



Koneru Lakshmaiah Education Foundation

(Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

Accredited by NAAC as 'A++' Grade University ♦ Approved by AICTE ♦ ISO 9001-2015 Certified

Campus: Green Fields, Vaddeswaram - 522 502, Guntur District, Andhra Pradesh, INDIA.

Phone No. 0863 - 2399999; www.klef.ac.in; www.klef.edu.in; www.kluniversity.in

Admin Off: 29-36-38, Museum Road, Governorpet, Vijayawada - 520 002. Ph: +91 - 866 -2577715, Fax: +91-866-2577717.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING PROGRAM DEVELOPMENT DOCUMENT B. Tech, 2020-21

Vision of University:

To be a globally renowned university.

Mission of University:

To impart quality higher education and to undertake research and extension with emphasis on application and innovation that cater to the emerging societal needs through all-round development of students of all sections enabling them to be globally competitive and socially responsible citizens with intrinsic values.

Vision of Department:

To produce globally renowned leaders in academics, extension activities, research and technology development in frontier areas of Electronics and Electrical Engineering and allied fields.

Mission of Department:

To produce quality electrical and electronics engineers with abundant theoretical foundation, innovative thinking, and accurate design experience, exposure to research and development and awareness of social / sociological needs.

Program Educational Objectives

PEO-1: Acquiring engineering knowledge in a wide range of industrial, societal and real world applications

PEO-2: Pursuing advanced education, research and development, and other creative and innovative efforts in science, engineering, and technology, as well as other professional careers

PEO-3: Managing themselves in a committed professional and ethical manner

PEO-4: Participate as leaders in their fields of expertise and in activities that support service and economic development throughout the world.



Mission statements:

M1: Training the leaders of future

M2: Training the innovators of coming days

M3: Training the outstanding career professionals of future

M4: Conducting fundamental research

Academic Goals:

G1: To offer academic flexibility by means of Choice based credit systems and the like.

G2: To identify and introduce new specializations and offer programs in emerging areas therein

G3: To incorporate into the curriculum the Application orientation and use high standards of competence for academic delivery

G4: To design and implement educational system adhering to outcome based International models.

G5: To introduce and implement innovation in teaching and learning process to strengthen academic delivery

G6: To offer academic programs at UG, PG, doctoral, Post-Doctoral which are industry focused, and incorporates Trans-discipline, inter-discipline aspects of the education system

G7: To deliver higher education that includes technologies and meeting the global requirements

Program Outcome (POs)

PO-1: Ability to apply knowledge of mathematics, science, engineering fundamentals and engineering specialization for the solution of complex engineering problems.

PO-2: Ability to identify, formulate, research literature, analyze complex engineering problems using first principles of mathematics, natural sciences and engineering sciences.

PO-3: Ability to find solutions for complex engineering problems and system component of processes that meet the specified needs considering public health, safety and cultural, societal & environment.



PO-4: Ability to use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to obtain solutions to critical engineering problems.

PO-5: Ability to create, select and apply appropriate techniques, resources and modern engineering activities, with an understanding of the limitations.

PO-6: Ability to apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7: Ability to demonstrate the knowledge of engineering solutions, contemporary issues understanding their impacts on societal and environmental contexts, leading towards sustainable development.

PO-8: Ability to apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO-9: Ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO-10: Ability to communicate effectively verbal, written reports and graphical forms on complex engineering activities.

PO-11: Ability to demonstrate knowledge and understanding of the engineering and management principles and apply those one's own work, as a member and leader in team, to manage projects and in multi-disciplinary environments.

PO-12: Ability to recognize the need and having the preparation and ability to engage independent and life-long learning in the broadest context of technological change.

Program Specific Outcome's:

PSO-1: Ability to demonstrate the knowledge, skill to analyze the cause and effect on Electrical system, processes and systems

PSO-2: Ability to apply the acquired Electrical Engineering knowledge for the advancement of society and self



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Mapping of PEOs with GOALS:

PEOs	Academic Goals						
	G1	G2	G3	G4	G5	G6	G7
PEO-1				✓	✓		✓
PEO-2		✓				✓	✓
PEO-3				✓	✓		
PEO-4	✓	✓	✓			✓	

MAPPING OF PEOs with MISSION OF THE DEPARTMENT:

S. No	Description of PEOs	Key Components of Mission			
		M 1	M 2	M 3	M 4
		Training the leaders of tomorrow	Training the innovators of tomorrow	Training the outstanding career professionals of tomorrow	Conducting fundamental research
PEO-1	Acquiring engineering knowledge in a wide range of industrial, societal and real world applications	.	. ✓	. ✓	
PEO-2	Pursuing advanced education, research and development, and other creative and innovative efforts in science, engineering, and technology, as well as other professional careers		✓		✓
PEO-3	Managing themselves in a committed professional and ethical manner	✓			
PEO-4	Participate as leaders in their fields of expertise and in activities that support service and economic development throughout the world.	✓		✓	✓



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MAPPING OF POs/PSOs with PEOs:

S No.	Key Components of POs and PSOs	Description of PEO			
		Acquiring engineering knowledge in a wide range of industrial, societal and real world applications	Pursuing advanced education, research and development, and other creative and innovative efforts in science, engineering, and technology, as well as other professional careers	Managing themselves in a committed professional and ethical manner	Participate as leaders in their fields of expertise and in activities that support service and economic development throughout the world.
		PEO 1	PEO 2	PEO 3	PEO 4
PO1	Engineering knowledge	✓	✓		✓
PO2	Problem analysis	✓	✓		✓
PO3	Design/development of solutions	✓	✓		✓
PO4	Conduct investigations of complex problems	✓	✓		✓
PO5	Modern tool usage	✓	✓		✓
PO6	The engineer and society	✓	✓	✓	✓
PO7	Environment and sustainability	✓	✓	✓	✓
PO8	Ethics	✓	✓	✓	✓
PO9	Individual and team work	✓	✓	✓	✓
PO10	Communication	✓	✓	✓	✓



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PO11	Project management and finance				✓
PO12	Lifelong learning	✓	✓	✓	✓
PSO1	Ability to demonstrate the knowledge, skill to analyze the cause and effect on Electrical system, processes and systems	✓	✓		✓
PSO2	Ability to apply the acquired Electrical Engineering knowledge for the advancement of society and self	✓	✓		✓



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MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES (POs) and PROGRAM SPECIFIC OUTCOMES (PSOs)

Course Code	Course Title	CO NO	Description of the Course Outcome	Program Outcomes												PSO	
				1	2	3	4	5	6	7	8	9	10	11	12	1	2
20UC1101	INTEGRATED PROFESSIONAL ENGLISH	CO1	Understand the concepts of grammar to improve communication, reading, and writing skills										1				
		CO2	Demonstrate required knowledge over Dos and Don'ts of speaking in the corporate context. Demonstrate ability to face formal situations / interactions.									1					
		CO3	Understand the varieties of reading and comprehend the tone and style of the author. Skim and scan effectively and appreciate rhetorical devices									1					
		CO4	Apply the concepts of writing to draft corporate letters, emails, and memos										1				
20UC1202	ENGLISH PROFICIENCY	CO1	Demonstrating different interpersonal skills for employability								1						
		CO2	Distinguishing business essential skills									1					

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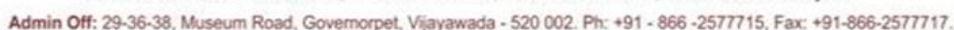
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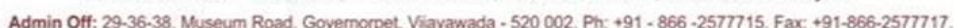
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20MT1101	MATHEMATICS FOR COMPUTING	CO1	Model a system of equations for real world applications in engineering, physical and biological sciences, computer science, finance, economics and solve them through matrix algebra	2															
		CO2	Model basic and computational techniques on discrete structures like relations, orders, functions & FSM, Lattices, and propositional & predicate logic	2															
		CO3	Model real world structures and their related applications using advanced discrete structures like graphs and trees.	2															
		CO4	Model the given Statistical data for real world applications in Engineering science, Economics and Management.	2															
		CO5	Demonstrate the Aptitude and Reasoning skills (Tests in skilling hours)	1															
20SC1102	INTRODUCTION TO DESIGN	CO1	Be able to understand elements and principles of design			1								1					

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			various periodic and aperiodic waveforms																
		CO3	Apply Laplace transforms and its properties to various signals	2															
		CO4	Apply Z transforms and its properties to various signals	2															
20SC1203	USER CENTRIC DESIGN TECHNIQUES	CO1	Understand the different roles and responsibilities in phases of User centered Design			1						1							
		CO2	Identify user pain points and opportunity areas through empathy and collaborative design			1						1							
		CO3	To be able to design a better User Experience using UCD and 6D process			2						2							
20SC2104	DESIGN THINKING AND INNOVATION	CO1	Understand the basics of design thinking and its implications in product or service development	1															
		CO2	Understand and Analyze the requirements of a typical problem		2														
		CO3	Plan the necessary activities towards solving the problem through ideation and prototyping				2	2						2					
		CO4	evaluate the solution and refine them based on the			3						3							

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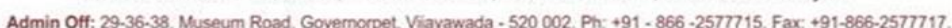
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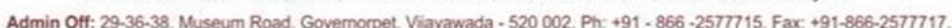
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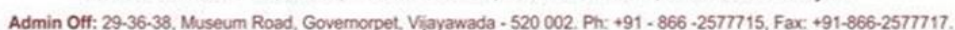
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		CO2	Implementing Array through NumPy, Plotting, Visualization through matplotlib and Numerical Methods														2			
		CO3	Implementing OOPS through Python, Data Structures through OOPS, Sci Py, Scikit-Learn, Pandas Libraries														2			
		CO4	Analyse real world applications in Energy management, Electric drives, smart grid and automation using machine learning algorithms with Python														2			
20TS3202 E	Technical Proficiency - 2 / Technopreneurship	CO1	Develop schematic and panel drawings for electrical control systems using AutoCAD Electrical.														2			
		CO2	Analyze various power system scenarios using modelling and analysis software.														2			
		CO3	Apply Sensor Selection and integration to Real-Time IoT Applications using Raspberry Pi.														2			

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

B.Tech EEE (Y20 Regulation) Program Articulation Matrix

S.No.	Course code	Course Name	Course category	L	T	P	S	Cr	Pre-Req.	PO												PSO	
										1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	20UC1101	Integrated Professional English	HSS	0	0	4	0	2	NIL								1	1	2				
2	20UC1202	English Proficiency	HSS	0	0	4	0	2	NIL							1	1		1	2			
3	20UC2103	Professional Communication Skills	HSS	0	0	4	0	2	NIL	1			1							1			
4	20UC2204	Corporate Communication Skills	HSS	0	0	4	0	2	NIL	1			1							1			
5	20UC3005	Aptitude Builder	HSS	0	0	4	0	2	NIL	1			1							1			
6	20UC0007	Indian Heritage and Culture	HSS	2	0	0	0	0	NIL	1													
7	20UC0008	Indian Constitution	HSS	2	0	0	0	0	NIL												1		
8	20UC0009	Ecology & Environment	HSS	2	0	0	0	0	NIL						2						1		
9	20UC0010	Universal Human Values & Professional Ethics	HSS	2	0	0	0	0	NIL								2						
10	20UC0011	Entrepreneurship	HSS	2	0	0	0	0	NIL										1	2			

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23	20EE2104	Matemactical transforms for Signal Processing	ES	2	1	0	0	3	NIL	3													
24	20EE1201	Basics of Electrical & Electronics Engineering	ES	2	1	0	0	3	NIL	1	2												
25	20EE2101	Electrical Circuits	ES	3	1	0	0	4	NIL	2			2										
26	20EC1101	Digital Logic & Processors	ES	3	0	2	0	4	NIL	2	2		2										
27	20SC2103	Object oriented programming	ES	3	0	2	3	5	NIL	2	2												
28	19EC1202	Computer Organization & Architecture	PC	2	0	0	0	2	NIL	2	2											2	2
29	19EC2103	Analog Electronics Circuit Design	PC	3	0	2	2	5	Nil	1	2	1										2	1
30	19EC2106	Embedded Controlllers	PC	2	0	3	2	4	Nil		2	3	2										
31	19EE2102	Electrical Power Engineering	PC	3	1	0	0	4	Nil	3		2										3	
32	19EE2103	Electrical Machines	PC	3	0	2	0	4	Nil	2	2		3									3	
33	19EE2201	Industrial Applications of Electrical Machines	PC	3	0	2	0	4	19EE2103	2			3	3								2	
34	19EE2202	Power Electronics	PC	3	0	2	2	5	20EE1201	2		3	3			3					2	3	2



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35	19EE2203	Computer Applications in Power Systems	PC	3	0	2	0	4	19EE2102	2					3								3	
36	19EE2204	Control Systems	PC	3	0	2	2	5	Nil	3	3			3									3	2
37	20EE3101	AI TECHNIQUES IN ELECTRICAL ENGINEERING	FC	3	1	0	0	4	19EE2203	2			2	2							3	3		3
38	20EE3102	ELECTRIC DRIVES	FC	3	1	0	0	4	19EE2202	1	3			2									1	
39	20EE3103	RESTRUCTURED POWER SYSTEMS	FC	3	1	0	0	4	19EE2102	1				3									2	
40	20EE3104	Power Quality	FC	4	0	0	0	4	Nil	2	3		2	3									2	
41	20EE3105	UTILISATION OF ELECTRICAL ENERGY	FC	3	1	0	0	4	Nil	2							3						3	1
42	20EE3206	SENSORS AND INTERNET OF THINGS	FC	3	0	2	0	4	Nil	1	1			2								2	1	2
43	19EE3121	SOLAR AND MICRO ENERGY TECHNOLOGIES	PE	3	0	0	0	3	NIL	2				2									1	
44	19EE3122	WIND AND ENERGY STORAGE TECHNOLOGIES	PE	3	0	0	0	3	NIL	1	3												2	
45	19EE3123	ENERGY MANAGEMENT AND GREEN BUILDINGS	PE	3	0	0	0	3	NIL		2					2						3	2	1



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46	20EE3221	AI AND IOT FOR GREEN ENERGY INTEGRATION	PE	3	0	0	0	3	NIL			2		1						1	2	1
47	20EE3222	GRID INTEGRATION OF RENEWABLE ENERGY SOURCES	PE	3	0	0	0	3	NIL					1		2					3	
48	19EE3141	POWER TRAIN DESIGN FOR ELECTRIC VEHICLE	PE	3	0	0	0	3	19EE2103						2	3					1	2
49	19EE3142	BATTERY STATE ESTIMATION ALGORITHMS FOR ELECTRIC VEHICLE	PE	3	0	0	0	3	NIL	1				2		2					1	2
50	19EE3143	CHARGING STATIONS FOR ELECTRIC VEHICLES	PE	3	0	0	0	3	19EE2202					2		1					1	2
51	20EE3241	AI AND IOT FOR ELECTRIC VEHICLE	PE	3	0	0	0	3	NIL			2		1	2						1	2
52	20EE3242	COMMUNICATION PROTOCOLS & TESTING OF EV	PE	3	0	0	0	3	NIL			2		1							1	2



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53	19EE3111	INDUSTRIAL AUTOMATION AND ROBOTICS	PE	3	0	0	0	3	NIL	1												2
54	19EE3112	INTRODUCTION TO INDUSTRIAL INTERNET OF THINGS	PE	3	0	0	0	3	NIL	1												2
55	19EE3113	INDUSTRIAL DRIVES AND CONTROL	PE	3	0	0	0	3	19EE2103	1												1
56	20EE3211	INDUSTRIAL COMMUNICATION PROTOCOLS AND CYBER SECURITY	PE	3	0	0	0	3	NIL	1					1							2
57	20EE3212	SMART SENSORS AND SMART NETWORKING	PE	3	0	0	0	3	NIL	1		1		1								
58	19EE3131	DISTRIBUTION SYSTEM PRACTICES	PE	3	0	0	0	3	19EE2102	2												2
59	19EE3132	DISTRIBUTED ENERGY RESOURCES AND SMART GRIDS	PE	3	0	0	0	3	NIL		2	1		2								1 2
60	19EE3133	ENERGY MANAGEMENT SYSTEMS AND SCADA	PE	3	0	0	0	3	NIL	1				2								1 2



61	20EE3231	SMART GRID COMMUNICATION AND CYBERSECURITY	PE	3	0	0	0	3	NIL	1				2							2	
62	20EE3232	INTERNET OF THINGS AND SMART GRID ANALYTICS	PE	3	0	0	0	3	NIL	1				2							1	2
63	20MB4051	Modelling Business Systems	ME	2	0	0	0	2	Nil					1				3	2		1	
64	20MB4052	Entrepreneurship Essentials	ME	2	0	0	0	2	Nil					1				3	2			1
65	20IE2050	Social internship	PR	0	0	0	8	2	NIL					1			2		2			3
66	20IE3050	Technical Internship	PR	0	0	0	8	2	NIL				3	1					2			2
67	20IE3150	Mid Grad Capstone Project – I	PR	0	0	0	8	2	NIL					2								
68	20IE3250	Mid Grad Capstone Project – II	PR	0	0	0	8	2	NIL					2								
69	20IE4150	Capstone Project – I	PR	0	0	0	24	6	NIL				2	3								2
70	20IE4250	Capstone Project – II	PR	0	0	0	24	6	NIL				2	3								2
71	19IE4050	Practice School	PR	0	0	0	24	6	NIL				2	3								2
72	19IE4051	Internship	PR	0	0	0	24	6	NIL				2	3								2



Koneru Lakshmaiah Education Foundation

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73	20TS3101	Technical Proficiency - 1 / Entrepreneurial Incubation	PTA	0	0	0	12	3	NIL		1	2		3								2
74	20TS3202	Technical Proficiency - 2 / Technopreneurship	PTA	0	0	0	12	3	NIL		1	2		3								2
75	20TS4103	Technical Proficiency - 3 / Entrepreneurial Skilling	PTA	0	0	0	12	0	NIL		1	2		3								2
76	20TS4204	Technical Proficiency - 4 / Entrepreneurial Skilling	PTA	0	0	0	12	0	NIL		1	2		3								2
77	19EE40A3	Renewable Energy Sources	OE	3	0	0	0	3	NIL					3	2							
78	19EE40A4	Energy Estimation & Audit	OE	3	0	0	0	3	NIL					3	2							

