K L University

<u>Department of Electronics and Communication Engineering</u> <u>Academic Year 2013-2014</u>

Mapping of ECE Department Mission Statement with SOs, 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:** 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

	Ability to apply knowledge of mathematics, science, and
а	engineering
h	Ability to design and conduct experiments, as well as to analyze
b	and interpret data
С	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
е	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.

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

Mapping of PEOs with Pos

	PEO1	PEO2	PEO3	PEO4
а	✓	✓		
b	✓	✓		
С	✓	✓		
d	✓	✓		✓
е	✓	✓		
f			✓	✓
g	✓	✓		✓
h		✓	✓	✓
i	✓		✓	✓
j	✓			✓
k	✓	✓		

Mapping of COs with SOs

			CO Vs SO Attainment 2013												
De	partment	Electronics and Communication Engineering	SO	а	b	С	d	е	f	g h	i	i j	k	Added/ Retained/Modified	Course Rationale
SI	Course		CO#												
No	Code	Course Title									_		-		
			Draft orthographic Projections, Isometric views, projection of planes, Manually and prepare Models in workshop by using drawings.	1									1	Modified	Students acquire the skills to draft
			Draft orthographic projections, isometric views, projection of planes												and modeling of
		Engineering Graphics	using AutoCAD. Draft projection of solids Manually and by using AutoCAD	1									1		physical designs
1	11ES104	With CAD	and prepare Models in workshop by using different workshop trades												using CAD.
			Draft Development of surfaces of solid and sections of solid Manually	1									1		
			Practicing house wiring through Auto Cad	1									2		
			Develop 2D & 3D components using Auto Cad Software	1									2		
			Formulate physical laws and relations mathematically in the form of first order differential equations	1										Added	Students develop the skill
			Higher order differential equations and identify a method for solving and interpreting the results.	1										-	to apply various
2	13BS102	Differential Equations	Provide solutions for Fourier series of periodic/non-periodic phenomenon in models involving differential equations.	1										-	mathematics for practical
			Model the given phenomena as a partial differential equations of first and second orders	1											electronics and communication
			Solve the partial differential equations by analytical and finite difference methods												applications.
			Understanding the basic scalar types, input/output functions operators, and expressions					2						Modified	Students understand the
		Problem Solving	Understanding statements and control flow charts	1				1							basic concepts
3	13ES101	Through Programming	Understanding the functions, arrays, pointers.	1				1							and develop skill to implement by
			Understanding and applying structures, characters, strings, and storage classes.	1				2							programming
4	13ES102	Measurements	Understand and apply the fundamentals of a measurement system, characteristics, and metrology using simulation and experimentation tools.					1						Modified	Course develops the understanding in

			Understand various electrical & computer parameters, and apply different measuring techniques on various electrical parameters using simulation and experimentation tools. Understand electronic & electro-physiological parameters, and apply measuring techniques on electronic parameters using simulation and experimentation tools. Understand and apply different measuring techniques on civil and mechanical parameters using simulation and experimentation tools.	1 1 1	1 2				measuring various physical quantities and develop skill through practical experiments.
			Understand the concepts of crystallography and crystalline imperfections in order to determine crystal structures and to identify defects in crystals Understand electrical and optical properties of materials and apply them to know various mechanisms involved in electrical, electronic, optical, optoelectronic devices.	1				Modified	Students understand the concepts of material physics and develop skill
5	13ES103	Engineering Materials	Understand mechanical and thermal properties of materials and apprehend their importance in identification of materials for specific engineering applications Understand magnetic properties of materials and apply them to know various mechanisms involved in magnetic memory devices and	1					to propose various inter discipline projects
			transformers. 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 disciplinary projects.	1					
			Understand and analyze the depth of a topic and use the advanced levels in creative speaking and debating. Understand and analyze various strategies involved in writing an essay and apply various styles in writing.				1	Added	Students understand the importance of language
6	13HS102	Language and Reasoning Skills	Understand and analyze the given text critically and answer questions on critical reasoning based on the given information. Acquire knowledge on various employability skills & analyze a situation and develop adaptability.				1		proficiency and reasoning skills in professional environment
			Apply the Concepts of basic geometry and their importance while solving the problems.			1	2		
7	1246104	Human Values	Understand and identify the basic aspiration of human beings Envisage the roadmap to fulfill the basic aspiration of human beings.			1		Added	Course enhances the ethics suitable
	13HS104	numan values	Analyze the profession and his role in this existence.			1			for professional jobs and entrepreneurship

8	13BS103	Engineering Physics	Understand the concepts of crystallography and crystalline imperfections in order to determine crystal structures and to identify defects in crystals Understand electrical and optical properties of materials and apply them to know various mechanisms involved in electrical, electronic, optical, optoelectronic devices. Understand mechanical and thermal properties of materials and apprehend their importance in identification of materials for specific engineering applications Understand magnetic properties of materials and apply them to know various mechanisms involved in magnetic memory devices and transformers. 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 disciplinary projects.	1 1 1 1	1				Modified	The course enhances the skill to understand and apply various physical properties of materials.
9	11BS105	Ecology and Environment	Understand the importance of Environmental education and conservation of natural resources. Understand the importance of ecosystems and biodiversity. Apply the environmental science knowledge on solid waste management, disaster management and EIA process.				1 1 1	1 1 1	Modified	Course enhances the environmental education suitable for professional jobs and entrepreneurship
10	13ES106	Mechanics	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 Understanding the concepts of planar and non-planar system of parallel forces and analyzing them. estimate moment of inertia of lamina and material bodies Analyzing the rigid bodies under translation and rotation with and without considering forces. Understanding the engineering mechanics physical systems prepare and demonstrate the models with the help of mechanics concepts to solve the engineering problems Apply the concepts of mechanics and carryout different experiments and analyze the results	2 1 1 2	3	1 1 1 2			Added	Students acquire the skill to apply various mechanical concepts to practical problems
11	13ES105	Workshop Practice	Hands on experience on common tools in carpentry, fitting, tin smithy and soldering. Demonstration on work working, electrical and mechanical engineering practice. Understanding the peripherals of CPU, assemble and dissemble of PC.					2 2 2		Enhances skill on various peripherals

			Predict potential complications from combining various chemicals or metals in an engineering setting. Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena.	1						Modified	The course enhances the skill to understand and
12	11BS104	Engineering Chemistry	Examine water quality and select appropriate purification technique for intended problem.	1							apply various chemical
			Apply phase rule, polymers, conducting polymers and nano chemistry to engineering processes.	1							properties of materials.
			An ability to analyze & generate experimental skills.		2						
			Understanding the linear algebra	1						Added	Students
			Understanding the differential calculus	1							develop the skill to apply various
13	13BS101	Linear Algebra and	Determine the maximum and minimum values for the function involving two variables	1							basic mathematics for
		Multivariate Calculus	Model the given phenomena as a partial differential equations of first and second orders	1							practical electronics and
			Solve the partial differential equations by analytical and finite difference methods	1							communication applications.
			Understand the method of identifying the meaning of words from the context and form sentences using words.					1			Students
14		English	Understand and analyze seven types of reading techniques and improve reading speed.					1		Modified	importance of
14	13HS101	Eligiisii	Understand and apply writing strategies for office/ formal communication.					1		Modified	language proficiency in professional
			Understand and analyze different cultures and the importance of empathy in cross-cultural communication.					1			environment
			Understand the representation, manipulation and processing operations of DT signals and systems	1	1	1				Added	Students acquires the skill
15	1255205	Cianal Dua acceina	Interpret the analysis of DT systems using Z.T.		2	2			2		regarding the
15	13ES205	Signal Processing	Apply the Fourier Transformation techniques for DT sequences and their applications.		2		2				basics of signal processing
			Ability to design, Implementation and realization of digital filters.						2		
			Design Basic Electronics Systems and circuits	1			1			Modified	Students acquire
		Design of electronics	Design Basic amplifiers	2	2		2				the basic understanding of
16	13EC201	systems	Design linear amplifiers using op-amps.	2	2		2				digital circuits
		<i>-</i>	Design basic applications of diode, BJT and JFET.	2	2		2				suitable for core jobs.

			Understanding the algorithm analysis and stacks and queues	1	1			Added	Students
			understanding trees and hashing	1	1				understand the
17	13ES204	Data Structures	Understanding priority queues and sorting.	1	1				concepts and
			Understanding the graph algorithms	_					apply the skill to practical
			Onderstanding the graph algorithms	1	1				applications
			Understand the VI characteristics of electrical elements, solution of					Modified	Students
			complex problems of DC circuits using transformations, nodal, mesh	1					understand the
			analysis and theorems.				1		electrical
10	1255202	Notweel Theory	Understand the fundamentals and interconnection relations of 3 –	1					characteristics of
18	13ES203	Network Theory	phase circuits.	1			1		various circuits
			Analyze the series and parallel resonance and magnetic circuits.	2			2		and develop the
			Analyze the transient analysis of DC / AC circuits, two port networks and	3					skill for practical
			solve complex networks using topology.	3			2		applications
			Understanding numerical methods	1		1		Added	Course develop
		MATHEMATICAL	Understanding Fourier series and transforms	1		1			the skill in various
19	13BS201	METHODS	Understanding Z transforms	1		1			numerical
			Understanding probability and distributions	1		1			methods and
				1		1			transformations
			The student will be able to understand basic Concepts of OOP,					Added	Students
			fundamentals of java and apply the concepts of classes and objects	2	2				understand the
		OBJECT ORIENTED	through Java Language.						concepts of OOP
20	13ES202	PROGRAMMING	The student will be able to apply constructors, Overloading, parameter	2	2				and develop to
			passing, and access control in Java programming.			+++			apply for practical
			The student will be able to apply Inheritance, Packages, Interfaces.	2	2				implementation
			Understand the representation of data using different codes and the			++		Modified	Students acquire
			principles of Boolean algebra to manipulate and minimize logic	1	1				the basic
			expressions						understanding of
			Analyze the functioning of different combinational logic circuits built						digital circuits
		Basics of Digital	with logic gates and the design procedure for developing circuits like		2				suitable for core
21	13EC203	Systems	adders, decoders, code converters, etc.						jobs.
		o you can be	Analyze the behavior of flip-flops and the operation of sequential		2				
			circuits using flip-flops		-				
			Apply the design approach for creating sequential circuits like counters,						
			shift registers, etc., and the concept of ASM charts in describing the		2				
			digital systems						

			Understand the basic principles of linear modulation and demodulation techniques		1	1			Modified	Student can able to understand
		Amalan	Explore analog and pulse modulation and demodulation techniques.		2	2				the various
22	13EC207	Analog Communications	Elucidate the basic principles of angle modulation and demodulation techniques		2	2				modes of higher communication
			Analyze the basic analog transmitters and receivers in the presence of noise		2	2				systems.
			Design different types of feed-back amplifiers and provide general solution for real time problems		3	3			Added	Students acquire the basic
	40-00-	Analog Electronic	Design different types of Oscillators and provide general solution for real time problems, and Design active filters using OPAMPs		3	3				understanding of digital circuits
23	13EC205	Circuits	Design other non-linear applications of OPAMPs such as precision rectifier, zero crossing detector, etc, Design the applications of 555timer		3	3				suitable for core jobs.
			Analyze different types of Power amplifiers		2	2				
			Apply the principles of vector calculus to estimate the static Electric field due to different sources.		1	1			Modified	Student can able to analyze EM
			Obtain the boundary conditions on E field and understand the conecpts of magnetic field to calculate the static H field due to different sources.		2	2				propagation through various
24	13EC202	Electromagnetic Fields Theory	Develop the boundary conditions on H field and extend the concepts of static fields to obtain the governing laws of electromagnetic field.		2	2			_	medium, which is require for the
			Perceive the propagation of uniform plane wave and its characteristics in different media, and interpret the characteristics of the guided waves to understand the modes of propagation in rectangular Wave-guide.		2	2				understanding of specialized courses.
			Understanding complex variables	1				1	Added	Course develop
	4205222	Complex Variables &	Understanding special functions	1				1	1	the skill in various functions
25	13BS202	Discrete Mathematics	Understanding differential equations	1				1		and graph theory
			Understanding graph theory	1				1		
			Understand the fundamentals of thermodynamic systems and processes	2	1	2			Added	Course develop
26	13ES201	Thermodynamics	Apply laws of the thermodynamics and principle of entropy to engineering devices.	2	2	2				the skill to apply law of
		,	Analyze various air standard cycles and their performance.	2	2	2				thermodynamics in practical
			Evaluate the performance of fuels and combustion to various engines.	2	2	2]	circuits.
27	13EC313		Understand basic radiating process and their parameters.	1]]	1			Modified	
		1					1 1			

		Antenna & Wave Propagation	Understand and analyze the characteristics of different wire aperture and array antennas and the comparison between different state-of theart antenna technologies and processes. Describe the wave propagation mechanisms at various levels of free space, deciding a suitable antenna for such a scenario. Analyze antenna design and performance measures.		2 2 2	2	2			2		Student can able to understand the various modes of wireless communication systems.
28	13EC308	Digital Communication	Understand the fundamentals of digital communications and analyze the pulse digital communications, Matched filter performance, Inter Symbol Interference. Demonstrate about Nyquist channel, Signaling Schemes and Signal Space Analysis.	1 2	2		2				Modified	Student can able to understand the various modes of higher communication
			Analyze pass band data transmission and Comparison of different M-ary schemes. Analyze different digital modulation schemes using single carrier.	2	2		2					systems.
			Discuss different networks namely LAN, WAN, Internet and OSI, TCP/IP Models and basics of physical layer and data link layer issues Demonstrate Data Link layer design issues, medium access control sub layers and network layer design issues concepts				1 2			1 2	Modified	Student to understand the concepts and develop skill to
29	13CS205	Computer Networks	Analyze and implement the algorithms of Network Layer and related services Examine the concepts of Transport Layer and the Application Layer functionality				2			2		apply for practical implementations
			Understand semiconductor device fabrication process	1							Modified	Students acquire
			Analyze the characteristics of CMOS circuits Construction and the comparison between different state-of-the-art CMOS technologies and processes				2	2		2		the basic understanding of digital circuits
30	13EC206	CMOS VLSI Design	Implement the a complete design verification process using computer- automated tools for scaling, layout, extraction, simulation, and timing analysis				2	2		2		suitable for core jobs.
			Understand and analyze the design testing principle, time-delay concepts				2	2		2		
			Understand the logical gates to construct combinational & sequential circuits to perform arithmetic μ-operations.	2	2		2	2		2	Modified	Course develop the skill to
31	13EM201	Computer Organization	Develop micro Programs for design of Control Unit, CPU	2	2		2	2		2		analyze and
		O I Guille Lation	Analyze and realize operations like Multiplication, Floating Point algorithms using supporting modern engineering tools.	2	2		2	2		2		realize the operation of

			Understand the Peripherals, I/O interface and Direct Memory Access.	2	2	2				2		modern engineering tools
			Understand the campus selection process with special focus on Effective Communication and Attitude. Analyze himself/herself for the campus Interviews.				2			1	Added	Course enhances the skill with focus on
32	13AC202	Employability Skills	Understand the professional behaviors' for entry into the professional world.						1			professional life and campus interviews
			Analyze logically and solve problems in professional life.					2				interviews
			Understand the basics of Full custom, Semicustom and PLD design methodologies		1						Modified	Students acquire the basic
33	13EC312	Design with PLD and FPGA	Design various combinational & sequential logic realizations using PLEs & PLDs.		2							understanding of digital circuits
			Analyze the architectures of different FPGAs.		2							suitable for core
			Design various sequential logic realizations using new generation PLDs.		2							jobs.
			Understand the essential features and principles of microwave devices and various mathematical models which are relevant to microwave systems and asses the limitations of devices			1					Modified	Students acquires the skill to work
			Understand various types of High gain and wide band Microwave tubes			1						microwave
34	13EC314	Microwave Engineering	Understand the microwave passive devices, Tee junctions and various ferrite devices.			1						systems and microwave
			Understand the operation of solid state devices (Various Diodes operate at high frequency), ferrite devices and analyze the measurement of parameters at high frequency level.			2				2		communication systems.
			Understand the working of Microcontroller 8051 and apply the knowledge of Architecture and Instruction Set		2						Modified	Students acquires the skill
35	11EC311	Microprocessors & Microcontrollers	Understand the working of Internal Peripherals of 8051 and Apply Interfacing concepts of few I/O Peripherals to 8051 through programming.	:	2							to work with microprocessors and
			Understand the functional model of Microprocessor 8086 (term)		2							microcontrollers
			Understand the working model of ARM Processor		2							
36	1250240	Information Theory	Understand the technique of measuring information and average of information for the independent and dependent sources.			1				1	Added	Students acquires the skill
36	13EC340	Coding	Apply the procedure for Huffman, Shannon-fano Encoding methods and getting rate of information transmission.			2				2		regarding the security of

			Apply the procedure to calculate channel capacity and to detect/correct errors using linear block codes.				2		2		information for wireless
			Apply the concept of the encoding for binary cyclic and the convolution codes.				2		2		communications.
			Understand the basic concept of reliability and modeling of faults as a requisite for achieving manufacturing quality of semiconductor devices and then testing techniques, fault detection in combinational circuits are described.		1					Added	Students acquires the skill regarding the testing of VLSI
37	13EC364	Design for Testability	Describe the testing & fault detection in sequential circuits, and then minimization and folding techniques to achieve area-efficient design of VLSI chips.				1				circuits and systems.
			Illustrate the fault detection & recovery methods to achieve fault tolerant design of VLSI chips.				2				
			Examine The test pattern generation for BIST and specific BIST architectures.		2						
			Acquire the fundamental concepts of decimation and interpolation for multirate signal processing	1					1	Added	Students acquires the skill
20	4050074	Modern Digital Signal	Estimation of power spectrum using parametric and non-parametric method. Matlab implementation to demonstrate relative merits and demerits				2		2		regarding applications of signal processing
38	13EC371	Processing	Realization of DFT filter banks and trans multiplexers analysis. Demonstration and implementation for two channel perfect reconstruction in time and frequency domain.				2				processors.
			Demonstration of DFT filter banks in Sampling rate converter, Phase shifter, Sub band coding and Sensor systems				2				
			Analyze the components of TCP suite				2		2	Retained	Students acquire
39	13CS 334	TCP / IP	Analyze the concepts of IP protocol ,mobile IP,P Addressing mechanisms & attacks on IP				2		2		the skill to apply concepts to
33	1303 334	Ter / II	Apply socket API to write programs related to client server communication				2		2		various practical applications
			Applying various application layer paradigms.				2		2		
			Understand the EMI, EMC Concept , EMI Control technique such as shielding	1	1		1		1	Added	Students acquires the skill
40	13EC345	EMI/EMC	Analyze EMI Control technique such as bonding, transient suppressors, Design Guidelines	2	2		2		2		to work microwave
			Understand EMC Design guidelines	2		2	2		2		systems and
			Understand Passive Components for EMC, testing setups	1	1		1		1		microwave

											communication
			understand the physics of power dissipation, dynamic and leakage					 + +		Added	systems. Students
			power and what makes a circuit or device a low power device	1	1		1		1	Added	acquires the skill
	13EC362	Low Power VLSI	Learn power estimation CMOS circuits for by using Simulation techniques and probabilistic analysis	1	1		1		1		regarding the testing of VLSI
41		Design	Understand and apply low power techniques at circuit level and gate level	2		2	2		2		circuits and systems.
			apply architectural techniques e.g. flow graph transformations, usage of low power data path components, low power clock structures to create low power devices	2	2		2		2		
	13EC373		Demonstrate various multirate operations and associated filter bank models.	2					2	Added	Students acquires the skill regarding applications of signal processing.
42		Multi Rate Signal Processing	Analyze maximally decimated filter bank structures and their poly phase representation.				2		2		
			Understand para-unitary systems and linear phase perfect reconstruction filter banks				1				
			Analyze cosine modulated filter banks and their poly phase structures				2				
	13CS 335	Network Programming	Analyze Socket API from Network Programming perspective				1		1	Added	Students acquire the skill to apply the concepts to practical applications
			Apply socket API for TCP and UDP to write programs related to Client/Server communication				1		1		
43			Analyze various Advanced Sockets & Networking Applications through Unix domain protocols and Routing Sockets				2		2		
			Construct multiple threads that communicate with each other using Sun RPC				2		2		
44	13EM33 2		Understand the active and passive components, characteristics and the materials used along with their properties, mounting components on PCB , classification of PCB boards				1			Added	Students acquire the skill to apply the concepts to practical
		PCB Design	Understand different copper clad laminates and their properties, Soldering techniques.				1				applications
			Apply the knowledge of schematic and layout design a PCB				1				
			Understand the basics of PCB Fabrication and generate foot print for library, etc				1				
45	11EE304	Control Systems	Students can be able to understand control system concepts such as open, closed loop systems, transfer function approach, mathematical				1			Retained	Students acquire the skill to apply

			modeling of physical systems and can understand analyze the similarities between Synchronous and ac generators						the concepts to practical
			Students can be able to Analyze the time domain and frequency response of physical systems			2			applications
			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	2		
			Students can be able to design and analyze controllers and lead, lag, lead-lag compensators			2	2		
			Acquire the fundamental concepts of Digital Signal Processing	1				Modified	Students acquires the skill regarding applications of signal processing processors. Student can able to understand the various modes of higher communication systems.
	13EC415		Learn the architecture details of Digital signal processors Architecture			2			
46		DSP Processors and Architecture	Learn the TMS320C54XX architecture details of Digital signal processors Architecture			2			
			Analyze and learn to implement the signal processing algorithms in DSPs.			2			
	13EC342	Optical Communications	Understand the basics of Light signals and different items of Optical communication link , advantages and applications .			1		Added	
47			Understand the concepts of transmission characteristics of optical fibers and Dispersion			1			
47			Understand the concepts of sources, Detectors, Electro optic modulation and optical Amplifiers for optical communications			2			
			Understand the optical communications methodologies in communication networks			1			
			Understand the functionality and Electrical Properties of MOS Devices	1	-			Added	Students
			Analyze different passive & active current mirrors			2			acquires the skill regarding the
40	4256464	Auralan VII CI Danim	Analyze different amplifiers and their frequency Responses			2			analysis and
48	13EC461	Analog VLSI Design	Understand the concept of differential amplifiers and operational amplifiers & feedback topologies			2			design of VLSI circuits that required for core jobs.
49	13EC364	RF System Design	Understand the Importance of RF and Microwave Circuit Design, Analyze RF behavior of passive components, their properties and its various applications, Compare Types of Transmission Lines and represent Equivalent Circuits			1		Added	Students acquires the skill to analyze microwave

			Analyze Smith Chart as Graphical AID/Tool for RF Design; Derive and Describe types of Smith Chart; Propose a Smith Chart for design of Active RF systems			2		communication systems.
			Analyze Scattering parameters for Single And Multiport Networks; Model Signal Flow Chart			2		
			Analyze Unit Element and Kuroda's Identities Transformations; Stability Considerations and stabilization methods, RF Amplifiers Using Small Signal Analysis			2		
			Understand and remember the fundamentals of the microcontrollers like architecture, memory organization.			1	Retained	Students acquire the skill to apply the concepts to practical applications Students acquires the skill regarding applications of signal processing for imaging applications. Students acquires the skill regarding the analysis and design of satellite systems
	11EM33	Micro Controllers	Apply the instructions in writing basic assembly language programming.			2		
50	4	Interfacing & System Design	Apply the concepts of interrupts, timers in applications where required.			2		
		Design	Analyze the differences in architectures of 8051 and PIC $\mu c's$ and Analyze Different I/O devices and their interfacing to 8051 μc			2		
			Understand the fundamental concepts of a digital image processing system	1			Added	
	13EC372	Digital Image Processing	Apply different image transformation techniques for digital image processing			2		
51			Develop algorithms for digital image processing operations such as histogram equalization, enhancement, restoration, apply these techniques to real world problems.			2		
			Develop algorithms for digital image processing operations such as, image compression and color image processing and image segmentation and be able to apply these techniques to real world problems			2		
			Understand the fundamentals of satellite communications and characteristics of communication satellites.1			1	Added	
52		Satellite Communications	Design general satellite orbital terms and elements.	2				
		Communications	Understand satellite subsystems which comprise space, earth segments and link budget parameters			1		that required for core jobs.
			Understand the basic concepts of multiple access techniques, satellite navigation and GPS			1		co.c. jobs.
53	13EC363	ASIC Design	Analyze different types of ASIC design methodologies and Different CPLD Architectures		2		Added	Students acquires the skill
53	13EC363	3 ASIC Design	Develop Program of different logic circuits using HDL and Verilog Programming and analyze different types of Faults in logic circuits.			2		regarding the analysis and

			Analyze ASIC design flow		2	2		design of VLSI
			Analyze Physical design flow of ASIC, Extraction the final circuit		2	2		circuits that required for core jobs.
54			Understanding the fundamentals of speech production and its modeling		1		Added	Students
	13EC474 13CS433		Analyzing various speech coding methods		2	2		acquires the skill regarding applications of signal processing for speech applications. Students acquire the skill to apply the concepts to practical applications
		Speech Processing	Understanding of speech synthesis models and their applications		1	L		
		opecan recessing	Demonstrate automatic speech recognition systems and analysis for their development		1	L		
			Understand the basics of light signals and different types of optical communication link methodologies		1	L	Added	
55		High Speed Optical Communication Networks	Understand the concepts of transmission characteristics of optical fibers and dispersion		1	ı		
			Analyze the concepts of optical transmission and detectors, electro optic modulation and optical amplifier		2			
			Analyze the concept of basic networks		2	2		
56	13EC447	Radar and Navigational Aids Cellular	Understand the essential principles of operation and design of simple radar systems and the associated signal processing, at block diagram level.			1	Added	Students acquires the skill regarding the analysis and design of radar systems that required for core jobs. Students acquires the skill regarding the analysis and
			Apply appropriate mathematical and computer models relevant to radar systems to calculate system performance, and assess the limitations of particular cases.	2				
			Apply the principles of Electronic Warfare, stealth and counter stealth, and bi-static radar, and apply the appropriate design equations to calculate performance.		2	2		
			Apply the principles of tracking radars and radio navigation systems (including secondary radar and GPS).		1	L		
			Understand the basic principles of wireless communication systems		1	L	Added	
	13EC444		Explore propagation mechanisms and channel interferences.		2	2		
57			Elucidate the basic principles equalizers, receiver techniques.		2	2		
		Communications	Analyze wireless systems & OFDM standards.		2	2		design of cellular systems that required for core jobs.
58	13EC465		Analyze the data converter fundamental principle by ADC and DAC	2			Added	

		Mixed Signal Circuits & Systems	Performance evaluation of different ADC and DAC circuits. Analyze Data converter Architectures and SNR by using different types of ADC and DAC Analyze the Wireless Communication Systems by using mixed-signal.			2 2 2			Students acquires the skill regarding the analysis and design of VLSI systems that required for core jobs.
			Understand concepts of signals in various domains and sensor arrays			1		Added	Students
	13EC470	Array Signal Processing	Analyze signal arrays by using different methods in far field region			2			acquires the skill regarding applications of signal processing
59			Analyze Beam foaming techniques by using various signals In spatial spectrum			2			
			Understand different algorithms used in Array signal processing			2			applications.
		Radiating Systems	Understand the basic antenna parameters of different antennas to estimate the radiation characteristics of different current distributions		2			Added	Students acquires the skill
60	13EC349		Analyzing the different distributions of an antenna and Apply the concept of radiation to reflector antenna.		2				to work microwave
60			Analyze the characteristics of linear antennas, antenna synthesis techniques and micro strip antennas.		2				systems and microwave
			Understand the different types of strip antennas and analyzing the radiation parameters using antenna measurements.		2				communication systems.
		Wireless Communications and Networking	Describe various CDMA, cellular mechanism wireless network models.	2				Added	Students acquire
61	13CS434		Discuss OFDM and multiple radio access	2					the skill to apply the concepts to
61	1503434		Explain wireless system WANS, LANS, services	2					practical
			Explain ADHOC Sensor network			2			applications