Course Outcome

Session 2021-22

Department of Electrical & Electronics Engineering

Index

Session: 2021-22 **Semester: 3rd**

Subject Name (Code): Introduction to Soft Computing (KOE-036)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Analyze the concepts of learning in basic neural networks, back-propagation neural networks, Kohnen's self organizing networks and Hopfield networks.	4	M
2	Analyze working of fuzzy decision making, rule-based structure identification and fuzzy control systems.	4	M
3	Apply supervised, unsupervised and optimization techniques in adaptive neuro fuzzy networks development.	3	C
4	Analyze the working of Genetic algorithm.	4	M
5	Apply genetic algorithm and neuro fuzzy networks for solving travelling salesman problem and internet search problem.	3	C

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	3
CO-2	3	3	3	3	3	2	-	-	-	-	-	2	2	3
CO-3	3	3	3	3	3	2	2	-	1	-	-	2	2	3
CO-4	3	3	3	3	3	2	2	-	1	-	-	2	2	3
CO-5	3	2	3	3	3	2	2	-	2	-	-	2	2	3
Target Level	3	2.8	3	3	3	2	2	-	1.33	-	-	2	2	3

Session: 2021-22 **Semester: 3rd**

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

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the concept of PN junction and special purpose diodes.	2	C
2	Study the application of conventional diode and semiconductor diode.	1	C
3	Analyze the I-V characteristics of BJT and FET.	4	C, M
4	Analyze the application of Op-Amp, amplifiers, integrator, and differentiator.	4	C, M
5	Understand the concept of digital storage oscilloscope and compare of DSO with analog oscilloscope.	2	C, P

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: 2021-22 **Semester: 3rd**

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

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society.	2	F
2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	2	C
3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society.	2	C
4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	2	M
5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	2	M

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	2	3	2	2	-	-
CO-2	-	-	-	-	-	-	-	1	1	3	2	2	-	-
CO-3	-	-	-	-	-	-	-	1	2	3	2	2	-	-
CO-4	-	-	-	-	-	1	1	-	1	3	2	3	-	-
CO-5	-	-	-	-	-	-	-	-	2	3	2	1	-	-
Target Level	-	-	-	-	-	1	1	1	1.6	3	2	2	-	-

Session: 2021-22 **Semester: 3rd**

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

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Apply different coordinate systems and their application in electromagnetic field theory.	3	C
2	Analyze the concept of static electric field, current, properties of conductors and boundary conditions.	4	P
3	Analyze the concept of static magnetic field, magnetic scalar and vector potential.	4	P
4	Analyze the forces due to magnetic field, magnetization, magnetic boundary conditions and inductors.	4	P
5	Analyze displacement current, time varying fields, propagation and reflection of EM waves and transmission lines.	6	M

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	-	2	3	3
CO-2	3	3	3	3	3	-	-	-	1	2	-	2	3	3
CO-3	3	3	3	3	3	-	-	-	1	2	-	2	3	3
CO-4	3	3	3	3	3	-	-	-	1	2	-	2	3	3
CO-5	3	3	3	3	3	-	-	-	1	2	-	2	3	3
Target Level	3	3	3	3	3	-	-	-	1	2	-	2	3	3

Session: 2021-22 **Semester: 3rd**

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

S No.	Course Outcomes	BL	KL
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	P
2	Understand the knowledge of measurement of electrical quantities resistance, inductance and capacitance with the help of bridges	2	C
3	Demonstrate the working of instrument transformers as well as evaluate the errors in current and potential transformers	2	P
4	Illustrate the working of electronic instruments like voltmeter, multi-meter, frequency meter and CRO.	2	P
5	Understand the knowledge of transducers, their classifications and their applications for the measurement of physical quantities like motion, force, pressure, temperature, flow and liquid level.	2	C

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	1	1	1	-	-	-	-	2	3	-
CO-2	3	3	3	3	3	2	1	-	-	-	-	2	3	-
CO-3	2	3	3	3	3	2	1	-	-	-	-	2	3	-
CO-4	3	3	3	2	3	2	1	-	-	-	-	2	3	-
CO-5	3	3	3	3	3	2	2	-	-	-	-	2	3	-
Target Level	2.80	3	3	2.6	2.6	1.8	1.2	-	-	-	-	2.0	3	-

Session: 2021-22 **Semester: 3rd**

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

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Represent the various types of signals & systems and can perform mathematical operations on them.	2	C
2	Analyze the response of LTI system to Fourier series and Fourier transform and to evaluate their applications to network analysis.	4	P
3	Analyze the properties of continuous time signals and system using Laplace transform and determine the response of linear system to known inputs.	4	P
4	Analyze the concept of state-space and develop state-space models of SISO & MIMO system.	4	P
5	Implement the concepts of Z transform to solve complex engineering problems using difference equations.	4	P

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	1	1	-	-	-	-	-	-	2	2	1
CO-2	3	3	3	1	1	-	-	-	-	-	-	2	2	1
CO-3	3	3	3	2	1	-	-	-	-	-	-	2	2	1
CO-4	3	3	3	2	1	-	-	-	-	-	-	1	2	1
CO-5	3	3	3	2	1	-	-	-	-	-	-	1	2	1
Target Level	3	3	3	1.6	1	-	-	-	-	-	-	1.6	2	1

Session: 2021-22 **Semester: 3rd**

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

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

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: 2021-22 **Semester: 3rd**

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

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

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	3	3	3	1	-	-	2	2	2	3	2	2
CO-2	2	3	3	3	3	1	-	-	2	2	2	3	2	2
CO-3	2	3	3	3	3	1	-	-	2	2	2	3	2	2
CO-4	2	3	3	3	3	1	-	-	2	2	2	3	2	2
CO-5	2	3	3	3	3	1	-	-	2	2	2	3	2	2
Target Level	2	3	3	3	3	1	-	-	2	2	2	3	2	2

Session: 2021-22 **Semester: 3rd**

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

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

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: 2021-22 **Semester: 3rd**

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

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand research papers for exploring new fields and review reporting.	2	C
2	Evaluate new directions of various cutting edge technologies.	5	P
3	Create various skills by preparing detailed project report including all the findings.	6	C, P
4	Effective communication by making an oral presentation to show the findings.	3	P
5	Create facts related knowledge by preparing detailed report including outcomes.	6	C, P

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: 2021-22 **Semester: 4th**

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

S No.	Course Outcomes	BL	KL
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	P
2	Understand the classification of second order partial differential equations and by using the	3	P
3	Method of separation of variables to evaluate the general solution of Heat, Wave, Laplace equations and Transmission lines.	4	P
4	Remember the concept of moments, skewness, kurtosis and moment generating function and analyze the linear and non-linear regression.	4	P
5	Remember the concept of probability, random variable and apply for solving the problem related to discrete and continuous probability distribution	3	P

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: 2021-22 **Semester: 4th**

Subject Name (Code): Universal Human Values & Professional Ethics (KVE-401)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the essential complementarities between 'VALUES" and 'SKILLS' with its relation of engineering concept.	2	F,C
2	Analyze the sustained happiness and prosperity which are the core aspirations of all human beings keeping social environmental, economic, political scenario.	4	F,C
3	Apply the development of a Holistic perspective among students.	3	C, P
4	Apply the value-based living in a natural way using technological advancement.	3	C, P
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	F, C

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: 2021-22 **Semester: 4th**

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

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Implement gates using concepts of binary number system	3	C
2	Design combinational logic circuits	4	P
3	Design sequential logic circuits	4	P
4	Implement the design of synchronous & asynchronous sequential circuits	3	P
5	Apply the concept of Digital Logic Families in circuit-implementation	3	C

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	3	2	2	-	-	-	-	-		1	-	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
CO-5	3	3	3	3	3	-	-	-	-	-	1	3	-	3
Target Level	3.0	2.8	3.0	2.8	2.8	-	-	-	-	-	1	1.8	-	1.8

Session: 2021-22 **Semester: 4th**

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

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

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: 2021-22 **Semester: 4th**

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

S No.	Course Outcomes	BL	KL
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.	BL 3	C
2	Analyze the AC and DC circuits using Kirchhoff's law and Network simplification theorems.	BL 4	P
3	Analyze steady-state responses and transient response of DC and AC circuits using classical and Laplace transform methods.	BL 4	P
4	Demonstrate the concept of complex frequency and analyze the structure and function of one and two port network.	BL 4	P
5	Synthesize one port network and analyze different filters.	BL 6	M

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: 2021-22 **Semester: 4th**

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

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Apply the knowledge of basic circuital law, nodal and mesh analysis for given circuit.	3	P
2	Analyze AC and DC circuits using simulation techniques.	4	C
3	Analyze the transient response of AC circuits.	4	C
4	Evaluate the two-port network parameters.	5	P
5	Estimate the parameters of different filters.	5	P

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	3	-	-	-	-	-	-	2	2	1
CO-2	3	3	3	2	3	-	-	-	-	-	-	2	2	1
CO-3	3	3	3	2	3	-	-	-	-	-	-	2	2	1
CO-4	3	3	3	2	3	-	-	-	-	-	-	2	2	1
CO-5	3	3	3	2	3	-	-	-	-	-	-	2	3	2
Target Level	3	3	3	2	3	-	-	-	-	-	-	2	2.20	1.20

Session: 2021-22 **Semester: 4th**

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

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

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: 2021-22 **Semester: 4th**

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

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

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	2	2	3	3	3	-	-	2	2	2	2	3	2
CO-5	3	3	3	3	2	3	-	-	2	2	2	3	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: 2021-22 **Semester: 5th**

Subject Name (Code): Power System-I (KEE-501)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Describe the working principle and basic components of conventional and nonconventional power plants as well as the other aspects of power generation.	2	F, C
2	Analyze the role and functioning of different types of supply systems, conductors and performance of transmission lines.	4	C, P
3	Calculate the sag and tension in overhead lines with wind & ice loading, potential distribution over a string of insulators, string efficiency and its improvement.	3	C, P
4	Calculate the inductance and capacitance of single phase, three phase lines with symmetrical and unsymmetrical spacing including effect of earth on capacitance of transmission lines.	3	C, P
5	Calculate the resistance and capacitance parameters of different types of cables including grading of cables.	3	C, P

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	3	2	-	-	1	-	-	-	-	1	3	1
CO-2	3	3	3	2	-	-	-	-	-	-	-	1	3	1
CO-3	3	3	3	2	-	-	-	-	-	-	-	1	3	1
CO-4	3	3	3	2	-	-	-	-	-	-	-	1	3	1
CO-5	3	3	3	2	-	-	-	-	-	-	-	1	3	1
Target Level	3	2.8	3	2	-	-	1	-	-	-	-	1	3	1

Session: 2021-22 **Semester: 5th**

Subject Name (Code): Control System (KEE-502)

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

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: 2021-22 **Semester: 5th**

Subject Name (Code): Electrical Machines-II (KEE-503)

S No.	Course Outcomes	BL	KL
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	M
2	Analyze the performance of salient pole synchronous machine using two reaction theory and effect of varying field current at different loads	4	P
3	Analyze the performance of induction machine using phasor diagram and torque slip characteristics	4	P
4	Analyze the performance of induction machine using different speed control methods	4	M
5	Analyze the performance of single-phase induction machine using no-load and block rotor test and different starting methods	4	P

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: 2021-22 **Semester: 5th**

Subject Name (Code): Robotics (KEE-051)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Express the basic terminology used in robotics.	2	C
2	Explore 3-D translation & orientation of robot arm kinematics.	3	P
3	Classify different robotic actuators and power transmission systems.	4	C
4	Classify the types of robotic grippers used in automation industries.	4	P
5	Describe robotic sensorics systems and their interfacing with robot controllers.	1	P

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	1	1	-	-	2	-	-	-	-	1	-	-
CO-2	3	3	2	1	-	2	3	-	-	1	2	2	1	2
CO-3	3	1	2	1	-	-	3	-	-	-	-	2	-	-
CO-4	1	2	1	1	-	-	2	-	-	-	-	1	-	-
CO-5	3	3	3	2	2	2	3	-	1	2	3	3	2	3
Target Level	2.4	2	1.8	1.1	2	2	2.6	-	1	1.5	2.5	1.8	1.5	2.5

Session: 2021-22 **Semester: 5th**

Subject Name (Code): Sensors & Transducers (KEE-052)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Complete understanding of sensors used in industry for measurement of displacement, force and pressure.	2	C
2	Understanding of sensors in industry for measurement of temperature, position, accelerometer, vibration sensor, flow and level.	2	C
3	Understand image processing and analysis, training the vision system in a pick and place robot.	2	C
4	Complete understanding of concepts related to signal conditioning and data acquisition methods	2	C
5	Understand the usage of smart sensors and their applications in automation systems	2	P

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	-	1	-	-	2	2	1
CO-2	2	1	2	2	1	-	1	-	-	-	-	1	2	2
CO-3	2	1	1	1	1	-	1	-	1	-	-	2	1	1
CO-4	1	2	1	1	2	-		-	1	-	-	1	2	2
CO-5	2	1	1	1	1	-	1	-	1	-	-	1	2	2
Target Level	1.80	1.20	1.40	1.20	1.20	-	1.00	-	1.00	-	-	1.40	1.80	1.60

Session: 2021-22 **Semester: 5th**

Subject Name (Code): Industrial Automation & Control (KEE-053)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	To understand the concept of automation, its terminology and basic communication protocols	2	C
2	To understand the working and applications of relay	3	P
3	To learn the basics of PLC ,its operation and applications in automation.	3	P
4	To study the basics of industrial sensors and its interfacing	3	P
5	To understand the basics of pneumatic systems and its applications	3	P

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	-	1	-	-	2	2	1
CO-2	2	1	2	2	1	-	1	-	-	-	-	1	2	2
CO-3	2	1	1	1	1	-	1	-	1	-	-	2	1	1
CO-4	1	2	1	1	2	-	-	-	1	-	-	1	2	2
CO-5	2	1	1	1	1	-	1	-	1	-	-	1	2	2
Target Level	1.80	1.20	1.40	1.20	1.20	-	1.00	-	1.00	-	-	1.40	1.80	1.60

Session: 2021-22 **Semester: 5th**

Subject Name (Code): Neural Network & Fuzzy System (KEE-056)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand and analyze the concepts of learning in neural network.	4	C
2	Apply neural network for designing linear and non-linear type problems.	3	C
3	Understand and analyze the concepts of fuzzy logic.	4	M
4	Apply fuzzy logic for designing control systems.	3	M
5	Understand the concepts of neuro-fuzzy networks and apply neuro-fuzzy systems for solving conventional problems.	3	C

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	-	1	-	-	2	2	1
CO-2	2	1	2	2	1	-	1	-	-	-	-	1	2	2
CO-3	2	1	1	1	1	-	1	-	1	-	-	2	1	1
CO-4	1	2	1	1	2	-	-	-	1	-	-	1	2	2
CO-5	2	1	1	1	1	-	1	-	1	-	-	1	2	2
Target Level	1.80	1.20	1.40	1.20	1.20	-	1.00	-	1.00	-	-	1.40	1.80	1.60

Session: 2021-22 **Semester: 5th**

Subject Name (Code): Digital Signal Processing (KEE-057)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand discrete sequence, LTI systems and frequency domain of discrete sequence.	2	C
2	Understand sampling of signal, its reconstruction and sampling effect in A/D and D/A conversion.	2	C
3	Evaluate the response of LTI systems and rational system functions.	5	P
4	Analyze IIR & FIR filters.	4	P
5	Analyze DFT using efficient algorithm like FFT in decimation in time and in decimation in frequency.	4	P

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	2	-	-	-	-	-	-	1	3	1	2
CO-2	3	2	2	2	-	-	-	-	-	-	1	3	1	2
CO-3	3	2	2	2	-	-	-	-	-	-	1	3	1	2
CO-4	3	2	2	2	-	-	-	-	-	-	1	3	1	2
CO-5	3	2	2	2	-	-	-	-	-	-	1	3	1	2
Target Level	3	2	2	2	-	-	-	-	-	-	1	3	1	2

Session: 2021-22 **Semester: 5th**

Subject Name (Code): Analog & Digital Communication (KEE-058)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Remember the concept of Amplitude Modulation in communication system.	1	C
2	Understand the concept of Frequency & Phase modulation.	2	C
3	Apply the concept of Pulse Modulation Techniques.	3	P
4	Analyze the concept of Digital Modulation Techniques and their use in communication system.	4	P
5	Analyze the concept of Information Theory in Communication Engineering.	4	P

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	-	-	-	-	-	-	2	2	2
CO-2	3	3	2	3	2	-	-	-	-	-	-	3	2	2
CO-3	3	3	3	3	3	-	-	-	-	-	-	3	2	3
CO-4	3	3	3	3	3	-	-	-	-	-	-	3	2	3
CO-5	2	2	2	2	1	-	-	-	-	-	-	2	2	1
Target Level	2.6	2.6	2.4	2.8	2.0	-	-	-	-	-	-	2.6	2.0	2.2

Session: 2021-22 **Semester: 5th**

Subject Name (Code): Power System Lab-I (KEE-551)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Formulate a program/simulation model for calculation of various parameters of transmission line	6	P
2	Formulate a program to determine the ABCD constant of transmission line	6	P
3	Formulate a program /simulation model to determine the Ferranti effect in transmission line	6	P
4	Formulate a program /simulation model to determine the sag & tension and string efficiency of insulator of transmission line	6	P
5	Formulate a program /simulation model to determine the skin effect, and ground clearance of transmission line	6	P

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	1	-	2	2	-
CO-2	3	2	2	1	2	-	-	-	1	1	-	2	2	-
CO-3	3	2	2	1	2	-	-	-	1	1	-	2	2	-
CO-4	3	2	2	1	2	-	-	-	1	1	-	2	2	-
CO-5	3	2	2	1	2	-	-	-	1	1	-	2	2	-
Target Level	3	2	2	1	2	-	-	-	1	1	-	2	2	-

Session: 2021-22 **Semester: 5th**

Subject Name (Code): Control System Lab (KEE-552)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Analyze the characteristics of control system components like ac servo motor, synchro, potentiometer, servo voltage stabilizer.	4	P
2	Analyze the performance of control systems with different controllers / compensators.	4	P
3	Analyze the behavior of dc motor in open loop and closed loop.	4	P
4	Analyze the system's stability with different methods of time & frequency domain using MATLAB software.	4	P,M
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	P,M

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: 2021-22 **Semester: 5th**

Subject Name (Code): Electrical Machines-II Lab (KEE-553)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Evaluate the parameters and performance of the synchronous machines.	4	M
2	Synchronize two alternators for parallel operation.	4	M
3	Evaluate the parameters and performance of the three phase induction motors.	4	M
4	Evaluate the performance of single-phase induction motor under different operating conditions	4	M
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	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	-
CO-5	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: 2021-22 **Semester: 5th**

Subject Name (Code): Mini Project or Internship Assessment (KEN-554)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand research papers for exploring new fields and review reporting.	2	C
2	Evaluate new directions of various cutting-edge technologies.	5	P
3	Create various skills by preparing detailed project report including all the findings.	6	C, P
4	Effective communication by making an oral presentation to show the findings.	3	P
5	Create facts related knowledge by preparing detailed report including outcomes.	6	C, P

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: 2021-22 **Semester: 6th**

Subject Name (Code): Power System-II (KEE-601)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Analyze the role of components and one line diagram in power system studies including network under both balanced and unbalanced fault conditions.	4	C, P
2	Perform load flow analysis of an electrical power network.	4	C, P
3	Apply the concept of travelling wave theory in transmission lines operations.	3	C, P
4	Analyze the steady state and transient state stability of the power system under various conditions.	4	C
5	Understand the operating principle and applications of various types of relays and circuit breakers in power systems.	2	C

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	-	3	-
CO-2	3	3	3	1	-	-	-	-	-	-	1	-	3	-
CO-3	3	3	2	1	-	-	-	-	-	-	1	-	3	-
CO-4	3	3	3	1	-	-	-	-	-	-	1	-	3	-
CO-5	3	3	2	1	-	-	-	-	-	-	1	-	3	-
Target Level	3	3	2.4	1	-	-	-	-	-	-	1	-	3	-

Session: 2021-22 **Semester: 6th**

Subject Name (Code): Microprocessor & Microcontroller (KEE-602)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the basic architecture of 8085 & 8086 microprocessors .	2	C
2	Illustrate the programming model of microprocessors using 8085 microprocessor.	2	C
3	Illustrate the interfacing of different external peripheral devices with 8085 microprocessor.	2	C
4	Understand the architecture of 8051 microcontroller.	2	C
5	Illustrate advance level microprocessor & microcontroller for different applications	2	C

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: 2021-22 **Semester: 6th**

Subject Name (Code): Power Electronics (KEE-603)

S No.	Course Outcomes	BL	KL
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	C
2	Analyze the non-isolated DC-DC converters and identify their use in different Power electronics applications.	3	P
3	Evaluate the performance parameters of phase controlled rectifiers	5	P
4	Analyze single-phase ac voltage controllers, cyclo-converters and their various applications	4	P
5	Analyze the single-phase and three phase bridge inverters, Voltage source inverters and current source inverters	6	P

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: 2021-22 **Semester: 6th**

Subject Name (Code): Special Electrical Machines (KEE-061)

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

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: 2021-22 **Semester: 6th**
Subject Name (Code): Basics of Data Base Management (KOE-067)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Describe the features of a database system and its application and compare various types of data models.	2	C
2	Construct an ER Model for a given problem and transform it into a relation database schema.	6	C
3	Formulate solution to a query problem using SQL Commands, relational algebra, tuple calculus and domain calculus.	6	P
4	Explain the need of normalization and normalize a given relation to the desired normal form.	3	P
5	Explain different approaches of transaction processing and concurrency control.	2	M

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		1	2		1
CO-2	2	1	3	2	3	-	-	1	-	3	2	1	3	2
CO-3	3	-	-	-	3	-	-	1	-	1	1	1	3	1
CO-4	2	3	-	3	-	-	-	1	-			1	2	1
CO-5	2	3	-	3	-	-	-	1	-			1	1	2
Target Level	2.4	2.33	3	2.66	3	-	-	1	1	2	1.33	1.2	2.25	1.4

Session: 2021-22 **Semester: 6th**

Subject Name (Code): Linear Integrated Circuits (KEN-061)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Analyze integrated circuit designed by BJT.	3	C
2	Develop the higher order filters with Op-Amp.	6	C,P
3	Use the CMOS to make digital integrated circuits	2	C
4	Comprehend the non-linear application of Op-Amp	5	C
5	Understand the 555 Timer and PLL.	3	C

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	2
CO-2	3	3	2	3	3	1	-	-	-	2	1	2	3	2
CO-3	3	3	1	2	2	1	-	-	-	2	1	2	2	3
CO-4	3	3	2	3	3	1	-	-	-	2	2	2	2	3
CO-5	3	3	1	2	2	2	-	-	-	2	2	3	3	1
Target Level	3	3	1.4	2.4	2.40	1.25	-	-	-	2	1.5	2.20	2.4	2.2

Session: 2021-22 **Semester: 6th**

Subject Name (Code): Understanding the Human Being Comprehensively (KOE-069)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the comprehensive human goal of life.	2	F,C
2	Understand the harmony of nature and existence.	2	F,C
3	Analyze the activities of self in its completeness.	4	F,C,P
4	Analyze the coexistence in all four orders of nature.	4	F,C,P
5	Analyze the human traditions from self to entire existence.	4	F,C,P

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: 2021-22 **Semester: 6th**

Subject Name (Code): Power System-II Lab (KEE-651)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Compare the different performance characteristics of various relays including data provided by manufacturers.	5	P
2	Develop programs for load-flow solutions using NR and GS methods.	6	P
3	Develop programs for various types of faults in power network.	6	P
4	Demonstrate different numerical integration methods and factors influencing transient stability.	3	P
5	Determine the effect of load in long transmission line.	3	C

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	-	-	3	-
CO-2	3	3	3	2	3	-	-	-	2	1	-	-	3	-
CO-3	3	3	3	2	3	-	-	-	2	1	-	-	3	-
CO-4	3	3	2	2	2	-	-	-	2	1	-	-	3	-
CO-5	3	3	2	2	-	-	-	-	2	1	-	-	3	-
Target Level	3	3	2.6	2	2.6	-	-	-	2	1	-	-	3	-

Session: 2021-22 **Semester: 6th**

Subject Name (Code): Microprocessor & Microcontroller Lab (KEE-652)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the microprocessor system.	2	C
2	Apply the concept of flow chart for understanding the data flow.	3	P
3	Apply the concept of assembly language to program microprocessor-based system.	3	P
4	Interfacing different peripheral devices with the microprocessor.	4	P
5	Analyze and Building logic for microprocessor-based system.	4	P

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	2	2
CO-2	3	1	2	1	1	-	-	-	2	-	-	1	2	2
CO-3	3	2	2	1	1	-	-	-	2	-	-	1	2	2
CO-4	3	3	2	2	1	-	-	-	2	-	-	1	2	2
CO-5	3	3	2	2	1	-	-	-	2	-	-	1	2	2
Target Level	2.8	2.25	2	1.5	1	-	-	-	2	-	-	1	2	2

Session: 2021-22 **Semester: 6th**

Subject Name (Code): Power Electronics Lab (KEE-653)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Investigate and simulate rectifier circuit	4	P
2	Investigate and simulate inverter circuit	4	P
3	Investigate and simulate chopper circuit	4	P
4	Investigate and simulate cycloconverter	4	P
5	Investigate and simulate rectifier circuit	4	P

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	3	3	2	2	2	2	2	2	2	2	2	2
CO-2	2	3	2	2	2	2	2	2	2	2	2	2	2	2
CO-3	3	3	3	2	3	2	2	2	2	3	2	2	3	2
CO-4	3	3	3	2	2	2	2	2	3	2	2	2	2	2
CO-5	2	3	3	3	2	2	2	2	2	2	2	2	2	2
Target Level	2.5	3	2.75	2.25	2.25	2	2	2	2.25	2.25	2	2	2.25	2

Session: 2021-22 **Semester: 7th**

Subject Name (Code): Rural Development: Administration and Planning (KHU-701)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the concepts , basics and importance of rural development	2	C
2	Explain pre and post-independence rural development programs.	2	P
3	Understand the importance, structure, significance of Panchayati raj and rural administration.	2	C
4	Acquire the knowledge about the need and importance of human resource development in rural sector .	2	C
5	Examine the importance of rural industrialization and entrepreneurship	3	P

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	-	-
CO-2	-	-	-	-	-	1	1	1	-	-	-	1	-	-
CO-3	-	-	-	-	-	1	1	1	-	-	-	1	-	-
CO-4	-	-	-	-	-	2	3	2	2	-	-	2	-	-
CO-5	-	-	-	-	-	2	3	2	2	-	1	2	-	-
Target Level	-	-	-	-	-	1.6	2	1.6	2	-	1	1.6	-	-

Session: 2021-22 **Semester: 7th**

Subject Name (Code): Energy Conservation and Auditing (KEE-071)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Analyze the energy conservation/saving opportunities in different electric system and understand related legislations.	4	P
2	Evaluate the energy saving behavior of utilities through implementation of DSM and EMIS	5	P
3	Analyze energy audit & management and to prepare energy audit report for different energy conservation instances	4	P
4	Apply the energy audit for Mechanical Utilities.	3	P
5	Evaluate cost-effective measures towards improving energy efficiency and energy conservation by implementation of energy efficient technologies	5	P

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	2	-
CO-2	3	3	3	2	2	-	-	-	-	-	-	1	2	-
CO-3	3	3	3	2	2	-	-	-	-	-	-	1	2	-
CO-4	3	3	3	2	2	-	-	-	-	-	-	1	2	-
CO-5	3	3	3	2	2	-	-	-	-	-	-	1	2	-
Target Level	3	3	3	2	2	-	-	-	-	-	-	1	2	-

Session: 2021-22 **Semester: 7th**

Subject Name (Code): Power Quality & FACTS (KOE-074)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the power quality issues in electrical distribution network	2	C
2	Analyze the sources of voltage sag and protective devices including voltage regulators, active series compensator and UPS.	2	P
3	Analyze the different phenomenon causing electrical transients and devices for over voltage protection.	2	P
4	Analyze the working and application of different type of FACT devices like SSC, SVC, TSC, SSS, TCSC, and UPFC.	2	M
5	Analyze the causes of harmonics, its effect on motor, capacitor, cables and mitigation techniques.	2	M

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	1	1	-	-	-	-	1	1	-	2	-
CO-2	3	2	1	2	1	-	-	-	-	1	1	-	2	-
CO-3	3	2	2	1	1	-	-	-	-	1	3	-	2	-
CO-4	3	3	3	3	1	-	-	-	-	2	3	-	2	-
CO-5	3	1	2	2	1	-	-	-	-	2	2	-	2	-
Target Level	3	1.8	1.8	1.8	1	-	-	-	-	1.4	2	-	2	-

Session: 2021-22 **Semester: 7th**

Subject Name (Code): Electric & Hybrid Vehicles (KEN-071)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Explain the basics of electric and hybrid electric vehicles, their architecture, technologies and fundamentals.	2	P
2	Explain plug – in hybrid electric vehicle architecture, design and component sizing and the power electronics devices used in hybrid electric vehicles.	2	P
3	Analyze various electric drives suitable for hybrid electric vehicles	4	P
4	Discuss different energy storage technologies used for hybrid electric vehicles and their control	2	C
5	Demonstrate different configurations of electric vehicles and its components, hybrid vehicle configuration by different techniques, sizing of components and design optimization and energy management	2	C

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	2	1	1	1	1	2	3	2	3
CO-2	3	3	2	2	3	3	1	1	1	1	2	2	3	3
CO-3	3	3	2	2	2	3	1	1	1	1	2	2	3	3
CO-4	3	3	3	2	3	3	1	1	1	1	2	3	3	3
CO-5	3	3	3	3	3	3	1	1	1	2	1	2	3	3
Target Level	3	3	2.4	2.2	2.8	2.8	1	1	1	1.2	1.8	2.4	2.8	3

Session: 2021-22 **Semester: 7th**

Subject Name (Code): Power System Protection (KEE-077)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the need for the protection of electric equipment and their protection schemes.	2	C
2	Describe different types of relays used for power system protectionand its application	2	P
3	Identify the appropriate protection schemes for transmission line protection along with the concept of auto reclosing.	1	C
4	Understand the concept of arc extinction theories of circuit breakers and CB testing methods	2	C
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	P

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	1	2	1	1.6	1.6	-	-	-	-	-	2	1.6	-

Session: 2021-22 **Semester: 7th**

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

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

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	2.20	2.00	2.00	2.00	-	-	-	-	2.00	2.00	1.50	-

Session: 2021-22 **Semester: 7th**

Subject Name (Code): Renewable Energy Resources (KOE-074)

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

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: 2021-22 **Semester: 7th**

Subject Name (Code): Vision for Humane Society (KOE-076)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Analyze the human aspirations, its fulfillment and need of universal human order.	4	F,C
2	Analyze the types of Human-Human relationship & its fulfillment.	4	F,C,P
3	Analyze justice from family to world family order.	4	F,C
4	Analyze the conceptual framework of undivided society as well as universal human order.	4	F,C
5	Analyze the transition from current state to the undivided society and universal human order.	4	F,C

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: 2021-22 **Semester: 7th**

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

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

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	3.00	3.00	3.00	3.00	1	1	-	2.00	3.00	3.00	3.00	3.00	3.00

Session: 2021-22 **Semester: 7th**

Subject Name (Code): Mini Project or Internship Assessment (KEN 752)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand research papers for exploring new fields and review reporting.	2	C
2	Evaluate new directions of various cutting-edge technologies.	5	P
3	Create various skills by preparing detailed project report including all the findings.	6	C, P
4	Effective communication by making an oral presentation to show the findings.	3	P
5	Create facts related knowledge by preparing detailed report including outcomes.	6	C, P

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: 2021-22 **Semester: 7th**

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

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

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: 2021-22 **Semester: 8th**

Subject Name (Code): Project Management & Entrepreneurship (KHU 802)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand entrepreneurship: need, scope, entrepreneurial competencies & traits.	2	C
2	Understand entrepreneurial Idea and Innovation.	2	P
3	Analyze project management and preparation of a real time project feasibility report containing Technical appraisal.	4	P
4	Analyze project financing and risk & uncertainty in project evaluation.	4	P
5	Evaluate social sector perspectives and social entrepreneurship opportunities.	5	M

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	3	2	1	1
CO-2	2	2	1	1	1	1	-	-	1	2	3	2	1	1
CO-3	2	2	1	1	1	1	-	-	1	2	3	2	1	1
CO-4	2	2	1	1	1	1	-	-	1	2	3	2	1	1
CO-5	2	2	1	1	1	1	-	-	1	2	3	2	1	1
Target Level	2	2	1	1	1	1	-	-	1	2	3	2	1	1

Session: 2021-22 **Semester: 8th**

Subject Name (Code): Entrepreneurship Development (KOE-083)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the growth and role of small-scale industries in the national economy, demand-based and resources, stages in starting a small-scale industry	2	C
2	Apply for assessment of the viability, formulation, evaluation, financing, field study, demand analysis, material balance, output methods, benefit-cost analysis.	3	P
3	Analyze the preparation of balance sheets and assessment of economic viability, decision making, expected costs wages and incentive, inventory control, preparation of financial reports	4	P
4	Understand the financial functions, cost of capital approach in project planning, risk analysis, capital expenditures profit planning, control of financial flows.	2	C
5	Analyze the laws concerning entrepreneur viz, partnership laws, business ownership, sales, income taxes, and workman compensation act.	4	P

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	1	2	3	3	2	2	1
CO-2	3	3	3	3	3	3	3	1	2	3	3	2	2	1
CO-3	3	3	3	3	3	3	3	1	2	3	3	2	2	1
CO-4	3	3	3	3	3	3	3	1	2	3	3	2	2	1
CO-5	3	3	3	3	3	3	3	1	2	3	3	2	2	1
Target Level	3	3	3	3	3	3	3	1	2	3	3	2	2	1

Session: 2021-22 **Semester: 8th**

Subject Name (Code): Introduction to Smart Grid (koe-084)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the basic concepts, definitions, functions and opportunities of Smart Grid.	2	C
2	Analyze Smart Meters, AMR, Hybrid Vehicles, V2G and Automation.	4	P
3	Evaluate the concept of various Smart Grid Technologies.	5	M
4	Evaluate the concept of Microgrid and Distributed Energy Resources.	5	M
5	Evaluate Power Quality issues and Management in Smart Grid.	5	M

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	-	1	-	-	2	2	3	1	2
CO-2	3	3	2	3	3	-	2	-	-	3	2	3	3	3
CO-3	2	3	3	3	2	-	2	-	-	2	3	3	2	2
CO-4	3	3	3	2	3	-	2	-	-	3	3	3	3	3
CO-5	3	3	3	3	3	-	2	-	-	3	3	3	3	3
Target Level	2.6	3	2.6	2.8	2.6	-	1.8	-	-	2.6	2.6	3	2.4	2.6

Session: 2021-22 **Semester: 8th**

Subject Name (Code): Automation & Robotics (KOE-091)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Learn the basic terminology used in Automation.	2	P
2	Learn the basic terminology used in Manufacturing Automation.	3	P
3	Learn the basic terminology used in robotics.	3	P
4	Classify the types of robotic grippers used in automation industries.	2	P
5	Realization of robotic sensoric systems and their interfacing with robot controllers.	3	P

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	1	1	-	-	2	-	-	-	-	1	-	-
CO-2	3	3	2	1	-	2	3	-	-	1	2	2	-	-
CO-3	3	1	2	1	-	-	3	-	-	-	-	2	-	-
CO-4	1	2	1	1	-	-	2	-	-	-	-	1	-	-
CO-5	3	3	3	2	2	2	3	-	1	2	3	3	-	-
Target Level	2.4	2	1.8	1.1	2	2	2.6	-	1	1.5	2.5	1.8	-	-

Session: 2021-22 **Semester: 8th**

Subject Name (Code): Human Values in Vedic Darsana (KOE-099)

S No.	Course Outcomes	BL	KL
Student will be able to:			
1	Understand the need and importance of Vedic Literature with Nyay Darsana	2	F,C,P
2	Understand the basics of Vaisesika Darsana	2	F,C,P
3	Understand the philosophy of spirituality with Samkhya & Yoga Darsana	2	F,C,P
4	Understand the philosophy of the God with the Upanisad & the Vedant Darsana	2	F,C,P
5	Understand the purpose and program for a human being based on Vedic Darsana.	2	F,C,P

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: 2021-22 **Semester: 8th**

Subject Name (Code): Project-2 (KEN-753)

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

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

The End