K L University

Department of Electronics and Communication Engineering <u>Academic Year 2016-17</u>

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

Student Outcomes

Mission statement of K L University:

<u>Vision:</u>

To be a globally renowned university.

<u>Mission</u>

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

а	Ability to apply knowledge of mathematics, science, and
a	engineering
b	Ability to design and conduct experiments, as well as to
b	analyze and interpret data
	Ability to design a system, component, or process to meet
с	desired needs within realistic constraints such as economic,
Ũ	environmental, social, political, ethical, health and safety,
	manufacturability, and sustainability
d	Ability to function on multidisciplinary teams
е	Ability to identify, formulate, and solve engineering problems
f	Understanding of professional and ethical responsibility
g	Ability to communicate effectively
	Broad education necessary to understand the impact of
h	engineering solutions in a global, economic, environmental,
	and societal context
;	Recognition of the need for, and an ability to engage in life-long
1	learning
j	Knowledge of contemporary issues
k	Ability to use the techniques, skills, and modern engineering
ĸ	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	\checkmark	\checkmark	\checkmark
PEO2	\checkmark	\checkmark	\checkmark
PEO3	✓		✓
PEO4	✓	\checkmark	\checkmark

Mapping of PEOs with SOs

	PEO1	PEO2	PEO3	PEO4
а	✓	✓		
b	✓	✓		
С	✓	\checkmark		
d	✓	✓		✓
е	✓	\checkmark		
f			✓	✓
g	✓	\checkmark		\checkmark
h		✓	✓	✓
i	✓		✓	✓
j	✓			\checkmark
k	✓	✓		
PSO1	✓	~		
PSO2	✓	✓		

S. No	Course code	Course Name		CO NO	Description of the Course Outcome				N	lapj	ping	g wit	th S	0				
						а	b	С	d	е	f	g	h	i	j	k	PSO 1	PSO 2
	MANITIE ENCES	S & SOCIAL																
			1		Remember speech sounds and apply stress and intonation rules to enhance pronunciation skills.							1						
1	15 EN 1101	Rudiments of Communication Skills	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	Interpersonal Communication	1	1	Understand the method of identifying the meaning of words from the context and form sentences using words.							1						
-	1202	Skills	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			
			1	1	Understand the concept of Group Discussion and listen and speak effectively during the discussion.				1			
3	15 EN 2103	Professional Communication Skills	2	2	Understand and improve learners' competency in competitive English and apply the principles of grammar in real life contexts.				2			
		Skiis	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			

			3	3	strategies in professional communication skills like, reports, resume and minutes of the meeting. Understand the organization of the passage and also				2			
					analyze the tone, attitude and style of the author.							
			4	4	Acquire knowledge of and apply people skills in various social organizational and corporate ambiences			2				
			1	1	Understand the method of identifying synonyms and antonyms and analyze the meaning of a word from the context.					1		
5	15 EN 3105	Verbal and Quantitative Reasoning	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		

					relations and various types of arrangements							
			1	1	Understand and analyze the depth of a topic and use the advanced levels in creative speaking and debating.				1			
			2	2	Understand and analyze various strategies involved in writing an essay and apply various styles in writing.				2			
6	15 EN 3206	Corporate Communicati on Skills	3	3	Understand and analyze the given text critically and answer questions on critical reasoning based on the given information.				3			
			4	4	Acquire knowledge on various employability skills & analyze a situation and develop adaptability.			3	3			
			5	5	Apply the Concepts of basic geometry and their importance while solving the problems				2			
7	15 GN 1001	Ecology and Environment	1	1	Understand the importance of Environmental education and conservation of natural resources.					1		
			2	2	Understand the importance of ecosystems and biodiversity.							

			3		Apply the environmental science knowledge on solid waste management, disaster management and EIA process.					2		
			1		Understand and identify the basic aspiration of human beings				1			
8	15 GN 1002	Human Values	2		Envisage the roadmap to fulfill the basic aspiration of human beings.				2			
			3	3	Analyze the profession and his role in this existence.				2			
			1	1	Formulate physical laws and relations mathematically in the form of first order differential equations and identify a method for solving and interpreting the results.			1				
9	15 MT 1001	Single Variable Calculus and Matrix Algebra	2	2	Formulate physical laws and relations mathematically in the form of second/higher order differential equations and identify a method for solving and interpreting the results.			1				
			3	3	Provide solutions for Fourier series of periodic/ non-periodic phenomenon in models involving differential equations.			1				
			4	4	Apply numeric solution methods for a system of linear algebraic equations and application oriented matrix eigenvalue			1				

					problems.						
			5	5	Verify the solution of problems through MATLAB.						
			1	1	Determine the maximum and minimum values for the function involving two variables		2				
10	15 MT	Multivariate	2	2	Calculate the length of the arc, area, volume of the surface of a solid revolution		2				
	1203	Calculus	3	3	Model the given phenomena as a partial differential equations of first and second orders						
			4		Solve the partial differential equations by analytical and finite difference methods		2				
			5	5	Verify the solution of problems through MATLAB.						
11	15 MT 2005	Probability and Stochastic Models	1	1	Construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance						
			2		Predict the relationship between two variables and construct the linear and non- linear regression lines for the given data		2				

			3	3	Model the Single and multi server markovian queuing models with finite and infinite capacity. Verify and validate the simulation models.				2				
			5	5	Verify the solution of problems through MATLAB/MINITAB.								
			1		Apply the concept of forces, governing static equations and analyze planer system of forces. Apply different analytical methods on spatial system of forces and analyzing them	2							
12	15 ME 1001	Mechanics	2	2	Understanding the concepts of planar and non-planar system of parallel forces and analyzing them. estimate moment of inertia of lamina and material bodies	2							
			3	3	Analyzing the rigid bodies under translation and rotation with and without considering forces.				1				
			4	1	Understanding the engineering mechanics physical systems prepare and demonstrate the models with the help of mechanics concepts to 0solve the engineering problems				1				
			5	5	Apply the concepts of mechanics and		2						

					carryout different experiments and analyze the results							
			1	1	Understand the concepts of crystallography and crystalline imperfections in order to determine crystal structures and to identify defects in crystals		1					
13	15 PH	Engineering	2	2	Understand electrical and optical properties of materials and apply them to know various mechanisms involved in electrical, electronic, optical optoelectronic devices.		1					
	1001	Materials	3	3	Understand mechanical and thermal properties of materials and apprehend their importance in identification of materials for specific engineering applications		1					
			4	4	Understand magnetic properties of materials and apply them to know various mechanisms involved in magnetic memory devices and transformers.		1					
			5	5	Understand various properties of materials and apply the knowledge to execute the related experiments to get hands on experience and also to develop some inter		1					

					disciplinary projects.								
			1	1	Predict potential complications from combining various chemicals or metals in an engineering setting.		1						
14	15 CY 1001	Engineering Chemistry	2	2	Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena.		1						
			3		Examine water quality and select appropriate purification technique for intended problem.		1						
			4	4	Apply phase rule, polymers, conducting polymers and nano chemistry to engineering processes.	1							
			5	5	An ability to analyze & generate experimental skills.	1							
			1	1	Acquire the Knowledge of basic biology]				
15	15 BT	Biology for	2	2	Acquire the Knowledge of Human Biological Systems				1	-			
15	1001	Engineers	3	3	Acquire Knowledge on Microorganisms and Biosensors]	-			
			4	4									

			1	1	Understand the circuit elements, kirchhoff's law and theorems to solve the networks	1							
16	15 EE 1201	Fields & Networks	2	2	Apply the procedure to determine form factor and peak factor to different symmetrical & unsymmetrical waves.	2							
			3	3	Apply vector algebra to field fundamentals to analyze electric and magnetic field distributions	2							
			4	4	Apply Maxwell's equations for static and time varying fields	2							
			5	5	Test and Analyze the concepts learned in fields and networks by conducting experiments or by any simulation softwares	2							
	GINEER									1			
			1	1	Understand the basic principles of engineering design					2			
17	15 GN 1004	Introduction to Engineering	2	2	Understand the aspects of critical thinking and problem solving in engineering					2			
		J	3	3	Apply to knowledge of critical thinking to frame real-world problems and provide basic solution approach to such problems from engineering				3				

					perspective								
			4	4	Understand and analyze the possible career options in Engineering and develop strategic plan, career targets and mechanism to achieve the same.								
			1	1	Illustrate how problems are solved using computers and programming.	2		2			1	1	
18	15 CS	C Programming	2	2	Illustrate and use Control Flow Statements in C.	2		2			1	1	
a	1101	& Data Structures-1	3		Interpret & Illustrate user defined C functions and different operations on list of data.	2		2					
			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	
			1		Solve typical problems using computers and programming.	2		2				1	
18 b	15 CS 1201	C Programming & Data Structures-2	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					

					Hashing.									
			5	5	Apply the knowledge obtained by the course to solve real world problems.	2	2		2				1	
			1	1	Draft orthographic Projections, Isometric views, projection of planes, Manually and prepare Models in workshop by using drawings.							2		
19	15 ME 1002	Engineering Graphics	2	2	Draftorhtographic projections ,isometric views, projection of planes using Autocad. Draft projection of solids Manually and by using AutoCAD and prepare Models in workshop by using different workshop trades							2		
			3	· · 2	Draft Development of surfaces of solid and sections of solid Manually							2		
			4	4	Practicing house wiring through Auto Cad							2		
			5		Develop 2D & 3D components using Auto Cad Software		2							2
20	15 GN 1003	Measurement s	1	1	Understand and apply the fundamentals of a measurement system, characteristics, and metrology using simulation and experimentation tools.	2	2							

			2	2	Understand various electrical & computer parameters, and apply different measuring techniques on various electrical parameters using simulation and experimentation tools.	2	2						
			3	3	Understand electronic & electro- physiological parameters, and apply measuring techniques on electronic parameters using simulation and experimentation tools.	2	2						
			4	4	Understand and apply different measuring techniques on civil and mechanical parameters using simulation and experimentation tools.	2	2						
			5	5	Apply the theoretical concepts to measure different parameters		2						
			1	1	Understand Basic Concepts of OOP, introduction to classes and objects through Java Language and apply.				2				
21	15 CS 2002	Object Oriented Programming	2	2	Understand the concepts of constructors, Overloading, parameter passing, access control, Inheritance and apply.				2				
			3	3	Understand Packages, Interfaces, and Exception Handling and apply.				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		
			1	1	Demonstrate signals and their Spectra 2	2						1	
22	15 EC	Signal	2	2	Analyze discrete time systems	2						1	
	2002	Analysis	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	
			1	1	Understand sets, relations, functions and discrete structures , Count discrete event occurrences	2						1	
23	15 CS	Discrete	2	2	Apply Propositional logic and First order logic to solve problems	2						1	
	2003	Mathematics	3	З	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	

			5	5	Relate practical examples to the appropriate set, function or relation model and interpret the associated operations and terminology in context						2		2
			1	1	Understand numerical and character representation in digital logic, number system, data codes and the corresponding design of arithmetic circuitry.			2				3	
			2	2	Understanding Logic gates, Logic theorems, Boolean algebra and SOP/POS expressions.			2				2	
24	15EC 1101	Digital System Design	3		Combinational and sequential systems design using standard gates and filp-flops and minimization methods			2			2	2	
			4	4	Verilog HDL design for logic gates, combinational and sequential Logic Functions.			2			2	3	
			5	5	Concepts of Programmable Logic devices.			2			2		
			1	1								1	
25	15 EM	Computer Organization and	2	2								1	
	2001	Architecture	3	3								1	
			4	4								1	
26	15 EC	Analog Electronic	1	1	Understand the industrial processes and organizations connected with the profession		3						2

	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	
			1	1	Able to understand and analyze the architectural features of CISC type of General purpose processor Intel 8086 Microprocessor.			2			3	1	
27	15 EM 2202	Processors and Controllers	2	2	Able to understand and analyze the architectural features of CISC type of microcontroller - Intel 8051Microcontroller.			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	
			1	1	Study and design of combinational and sequential circuits using PLDs and state machines.		2					1	
28	15 EC 2204	Design with CPLD & FPGA	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		
	00		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
			1	1	Understand various signals and model physical process using them.		2				2	3
30	15 EC 2206	Signal Processing	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
			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	
31	15 EE 2207	Control Systems	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.								
			1	1	Understand OSI and TCP/IP models						2	1	
32	15 CS	Computer	2	2	Analyze MAC layer protocols and LAN technologies			2					
	2208	Networks	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		
			1	1	Able to analyze embedded systems, analyze and program on chip peripherals for a single purpose controller		2				3		
33	15 EM 3103	Embedded Systems	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	Able to develop a prototype for a real time embedded application using project based labs.		2				3		
			1	1	To understand the VLSI fabrication process and to be able to interact with integrated circuit process engineers	2							
	45 50		2	2	To analysis the theory and CV characteristics of MOS transistor	2						1	
34	15 EC 3107	CMOS VLSI Design	3	3	To analysis MOS gate static and switching characteristics	2						1	
			4	4	To design and layout MOS logic circuits						3	1	
			5	5	Circuit Characterization and Performance Estimation and scaling						3		2
			6	6	Logic and Fault Testing	2					3	1	
			1	1	Understand the principles behind microwave transmissions, impedance matching and waveguides	2							
35	15 EC 3108	Communicatio n Theory-2	2	2	Identify different antennas and their parameters	2						1	
			3	3	Analyze the antenna measurement techniques	2					S	1	
			4	4	Analyze the microwave components	2						1	

			5	5	Examine the microwave measurements using VNA and SA	2				2	1	
			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	
36	15 EC 3209	Communicatio n Theory-3	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	
			1	1	Acquire the fundamental concepts of a digital image processing system	3					1	
37	15 EC 4110	Digital Image Processing	2	2	Identify and exploit analogies between the mathematical tools used for 1Dand 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 developsan 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	
Pr	ofession	al Electives			Communication stream									2
			1	1	Differentiate different RF components and transmission lines				2	2				
38	15 EC 3252	RF System Design	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		
			1	1	Demonstrate the radiation mechanism and antenna parameters					2			2	
39	15 EC	Radiation	2	2	Distinguish different types of radiation from apertures					2				
	4162	Systems	3	3	Select the antennas and arrays based on the specific application					2				
			4	4	Evaluate the antenna performance with measurement techniques					2				

			1	1	Compare different types of radars and their limitations				2	2			
40	15 EC	Radar and Navigational	2	2	Illustrate the operation of MTI Radar and types of tracking methods				2			1	
	4163	AIDS	3	3	Differentiate different radar transmitters and receivers				2	2		1	
			4	4	Compare different types of electronic counter measures				2	2		1	
			1	1	Differentiate different Microwave components					2		1	
41	15 EC 4164	Microwave and millimeter Wave	2	2	Identify transformers and microwave resonators					2	2	1	
		Circuits	3	3	Design different microwave filters					2	2	1	
			4	4	Distinguish microwave and millimetric wave circuits					2	2		2
			1	1	Describe the EMI specifications and standards				2			1	
42	15 EC 4165	EMI/EMC	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								
			1	1	Demonstrate different wireless communication systems and radio propagation mechanism				2				
43	15 EC 4166	Cellular Communicati ons	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	
			1	1	Demonstrate the basic concepts of satellite communication and orbital mechanics				2			2	
44	15 EC 4167	Satellite Communicati	2	2	Illustrate the satellite subsystems and link design				2			1	
		ons	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	Optical Communicati	1	1	Dramatize the importance of optical communication				2			1	
	4168	on	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		
			1	1	Describe the basic terminology of information theory and coding			2				
46	15 EC	Information Theory &	2	2	Demonstrate the encoding of the source output			2				
	4169	Coding	3	3	Illustrate the importance of error control in coding			2				
			4	4	Distinguish different binary cyclic codes and convolution codes			2				
			1	1	Demonstrate the concept of Software defined radio			2				
47	15 EC 4170	Software Defined	2	2	Describe the architecture of SDR			2				
		Radio	3	3	Illustrate the programming concept of SDR			2				
			4	4	Differentiate the segment design tradeoffs						1	
40	15 EC	Fundamental s of	1	1	CO1 Distinguish different methods of warfare and target identification			2				
48	4171	Electronics Warfare	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				
			1	1	Differentiate different electronic navigational aids								
	15 EC	Electronic	2		Demonstrate the satellite navigation mechanism				2				
49	4172	Navigation Systems	3	3	Illustrate the working principle of GPS antenna system				2				
			4	4	Discriminate ship master compass and automatic steering techniques						2		
			1	1	Demonstrate different types of radars					2			
	15 EC		2	• • •	Illustrate the working principle of MTI radar and its tracking mechanism					2			
50	4173	Radar	3	3	Discriminate radar transmitters and receivers					2			
			4	4	Demonstrate basic principles synthetic aperture radar					2			
51	15 EC 4174	Computation al 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							
			1	1	To establish the theory necessary to understand and use of Intelligence in system control and related constructions.				2			
52	15 EC 3253	Intelligent Systems and Control	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		
	15 50	Adaptive	1	1	To establish the theory necessary to understand and use of Adaptiveness in system control and related constructions.					2		
53	15 EC 4175	signal Processing	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	
			1	1	To establish the theory necessary to understand and use Statistics and related constructions.					2		
	15 EC	Statistical	2	2	To emphasize construction of efficient algorithms for real time applications.					2		
54	4176	Signal Processing	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		
			1	1	To establish the theory necessary to understand and use speech based systems and related constructions.				2			
55	15 EC 4177	Speech Signal Processing	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		
			1	1	To establish the theory necessary to understand and use of multimedia in system control and related constructions.				2			
56	15 EC 4178	Multimedia Signal	2	2	To establish the theory necessary to understand and use of Motion Estimation				2			
		Processing	3	3	To emphasize on efficient algorithms for multimedia based systems.					2		
			4	4	To emphasize on Multimedia Content Representation and Retrieval					2		
			1	1	To establish the theory necessary to understand and use of Intelligence in system control and related constructions.				2			
57	15 EC 4179	Neural Networks and Fuzzy Control	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							
			1	1	Understand the functionality and Electrical Properties of MOS and BJT Devices			2				
	15 EC	Analog VLSI	2	2	Analyzing and design of passive & active current mirrors			2	2			
58	3251	Design	3	3	Analyze different active MOS loads and frequency responses			2	2			
			4		Study of the different amplifiers and feedback topologies				2			
			1	1	Understand the basic concepts of MEMS technology and Micro system design				2			
59	15 EC	Applications of MEMS	2	2	Analyze the fabrication process methods and micro system level packaging				2		1	
	4154	Technology	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	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	
			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		
61	15 EC 4156	Design for Testability	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		
			1	1	Understand the basic semiconductor memories and memory technologies				2		
62	15 EC 4157	Design of Semiconduct	2	2	Analyze the fault modeling, testing of Ics, memory reliability and radiation effects				2	1	
	-	or Memories	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	1	Study of the custom, cell based design methodologies				2	2		
66	15 EC 4161	VLSI Technology	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