

K L University

Department of Electronics and Communication Engineering

Academic Year 2016-17

Mapping of ECE Department Mission Statement with SOs, PSOs and PEOs

Student Outcomes

Mission statement of K L University:

Vision:

To be a globally renowned university.

Mission

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 and Mission statement of ECE department

VISION

- To evolve into a globally recognized department in the frontier areas of Electronics & Communication Engineering (ECE).

MISSION

M1- To produce graduates having professional excellence.

M2- To carry out quality research having social & industrial relevance.

M3- To provide technical support to budding entrepreneurs and existing Industries.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

- **PEO1:** Practice engineering in a broad range of industrial, societal and real world applications.
- **PEO2:** Pursue advanced education, research and development, and other creative and innovative efforts in science, engineering, and technology, as well as other professional careers.
- **PEO3:** Conduct themselves in a responsible, professional, and ethical manner.
- **PEO4:** Participate as leaders in their fields of expertise and in activities that support service and economic development throughout the world.

Student Outcomes

a	Ability to apply knowledge of mathematics, science, and engineering
b	Ability to design and conduct experiments, as well as to analyze and interpret data
c	Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d	Ability to function on multidisciplinary teams
e	Ability to identify, formulate, and solve engineering problems
f	Understanding of professional and ethical responsibility
g	Ability to communicate effectively
h	Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i	Recognition of the need for, and an ability to engage in life-long learning
j	Knowledge of contemporary issues
k	Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

PROGRAM SPECIFIC OBJECTIVES

PSO1	An ability to Understand the theoretical and mathematical concepts to analyze real time problems.
PSO2	An Ability to Design and Analyze systems based on the theoretical and Practical Knowledge

Mapping of Mission statements with program educational objectives

	M1	M2	M3
PEO1	✓	✓	✓
PEO2	✓	✓	✓
PEO3	✓		✓
PEO4	✓	✓	✓

Mapping of PEOs with SOs

	PEO1	PEO2	PEO3	PEO4
a	✓	✓		
b	✓	✓		
c	✓	✓		
d	✓	✓		✓
e	✓	✓		
f			✓	✓
g	✓	✓		✓
h		✓	✓	✓
i	✓		✓	✓
j	✓			✓
k	✓	✓		
PSO1	✓	✓		
PSO2	✓	✓		

S. No	Course code	Course Name	S NO	CO NO	Description of the Course Outcome	Mapping with SO											PSO 1	PSO 2	
						a	b	c	d	e	f	g	h	i	j	k			
HUMANITIES & SOCIAL SCIENCES																			
1	15 EN 1101	Rudiments of Communication Skills	1	1	Remember speech sounds and apply stress and intonation rules to enhance pronunciation skills.							1							
			2	2	Understand writing strategies and apply those by using the basic and advanced concepts of grammar.							1							
			3	3	Understand the types of texts and tone of the author.								1						
			4	4	Understand the importance of interpersonal skills								1						
2	15 EN 1202	Interpersonal Communication Skills	1	1	Understand the method of identifying the meaning of words from the context and form sentences using words.							1							
			2	2	Understand and analyze seven types of reading techniques and improve reading speed.								2						

			3	3	Understand and apply writing strategies for office/ formal communication.							2						
			4	4	Understand and analyze different cultures and the importance of empathy in cross-cultural communication.			1				1						
3	15 EN 2103	Professional Communication Skills	1	1	Understand the concept of Group Discussion and listen and speak effectively during the discussion.							1						
			2	2	Understand and improve learners' competency in competitive English and apply the principles of grammar in real life contexts.							2						
			3	3	Understand skimming & scanning, and apply the types of reasoning in comprehending the information.								3					
			4	4	Understand the mechanics and application of presentation skills.						1							
4	15 EN 2204	Employability Skills	1	1	Analyze one's own strength as a speaker/ Communicator and use discretion while listening.							2						
			2	2	Apply and analyze various concepts of writing							3						

				strategies in professional communication skills like, reports, resume and minutes of the meeting.															
			3	3	Understand the organization of the passage and also analyze the tone, attitude and style of the author.						2								
			4	4	Acquire knowledge of and apply people skills in various social organizational and corporate ambiances					2									
5	15 EN 3105	Verbal and Quantitative Reasoning	1	1	Understand the method of identifying synonyms and antonyms and analyze the meaning of a word from the context.								1						
			2	2	Analyze issues and arguments in the process of critical reasoning and apply grammar rules to correct sentences.								1						
			3	3	Apply the Concepts of basic Algebra and their importance while solving the problems									1					
			4	4	Apply the short-cut methods on the concepts of different models in Calendars, Clocks, Blood										1				

					perspective													
			4	4	Understand and analyze the possible career options in Engineering and develop strategic plan, career targets and mechanism to achieve the same.													
18 a	15 CS 1101	C Programming & Data Structures-1	1	1	Illustrate how problems are solved using computers and programming.	2				2					1		1	
			2	2	Illustrate and use Control Flow Statements in C.	2				2				1		1		
			3	3	Interpret & Illustrate user defined C functions and different operations on list of data.	2				2								
			4	4	Implement Linear Data Structures and compare them.	2	2			2								
			5	5	Apply the knowledge obtained by the course to solve real world problems.	2	2			2				1		1		
18 b	15 CS 1201	C Programming & Data Structures-2	1	1	Solve typical problems using computers and programming.	2				2							1	
			2	2	Apply linear Data Structures in solving problems.	2				2						1		
			3	3	Implement Non - Linear Data Structures.	2				2								
			4	4	Implement Height balanced trees &	2	2			2								

			4	4	Understand I/O Streams & apply and understand Basic Concepts of Multi -Threading													3				
			5	5	Apply OOP concepts for developing an application													3				
22	15 EC 2002	Signal Analysis	1	1	Demonstrate signals and their Spectra 2	2													1			
			2	2	Analyze discrete time systems	2														1		
			3	3	Design filters to cater signal analysis needs															2		2
			4	4	Analyze non stationary signals in time															2	1	
			5	5	Analyze non stationary signals in frequency domains													2	1			
23	15 CS 2003	Discrete Mathematics	1	1	Understand sets, relations, functions and discrete structures , Count discrete event occurrences	2														1		
			2	2	Apply Propositional logic and First order logic to solve problems	2															1	
			3	3	Formulate and solve recurrence relations, apply algebraic structures and lattices.															2	1	
			4	4	To identify the basic properties of graphs and trees and model simple applications															2	1	

2103	Circuit Design		and relate classroom learning with real life situation by taking into the consideration of various design concepts															
		2	2	Understanding the concepts of various diodes and their applications.			3									1	3	
		3	3	BJT concepts as operation, biasing and frequency response			3							3	1			
		4	4	FET concepts as operation, biasing and frequency response			3							3	1			
		5	5	Feedback concepts and their analysis			3							3	1			
		6	6	Concepts of various oscillators and applications.			3							3	1			
27	15 EM 2202	Processors and Controllers	1	1	Able to understand and analyze the architectural features of CISC type of General purpose processor Intel 8086 Microprocessor.				2						3	1		
			2	2	Able to understand and analyze the architectural features of CISC type of microcontroller - Intel 8051 Microcontroller.				2						3	1		
			3	3	Able to understand and analyze the architectural features of RISC type of microcontroller – PIC				2						3	1		

					Microcontroller.															
			4	4	Able to program 8086 microprocessor, 8051 and PIC microcontrollers in assembly language using TASM, KEIL, MPLAB and Proteus tools.				2							3	1			
			5	5	Able to Develop a real time application using 8051& PIC Microcontrollers through project based labs.				2							3	1			
28	15 EC 2204	Design with CPLD & FPGA	1	1	Study and design of combinational and sequential circuits using PLDs and state machines.			2										1		
			2	2	Understand Full-custom & Semi Custom design methodologies of for designing different PLD architectures.			2								2				
			3	3	To study PLD structures and design process			2												
			4	4	Study of different CPLD and FPGA architectures			2												
			5	5	To understand different physical process.			2								2				
29	15 EC 2205	Communicatio n Theory-1	1	1	have a good understanding of both time and frequency domain representations of signals;			2								2				
			2	2	have a good understanding of analog modulation			2							2	1				

					and demodulation techniques;													
			3	3	have a good understanding of digital modulation and demodulation techniques; and	2								2	1			
			4	4	Understanding pulse modulation systems	2								2	1			
			5	5	Understand and be able to implement noise and error analysis of an analogue system.	2								2	1			
			6	6	Understand and be able to implement noise and error analysis of an analogue or digital telecommunication system.	2								2	1	2		
30	15 EC 2206	Signal Processing	1	1	Understand various signals and model physical process using them.				2						2	3		
			2	2	Acquaint with various a transformation methods and their potential for applicability in various signal analysis conditions				2						1			
			3	3	Demonstrate sampling and its potential applications in communications, discrete signal acquisition etc.,.				2							1		
			4	4	Evaluate discrete system behavior and its response to facilitate system design.				2							1		

			5	5	Design a low pass discrete time system to meet noise elimination like applications					2						3	1		
			6	6	Analyze non stationary signals and analyze them in both time frequency domains.					2						3		2	
31	15 EE 2207	Control Systems	1	1	Students can be able to understand control system concepts such as open, closed loop systems, transfer function approach, mathematical modeling of physical systems and can understand analyze the similarities between synchros and ac generators					1							1		
			2	2	Students can be able to Analyze the time domain and frequency response of physical systems					2							1		
			3	3	Students can be able to understand and analyze stability of given transfer functions in time and Frequency domain and can be able to analyze the process of Converting state space equations into transfer function for the given model.					2								1	
			4	4	Students can be able to design and analyze controllers and lead, lag, lead-lag compensators					2						2	1		
			5	5	Test and apply the knowledge obtained in											2	1		

					the subject by Matlab or hardware.													
32	15 CS 2208	Computer Networks	1	1	Understand OSI and TCP/IP models											2	1	
			2	2	Analyze MAC layer protocols and LAN technologies				2									
			3	3	Implement routing and congestion control algorithms				2						2			
			4	4	Understand application layer concepts				2									
			5	5	Design applications using internet protocols										2			
33	15 EM 3103	Embedded Systems	1	1	Able to analyze embedded systems, analyze and program on chip peripherals for a single purpose controller			2								3		
			2	2	Able to interface and program different off chip peripherals and communication protocols used in embedded systems			2							3			
			3	3	Able to understand, evaluate and select appropriate software architectures			2							3			
			4	4	Able to analyze and design embedded systems using the features in real time operating systems.			2							3			

			5	5	Examine the microwave measurements using VNA and SA	2									2	1			
36	15 EC 3209	Communication Theory-3	1	1	Describe the types and advantages of spread spectrum modulation formats	2									2	1			
			2	2	Identify the radio signal propagation mechanism and different fading concepts	2									2	1			
			3	3	Illustrate the growth of communication satellites	2										1	1		
			4	4	Identify the different phases of cellular communication concepts	2											1	1	
			5	5	Understand the optical communication transmission media and principles of operation	2											1	1	
37	15 EC 4110	Digital Image Processing	1	1	Acquire the fundamental concepts of a digital image processing system	3											1		
			2	2	Identify and exploit analogies between the mathematical tools used for 1D and 2D signal analysis and processing by analysing 2D signals in the frequency domain through the Fourier transform	3										3	1		
			3	3	Design and implement with Matlab algorithms for digital image processing operations such as histogram equalization,	3										3	1		

					enhancement														
			4	4	Design and implement with Matlab algorithms such as restoration, filtering, and de-noising which develops an appreciation for the image processing issues.	3										3			2
			5	5	New techniques and be able to apply these techniques to real world problems.	3										3			2
Professional Electives					Communication stream														2
38	15 EC 3252	RF System Design	1	1	Differentiate different RF components and transmission lines							2	2						
			2	2	Demonstrate the smith chart applications, multiport networks							2	2			1			
			3	3	Design different RF-Filters based on stability and gain							2	2			1			
			4	4	Develop different types of RF amplifiers							2	2			1			
39	15 EC 4162	Radiation Systems	1	1	Demonstrate the radiation mechanism and antenna parameters							2							2
			2	2	Distinguish different types of radiation from apertures							2							
			3	3	Select the antennas and arrays based on the specific application							2							
			4	4	Evaluate the antenna performance with measurement techniques							2							

40	15 EC 4163	Radar and Navigational AIDS	1	1	Compare different types of radars and their limitations								2	2					
			2	2	Illustrate the operation of MTI Radar and types of tracking methods								2				1		
			3	3	Differentiate different radar transmitters and receivers									2	2			1	
			4	4	Compare different types of electronic counter measures									2	2			1	
41	15 EC 4164	Microwave and millimeter Wave Circuits	1	1	Differentiate different Microwave components									2			1		
			2	2	Identify transformers and microwave resonators									2	2		1		
			3	3	Design different microwave filters										2	2		1	
			4	4	Distinguish microwave and millimetric wave circuits										2	2			2
42	15 EC 4165	EMI/EMC	1	1	Describe the EMI specifications and standards									2			1		
			2	2	Demonstrate the EMI control techniques and design guidelines									2					
			3	3	Distinguish different passive components for EMC										2				
			4	4	Evaluate the EMI measurements using											2			

					different techniques															
43	15 EC 4166	Cellular Communicati ons	1	1	Demonstrate different wireless communication systems and radio propagation mechanism									2						
			2	2	Distinguish different equalizers and diversity techniques in propagation								2			2				
			3	3	Illustrate different wireless communication system standards												2	2		
			4	4	Select OFDM in the channel estimation and implementation												2	2		
44	15 EC 4167	Satellite Communicati ons	1	1	Demonstrate the basic concepts of satellite communication and orbital mechanics									2			2			
			2	2	Illustrate the satellite subsystems and link design								2			1				
			3	3	Interpret transmitters and receivers usage in tracking and error control mechanism								2			1				
			4	4	Develop the GPS based navigation system									2			1			
45	15 EC 4168	Optical Communicati on	1	1	Dramatize the importance of optical communication								2			1				
			2	2	Demonstrate the transmission characteristics of optical fibers, optical transmitters and								2							

					detectors														
			3	3	Illustrate the advanced optical fiber systems								2						
			4	4	Test the optical fiber transmission and reception mechanism									2					
46	15 EC 4169	Information Theory & Coding	1	1	Describe the basic terminology of information theory and coding								2						
			2	2	Demonstrate the encoding of the source output							2							
			3	3	Illustrate the importance of error control in coding							2							
			4	4	Distinguish different binary cyclic codes and convolution codes							2							
47	15 EC 4170	Software Defined Radio	1	1	Demonstrate the concept of Software defined radio								2						
			2	2	Describe the architecture of SDR							2							
			3	3	Illustrate the programming concept of SDR							2							
			4	4	Differentiate the segment design tradeoffs											1			
48	15 EC 4171	Fundamental s of Electronics Warfare	1	1	CO1 Distinguish different methods of warfare and target identification								2						
			2	2	Demonstrate the jamming techniques used in electronic warfare									2					

			3	3	Distinguish active jamming and passive jamming							2						
			4	4	Judge the false identification of targets and methods to overcome							2						
49	15 EC 4172	Electronic Navigation Systems	1	1	Differentiate different electronic navigational aids													
			2	2	Demonstrate the satellite navigation mechanism							2						
			3	3	Illustrate the working principle of GPS antenna system								2					
			4	4	Discriminate ship master compass and automatic steering techniques										2			
50	15 EC 4173	Radar	1	1	Demonstrate different types of radars								2					
			2	2	Illustrate the working principle of MTI radar and its tracking mechanism								2					
			3	3	Discriminate radar transmitters and receivers									2				
			4	4	Demonstrate basic principles synthetic aperture radar										2			
51	15 EC 4174	Computational Electromagn	1	1	Distinguish different computational techniques							2						

		etics	2	2	Illustration on FEM based methodology approach								2				
			3	3	Illustration on a one-dimensional introduction to the method of moments										1		
			4	4	Illustration on MOM based methodology approach										1		
					Signal Processing Stream												
52	15 EC 3253	Intelligent Systems and Control	1	1	To establish the theory necessary to understand and use of Intelligence in system control and related constructions.								2				
			2	2	To establish the theory necessary to understand the Biological foundations to intelligent systems							2					
			3	3	To emphasize on efficient algorithms for ANN based systems.							2					
			4	4	To emphasize on efficient algorithms for Fuzzy based systems.							2					
53	15 EC 4175	Adaptive signal Processing	1	1	To establish the theory necessary to understand and use of Adaptiveness in system control and related constructions.								2				
			2	2	To establish the theory necessary to understand theWiener filter, search methods and the LMS algorithm							2					
			3	3	To emphasize on efficient algorithms for									2			

					adaptive systems.													
			4	4	To emphasize on Vector space framework for optimal filtering											2		
54	15 EC 4176	Statistical Signal Processing	1	1	To establish the theory necessary to understand and use Statistics and related constructions.										2			
			2	2	To emphasize construction of efficient algorithms for real time applications.									2				
			3	3	To study applications in signal processing, communications. The course has computer and research projects involving independent study.										2			
			4	4	To study applications in sensing where statistics and probability play an important role.										2			
55	15 EC 4177	Speech Signal Processing	1	1	To establish the theory necessary to understand and use speech based systems and related constructions.									2				
			2	2	To emphasize on efficient algorithms for speech based systems.									2				
			3	3	To study applications in speech signal processing, speech based systems. The course has computer and research projects											1		

					involving independent study.														
			4	4	To study applications in speech sensing software in mobile.											1			
56	15 EC 4178	Multimedia Signal Processing	1	1	To establish the theory necessary to understand and use of multimedia in system control and related constructions.							2							
			2	2	To establish the theory necessary to understand and use of Motion Estimation						2								
			3	3	To emphasize on efficient algorithms for multimedia based systems.										2				
			4	4	To emphasize on Multimedia Content Representation and Retrieval											2			
57	15 EC 4179	Neural Networks and Fuzzy Control	1	1	To establish the theory necessary to understand and use of Intelligence in system control and related constructions.							2							
			2	2	To establish the theory necessary to understand and use of Back propagation networks in system control and related constructions.							2							
			3	3	To emphasize on efficient algorithms for ANN based systems.											2			

			4	4	To emphasize on efficient algorithms for Fuzzy based systems.										2				
					VLSI Stream														
58	15 EC 3251	Analog VLSI Design	1	1	Understand the functionality and Electrical Properties of MOS and BJT Devices										2				
			2	2	Analyzing and design of passive & active current mirrors								2	2					
			3	3	Analyze different active MOS loads and frequency responses									2	2				
			4	4	Study of the different amplifiers and feedback topologies										2				
59	15 EC 4154	Applications of MEMS Technology	1	1	Understand the basic concepts of MEMS technology and Micro system design										2				
			2	2	Analyze the fabrication process methods and micro system level packaging									2		1			
			3	3	Study of the switching devices for MEMS devices.										2		1		
			4	4	Study of the Actuation mechanisms for MEMS devices										2		1		
60	15 EC 4155	CAD for VLSI Design	1	1	Understand the VLSI design methodologies and design rules										2				
			2	2	Analyze the basic concept of floor planning,									2		2			

					routing and simulation														
			3	3	Study of the modeling process									2		2			
			4	4	Study of the synthesis process									2		2			
61	15 EC 4156	Design for Testability	1	1	Understand the basic concept reliability and modeling of faults as a requisite for achieving manufacturing quality of semiconductor devices and then identifies difficulties in VLSI testing									2					
			2	2	Analyze the fault tolerant system can be viewed as a design moving through different abstraction levels, a historical view of the development of VLSI system								2						
			3	3	Study of the test pattern generation for BIST architectures									2					
			4	4	Study of the specific BIST architectures										2				
62	15 EC 4157	Design of Semiconduct or Memories	1	1	Understand the basic semiconductor memories and memory technologies									2					
			2	2	Analyze the fault modeling, testing of Ics, memory reliability and radiation effects									2		1			
			3	3	Study of the advanced Memory Technologies										2		1		
			4	4	Study of the High-Density Memory										2		1		

					Packaging Technologies														
63	15 EC 4158	Low Power VLSI Design	1	1	Understand the sources of Power dissipation and approaches to minimize the power dissipation								2						
			2	2	Analyze the functionality of Analog and Digital power analysis							2							
			3	3	Study of the low power system, clock distribution							2							
			4	4	Study of the different Algorithms & Architectural Level Methodologies							2							
64	15 EC 4159	Nano Electronics	1	1	Understand the recent and past challenges of microelectronic devices								2		1				
			2	2	Analyze the Nano computer architectures and fabrication techniques							2		1					
			3	3	Study of the Ferro electric thin film properties and gas sensors							2		1					
			4	4	Study of the gas sensitive FETs							2		1					
65	15 EC 4160	VLSI Sub System Design	1	1	Understand the different design and programmable design techniques								2	2					
			2	2	Analyze the different memory and array subsystems							2	2						
			3	3	Study of the power and clock distribution							2	2						

					for systems														
			4	4	Study of the custom, cell based design methodologies							2	2						
66	15 EC 4161	VLSI Technology	1	1	Understand the basic fabrication process and maintenance of Clean Rooms and Wafer Cleaning process							2							
			2	2	Analyze the techniques to deposit various films by using Chemical Vapor Deposition							2	2						
			3	3	Analyze the techniques to deposit various films by using Physical Vapor Deposition and Multilevel Metallization Techniques								2	2					
			4	4	Study of the Rapid Thermal Processing Techniques and Etching Process								2	2					

Professor incharge

Head of the department