Understand solar radiation, flat plate collectors and focusing type collector along with solar thermal power plants knowledge.	**2**
3	Analyze Geothermal Energy, Magneto-hydrodynamics and Fuel Cells	**4**
4	Analyze thermo-electrical and thermionic Conversions and wind energy	**4**
5	Understand Bio-mass, Ocean Thermal Energy Conversion and Wave and Tidal Wave	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	1	1	3	2	3			1		2		
CO-2	2	3	3	2	3	3	3			1		3		2
CO-3	3	3	3	2	3	2	3			1		2		1
CO-4	2	3	3	2	3	3	3			1		3		1
CO-5	3	3	3	1	2	3	3			1		3		2
Target Level	**2.6**	**3**	**2.6**	**1.6**	**2.8**	**2.6**	**3**			**1**		**2.6**		**1.5**

Session: 2019-20 **Semester: 8th**

Subject Name (Code): Value, Relationship & Ethical Human Conduct (ROE-088)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Verify the human aspirations, comprehensive human goal, need for undivided society, universal human order.	**5**
2	Validate the fulfillment in relationship with other human being.	**5**
3	Analyze the concept of justice in family to world family and universal human order.	**4**
4	Analyze the program for ensuring undivided human society and universal human order.	**4**
5	Understand the concepts of Human Tradition.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1						3	3	3	3	3	3	3		
CO-2						3	3	3	3	3	3	3		
CO-3						3	3	3	3	3	3	3		
CO-4						3	3	3	3	3	3	3		
CO-5						3	3	3	3	3	3	3		
Target Level						**3**	**3**	**3**	**3**	**3**	**3**	**3**		

Session: 2019-20 **Semester: 8th**

Subject Name (Code): Optical Fiber Communication (REN-080)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the optical fiber communication system & principle of optical fiber wave guide	**2**
2	Apply the concept of Transmission Characteristics, Attenuation & losses in optical fiber communication system.	**3**
3	Evaluate the basic concepts Einstein relations and population inversion optical feedback, direct - indirect band gap, Hetero junction & DH structure & drawbacks.	**5**
4	Apply the concept of photo detections, characteristics of photo detectors, photoconductors & direct detection receiver performance.	**3**
5	Analyze the principal Components of an optical fiber communication system and Optical Power meters.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	2	2								1	1
CO-2	3	3	3	2	2									1
CO-3	3	3	3	2	2								1	1
CO-4	3	3	3	2	2									1
CO-5	3	3	3	2	2								1	1
Target Level	**3**	**3**	**3**	**2**	**2**								**1**	**1**

Session: 2019-20 **Semester: 8th**

Subject Name (Code): Power Theft & Energy Management (REE-086)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Apply the concepts of Energy Demand and Supply, Energy Crisis and Power Theft (National and Global Scenario).	**3**
2	Apply the knowledge to identify the basic techniques for tempering and Power Theft in Electro- mechanical and Electronic Energy Meters.	**3**
3	Analyze the knowledge to assess the different methods of Energy Conservation, Energy Audit and Site Surveys.	**4**
4	Analyze knowledge to discuss and Estimate Electrical Load, Lighting Management and Demand Side Management.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	2	3							3	3	3
CO-2	3	3	2	2	3							3	3	3
CO-3	3	3	2	2	3							3	3	3
CO-4	3	3	2	2	3							3	3	3
Target Level	**3**	**3**	**2**	**2**	**3**							**3**	**3**	**3**

Session: 2019-20 **Semester: 8th**

Subject Name (Code): GD & Seminar (REN-851)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Understand the themes, implications of topic, ethical and social understandings on society.	**2**
2	Explore creative avenues of expression, solve problems, and make consequential decisions.	**3**
3	Analyze to improve the mass communication by GD and seminar.	**4**
4	Create an opportunity to exercise their rights to express themselves.	**5**
5	Evaluate the purpose of life and meaning through transformative experiences that foster an understanding of self and global perspectives.	**4**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	3	3	3	2	2		3	3	3	3	3	
CO-2	3	3	3	3	3	2	2		3	3	3	3	3	
CO-3	3	3	3	3	3	2	2		3	3	3	3	3	
CO-4	3	3	3	3	3	2	2		3	3	3	3	3	
CO-5	3	3	3	3	3	2	2		3	3	3	3	3	
Target Level	**3**	**3**	**3**	**3**	**3**	**2**	**2**		**3**	**3**	**3**	**3**	**3**	

Session: 2019-20 **Semester: 8th**

Subject Name (Code): Project-2 (REN-852)

S No.	Course Outcomes	BL
After completion of the course, the student will be able to		
1	Demonstrate a sound technical knowledge of their selected project topic.	**2**
2	Identification of problem, interpretation and solution..	**3**
3	Formulate engineering solutions to complex problems utilizing a systems approach.	**6**
4	Design and develop an engineering project and Communicate with engineers and the community at large in written and oral forms.	**6**
5	Demonstrate the knowledge, skills and attitudes of a professional engineer as a team.	**2**

PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO1	PSO2
CO-1	3	3	2	2	2	1	2	2	2	2	2	2	2	2
CO-2	2	3	2	2	2	1	2	2	2	2	2	2	2	2
CO-3	3	3	3	3	3	2	2	2	2	2	2	2	2	3
CO-4	2	3	3	2	2	3	2	2	2	3	3	3	3	3
CO-5	2	2	2	2	2	3	2	2	3	3	3	2	3	3
Target Level	**2.4**	**2.8**	**2.4**	**2.2**	**2.2**	**2**	**2**	**2**	**2.2**	**2.4**	**2.4**	**2.2**	**2.4**	**2.6**