

K L University

Department of ECE

Academic Year 2015

Mapping of ECE Department M.Tech (CR) Mission Statement with POs, PSOs and PEOs

Program 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:** Apply concepts of Statistics, Linear Algebra and Residue Calculus in Communication, Signal processing and Electromagnetic domain.
- **PEO2:** Solve issues in real world communication sectors, and develop feasible and viable communication systems.
- **PEO3:** Inculcate effective communication skills, practice effective team work, professional ethics and pursue research.

Programe Outcomes

PO1	a	The courses expose students to a deep understanding of Channel Encoding and Decoding, Modulation and Demodulation, Radio Frequency Conversion, Channel Transmission, and performance extraction.
PO2	b	The course involves understanding of the physical issues in communications and its abstraction to mathematical models, followed by engineering approximation leading to a viable algorithm
PO3	c	The course involves mathematical modeling of communication events including noise, devices and systems that are different across various channels and hence is intensively problem oriented.
PO4	d	The approach in this course has been to provide a strong exposure to fundamentals with full mathematical rigor in Signal Processing, Communications and Electromagnetic followed by an exposure to specific courses in state of art in wireless, wire line and optical communications. This provides a strong background to engage in developments in these communication systems.
PO5	e	The student is exposed to Numerical and Algorithmic procedures in the theoretical courses with a strong lab component using Matlab environment, Embedded Environment and Electromagnetic Flow solver tools like HFSS and FEKO.
PO6	f	As a part of the mini project, major project or internship the student is exposed to interfacing for communications with real world sensors, transmission of speech and complex images from cameras all of which require multidisciplinary work.
PO7	g	Dev As a part of progress reports on mini and major projects the student is expected to develop his skills in written and oral presentation of the work that he has accomplished. Develop professional and ethical attitude and become socially responsible citizens.

PO8	h	Exposure to prerequisite math's and a mathematically rigorous approach to communication theory will provide him with all the necessary background to pursue a career in any field of communications going forward in his career.
PO9	i	In the individual lab assignments, mini project and major project tasks the student is exposed to thought provoking issues in communication system practice that need association of theoretical learning with real issues in a communication environment.

Mapping of Mission statements with program educational objectives

	M1	M2	M3
PEO1			✓
PEO2		✓	✓
PEO3	✓	✓	

Mapping of PEOs with Pos and PSOs

	PEO1	PEO2	PEO3
PO1	✓	✓	
PO2	✓	✓	
PO3	✓	✓	
PO4	✓		✓
PO5	✓		
PO6		✓	✓
PO7			✓
PO8	✓		
PO9	✓	✓	

MTech COMMUNICATION & RADAR [A.Y - 2015 - 2016]

S. N O	COURSE CODE	COURSE NAME	CO No	CO	1	2	3	4	5	6	7	8	9
1	15EC5101	Modern Digital Communication Techniques	1	Understand different modern digital modulation techniques and probability of error statistics.	1								
			2	Analyze the performance of baseband and pass band data transmission in terms of signaling schemes.	2								
			3	Understand the concepts of block and convolution codes with respect to transfer functions and decoding operations.	1								
			4	Analyze the spread spectrum signals and signal analysis for different digital communication technologies.			2						
			5	Interpret different digital communication modules with respect to signal analysis in application orientation.			2						
2	15EC5102	Microwave Antennas	1	Understand the basic antenna parameters and radiation mechanism for different types.	1								
			2	Identify the significance of aperture of antenna models and their feeding mechanism.		1							
			3	Design microstrip radiators with different shapes, slots and feeding techniques for communication applications.			3						
			4	Analyze the concepts of beam formation with respect to gain, directivity, impedance and polarization.	3								
			5	Estimate the performance characteristics of microwave antennas with the help of electromagnetic tools.			2						
3	15EC5103	EMI/EMC	1	Describe the concept of electromagnetic interference, compatibility and sources of EMI.	1								
			2	Understand the electromagnetic interference in circuits and measurement techniques with open area test sites.			1						
			3	Interpret the conducted and radiated interference and measurements.			2						
			4	Utilize the techniques like grounding, shielding, bonding and EMI filters in the usage of cables, connectors and components.			1						
4	15EC5104	Radar Engineering	1	Understand the concept of radar communication and its ground environment.	1								
			2	Analyze the transmitter characteristics like output power, spectrum analysis and harmonics from transmitter.	3								
			3	Identify the factors outside the radar and analyze the propagation mechanism with scattering and clutter.			1						

			4	Classify different steps in receiver design and its parameters for determination of position.				2						
5	15EC51A	Microwave Semiconductor Devices and Applications	1	Understand the behavior of high frequency equivalent circuits and operation of varactor, schottky diodes with applications.				1						
			2	Outline the functionality of tunnel and IMPATT diodes with performance characteristics.	1									
			3	Estimate the applications of Gunn and PIN diodes in microwave integrated circuits.				2						
			4	Categorize different microwave transistors and their applications.			1							
6	15EC51B	Global Navigation Satellite System	1	Understand GPS and UTC Time, Signal Structure and Get an idea about Receiver Components and Specifications.	1									
			2	Perform Mathematical Analysis to estimate Clock Errors, Total Electron Content and Dual Frequency.		3								
			3	Discussion on GPS Data Processing and Position Fixing.		1								
			4	Understand GNSS Principle of Operation and Architecture.	1									
			5	Understand Different Satellite Navigation Systems like Galileo, GLONASS, IRNSS Space, Control and Ground Segments.	1									
7	15EC5205	Microwave and Millimetric wave circuits	1	Classify different microwave circuits based on applications.		1								
			2	Estimate the importance of transformers and resonators in microwave circuit design.			3							
			3	Design of microwave filters and periodic structures.				3						
			4	Understand the feeding principles and excitation techniques in waveguide design.				1						
			5	Construct millimeter wave circuits using electromagnetic tools.				3						
8	15EC5206	Antenna Measurements	1	Understand the concepts of antenna pattern measurements and modeling techniques.		1								
			2	Estimate antenna testing in different environments like elevated, ground, near and radar cross section.			2							
			3	Examine the far field testing of antenna for gain, directivity and patterns.		1								
			4	Analysis of compact ranges and near field testing with cylindrical and spherical scanning.				2						
			5	Determine antenna parameters using measurement instruments like VNA and SR in real time environment.					1					
9	15EC5207	Wireless Cellular Communications	1	Understand the basic elements of cellular mobile radio system design.	1									
			2	Identify different applications of speech coding in wireless systems.			1							

			3	Understand the radio propagation and cellular engineering concepts	1									
			4	Identify digital modulation and demodulation principles and architectures, interference in wireless communication systems.	1									
10	15EC5208	Modern RADAR Systems	1	Summarize the advanced techniques in modern radar system.	3									
			2	Categorize advanced pulse compression waveform modulations and techniques.	1									
			3	Understand the concept of MIMO radar system and applications.			1							
			4	Realize the radar applications related to sparse reconstruction and compressed sensing and digital beam forming.			2							
11	15EC52C	Estimation and Detection Theory	1	Classify different criteria associated to detection theory at receiver.	1									
			2	Understand the concepts of integration of optimum receiver and matched filter receiver.			1							
			3	Analyze the maximum likelihood estimation methods.	3									
			4	Understand the concepts of estimation in the presence of Gaussian noise and prediction with Kalman filters.			1							
12	15EC52D	RF and Microwave System Design	1	Understand the importance of RF & Microwave System design with passive components.	1									
			2	Understand Smith chart concept for analyzing S, Y, Z parameters.	1									
			3	Analyze S-parameters with conversions and modeling.	2									
			4	Design of RF- filters, amplifiers and oscillators.			3							

Professor incharge

Head of the department