Annexure-1

COURSE VS SOS & PSO'S MAPPING

Course Code	Course Title	SNO	CO NO	Description of the Course Outcome	a	b	c	d	e	f	g	h	i	j	k	Course Type	Course Objective
15EM3103	EMBEDDED SYSTEMS	1	CO 1	Able to analyze embedded systems, analyze and program on chip peripherals for a single purpose controller			2								3	Modified	The objective of this course is to understand the basic concepts and develop a prototype for a real time embedded application
		2	CO '2	Able to interface and program different off chip peripherals and communication protocols used in embedded systems			2								3		
		3	CO 3	Able to understand, evaluate and select appropriate software architectures			2								3		
		4	CO 4	Able to analyze and design			2								3		

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embedded

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				systems using the features in real time operating systems.																
		5	CO 5	Able to develop a prototype for a real time embedded application using project based labs.			**2**								**3**					
15 EM 200 1	COMPUTER ORGANIZATION AND ARCHITECTURE	6	CO 1	Understand the functionality and design the CPU functional units - control unit, registers, the arithmetic and logic unit, the instruction execution unit, and the interconnections among these components.			**2**								**3**			**Modified**	The objective of this course is to Understand the functionality and design the CPU and its functional units	
		7	CO 2	Understand, analyze and design main, cache and			**2**								**3**					

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				virtual memory organizations.														
		8	CO 3	Understand, analyze and design different types of I/O transfer techniques.			2								3			
		9	CO 4	Understand the design issues of RISC and CISC CPUs and the design issues of pipeline architectures.			2								3			
		10	CO 5	Able to Design combinational and sequential circuits using LOGISIM			2								3			
15EM2202	PROCESSORS AND CONTROLLERS	11	CO 1	Able to understand and analyze the architectural features of CISC type of General purpose processor Intel 8086 Microprocessor.					2						2		**Added**	The objective of this course is to understand and analyze the architectural features of various General purpose processors

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		12	CO 2	Able to understand and analyze the architectural features of CISC type of microcontroller - Intel 8051 Microcontroller.					2					2						
		13	CO 3	Able to understand and analyze the architectural features of RISC type of microcontroller – PIC Microcontroller.					2					2						
		14	CO 4	Able to program 8086 microprocessor, 8051 and PIC microcontrollers in assembly language using TASM, KEIL, MPLAB and Proteus tools.					2					2						
		15	CO 5	Able to Develop a real time application					2					2						

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				using 8051 & PIC Microcontrollers through project based labs.														
15EM3104	COMMUNICATION SYSTEMS	16	CO1	To Understand the basics of Modulation and demodulation techniques, Different types of filtering techniques and Radio Receiver characteristics.		2								2		**Modified**	The objective of this course is to Understand the basics of communication systems
		17	CO2	To Understand the sampling techniques and signal to noise ratio of different pulse modulation schemes.		2								2			
		18	CO3	To Design the Digital Modulation schemes, bandwidth estimation and clock recovery.		2								2			
		1	CO	To		2								2			

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		9	4	Understand the source coding techniques and estimate the error detection and correction of different block codes														
		20	CO 5	Able to design receivers used for Digital communication system using project based labs		2								2				
15EM3105	INTERNET PROGRAMMING	21	CO 1	Able to create Static Web pages using basic HTML & apply CSS					2					3		**Modified**	The objective of this course is to create dynamic web pages using servlets & JSP
		22	CO 2	Able to apply javascript features for form validations and event handling					2					3				
		23	CO 3	Able to create databases using MYSQL and apply					2					3				

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				JDBC concepts to connect to a database.													
		24	CO 4	Able to create dynamic web pages using servlets & JSP				2					3				
		25	CO 5	Must be able to design WEB site considering the user interface, navigation and interaction with database using project based LABS				2					3				
15 EM 3206	VLSI DESIGN	26	CO 1	To understand the VLSI fabrication process and to be able to interact with integrated circuit process engineers		2							3		**Modified**	The objective of this course is to Understand design methodologies to design different PLD architectures	
		27	CO 2	Able to analyze Circuit Characterization ,Performan		2							3				

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				ce Estimation and Fault Testing.															
		28	CO 3	Able to Understand Full-custom & Semi Custom design methodologies to design different PLD architectures.		2									3				
		29	CO 4	Analyze different CPLD and FPGA architectures		2									3				
		30	CO 5	Able to design and simulate digital circuits using Verilog HDL through project based LAbs		2									3				
15EM3251	ADVANCED EMBEDDED PROCESSOR ARCHITECTURES	31	CO 1	Able to understand and analyze the 3 and 5 stage pipelines of ARM and able to program									2			1	**Modified**	The objective of this course is to understand and analyze the characteristics of ARM Processor	

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				the ARM processor.														
		32	CO 2	Able to program the on chip & off chip peripherals of ARM 7 controller.								2			1			
		33	CO 3	Understand and analyze the AMBA bus architecture and different advanced ARM cores.								2			1			
		34	CO 4	Able to analyze the different SOC applications using ARM cores.								2			1			
15EM4157	HARDWARE SOFTWARE CO-DESIGN	35	CO 1	Understand and Analyze the co-design models like FSM, DFG and target architectures and use the tools required for designing the hardware and									2		1	**Modified**	The objective of this course is to Understand and Analyze the tools required for designing the hardware and software models	

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				software models														
		36	CO 2	Analyze Validation and Verification Techniques, design specification for embedded processor architectures									2		1			
		37	CO 3	Analyze the compilation techniques and tools for embedded processor architectures									2		1			
		38	CO 4	Understand the standard design methods like COSYMA system and LYCOS systems.									2		1			
15EM3252	SENSORS AND SENSING PRINCIPLES	39	CO 1	Able to understand and analyze the sensor fundamentals, principles and characteris									2	2			**Added**	The objective of this course is to understand and analyze the sensor fundamentals, principles and characteristics

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				tics													
		40	CO 2	Understand the application of various physical and Chemical sensors								2	2				
		41	CO 3	Understand the application of various optical sensors								2	2				
		42	CO 4	Able to understand the different bio sensors and its limitations.								2	2				
15EM4158	WIRELESS COMMUNICATIONS & NETWORKS	43	CO 1	Able to understand Transmission fundamentals and communications networks and application protocol architecture								2	2		**Added**	The objective of this course is to understand fundamentals of wireless communications networks	
		44	CO 2	Able to understand and analyze signal encoding techniques, spectrum and different								2	2				

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				wireless networks															
		45	CO 3	Able to understand and analyze various principles of cellular wireless networks										2	2				
		46	CO 4	Able to understand wireless protocols and applications of IEEE802.11 architecture and standards										2	2				
15EM4159	WIRELESS SENSOR NETWORKS	47	CO 1	Able to understand Cellular and adhoc networks in detail										2		2		**Added**	The objective of this course is to understand wireless sensor networks data communications
		48	CO 2	Able to understand wireless sensor networks data communications to other networks which involves its design and principles										2		2			
		4	CO	Able to										2		2			

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		9	3	understand various MAC protocols for sensor networks															
		50	CO 4	Able to understand and analyze various routing techniques of wsn and ad hoc networks										2		2			
15 EM 4160	SENSOR NETWORKS PROGRAMMING	51	CO 1	Able to understand fundamentals of TinyOS and nesC in wsn environment.										2		1	**Added**	The objective of this course is to understand and develop energy efficient algorithms for wireless sensor networks	
		52	CO 2	Able to understand real world programming of wireless sensor network in different scenarios.										2		1			
		53	CO 3	Able to understand the performance analysis of power-aware algorithms										2		1			
		54	CO 4	Able to understand and										2		1			

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				develop energy efficient algorithms for wireless sensor networks thru simulation or real time experiments															
15EM4163	ENTERPRISE PROGRAMMING	55	CO1	Must acquire theoretical knowledge related to enterprise architectures, development platforms, Application servers, EJB components, EJB query language.									**2**	**2**	**1**		**Modified**	The objective of this course is to develop real life Enterprise wide application based on EJB
		56	CO2	Must be hands-on developing EJB components using NETBEANS and deploy the components using JBOSS									**2**	**2**	**1**			
		57	CO3	Able to understand									**2**	**2**	**1**			

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				EJB QL & develop sample applications													
		58	CO 4	Must develop real life Enterprise wide application based on EJB and JBOSS and SQL server as DBMS engine									2	2	1		
15 GN 1001	ECOLOGY AND ENVIRONMENT	59	CO 1	Understand the importance of Environmental education and conservation of natural resources.								1, 2	1			**Modified**	The objective of this course is to Understand the importance of Environmental education and conservation of natural resources.
		60	CO 2	Understand the importance of ecosystems and biodiversity.								1, 2	1				
		61	CO 3	Apply the environmental science knowledge on solid waste management, disaster								1, 3	1				

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				management and EIA process.															
15GN1002	HUMAN VALUES	62	CO1	Understand and identify the basic aspiration of human beings						1,2							**Modified**	The objective of this course is to Understand and identify the basic aspiration of human beings
		63	CO2	Envisage the roadmap to fulfill the basic aspiration of human beings.						1,2								
		64	CO3	Analyze the profession and his role in this existence.						1,2								
15EN1101	RUDIMENTS OF COMMUNICATION SKILLS	65	CO1	Remember speech sounds and apply stress and intonation rules to enhance pronunciation skills.							1						**Modified**	The objective of this course is to Understand writing strategies and apply those by using the basic and advanced concepts of grammar.
		66	CO2	Understand writing strategies and apply those by using the basic and advanced concepts of grammar.							1							

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		67	CO 3	Understand the types of texts and tone of the author.							1								
		68	CO 4	Understand the importance of interpersonal skills							1								
15 EN 1202	INTERPERSONAL COMMUNICATION SKILLS	69	CO 1	Understand the method of identifying the meaning of words from the context and form sentences using words.							2						**Modified**	The objective of this course is to Understand and analyze reading techniques and Writing Strategies	
		70	CO 2	Understand and analyze seven types of reading techniques and improve reading speed.							2								
		71	CO 3	Understand and apply writing strategies for office/ formal communication.							2								
		72	CO 4	Understand and					1										

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				analyze different cultures and the importance of empathy in cross-cultural communication.														
15EN2103	PROFESSIONAL COMMUNICATION SKILLS	73	CO1	Understand the concept of Group Discussion and listen and speak effectively during the discussion.							1					**Modified**	The objective of this course is to Understand the concept of Group Discussion and application of presentation skills.
		74	CO2	Understand and improve learners' competency in competitive English and apply the principles of grammar in real life contexts.							2						
		75	CO3	Understand skimming & scanning, and apply the types of reasoning in comprehen							3						

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				ding the informatio n.													
		76	CO 4	Understan d the mechanics and application of presentatio n skills.						1							
15 EN 220 4	EMPL OYAB ILITY SKILL S	77	CO 1	Analyze one's own strength as a speaker/ Communic ator and use discretion while listening.						2					**Modified**	The objective of this course is to analyze various concepts of reading ,writing strategies in professional communication skills	
		78	CO 2	Apply and analyze various concepts of writing strategies in profession al communic ation skills like, reports, resume and minutes of the meeting.						3							
		79	CO 3	Understan d the organizatio n of the passage and also analyze the						2							

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				tone, attitude and style of the author.															
		80	CO 4	Acquire knowledge of and apply people skills in various social organizational and corporate ambiences.								2							
15EN3105	VERBAL AND QUANTITATIVE REASONING	81	CO 1	Understand the method of identifying synonyms and antonyms and analyze the meaning of a word from the context.									1				**Modified**	The objective of this course is to Analyze issues and arguments in the process of critical reasoning	
		82	CO 2	Analyze issues and arguments in the process of critical reasoning and apply grammar rules to correct sentences.									1						
		83	CO 3	Apply the Concepts of basic Algebra									1						

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				and their importance while solving the problems													
		84	CO 4	Apply the short-cut methods on the concepts of different models in Calendars, Clocks, Blood relations and various types of arrangements.								1					
15 MT 2005	PROBABILITY AND STOCHASTIC MODELS	85	1	Construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance					2							**Modified**	The objective of this course is to understand the basics of probability methods
		86	2	Predict the relationship between two variables and construct the linear and non-linear					2								

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				regression lines for the given data														
		87	3	Model the Single and multi server markovian queuing models with finite and infinite capacity.	**2**													
		88	4	Verify and validate the simulation models.							**2**							
		89	5	Verify the solution of problems through MATLAB/ MINITAB.							**2**							
15 MT 1001	SINGLE VARIABLE CALCULUS AND MATRIX ALGEBRA	90	CO -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**									**Modified**			The objective of this course is to understand the concepts of calculus and matrix algebra	
		91	CO -2	Formulate physical laws and	**1**													

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				relations mathematically in the form of second/higher order differential equations and identify a method for solving and interpreting the results.															
		92	CO-3	Provide solutions for Fourier series of periodic/non-periodic phenomenon in models involving differential equations.					1										
		93	CO-4	Apply numeric solution methods for a system of linear algebraic equations and application oriented matrix eigenvalue problems.					1										
		94	CO-5	Verify the solution of problems											1				

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				through MATLAB.														
15 MT 1203	MULTI VARIATE CALCULUS	95	CO 1	Determine the maximum and minimum values for the function involving two variables					2							**Modified**	The objective of this course is to Understand the concepts of multi variable calculus
		96	CO 2	Calculate the length of the arc, area, volume of the surface of a solid revolution					2								
		97	CO 3	Model the given phenomena as a partial differential equations of first and second orders											2		
		98	CO 4	Solve the partial differential equations by analytical and finite difference methods					2								
		99	CO 5	Verify the solution of problems through MATLAB.											2		

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1 0 1	2	To appropriately choose, define and / or to derive probabibility distributions such as the Binomial, Poisson and normal etc. to model and solve engineering problems	**2**	**2**
1 0 2	3	To understand how regression analysis canbe used to develop an equation that estimate how two variables are related and how the analysis of variance procedure can be used to determine it means of two papulation are equal	**2**	**2**
1	4	To have	**2**	**2**

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		03		through knowledge on linear and non linear programming														
		104																
15ME1001	MECHANICS	105	CO1	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												**Modified**	The objective of this course is to understand the basics concepts of mechanics
		106	CO2	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													

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		107	CO 3	Analyzing the rigid bodies under translation and rotation with and without considering forces.					1									
		108	CO 4	Understanding the engineering mechanics physical systems prepare and demonstrate the models with the help of mechanics concepts to solve the engineering problems					1									
		109	CO 5	Apply the concepts of mechanics and carryout different experiments and analyze the results		2												
15PH1001	ENGINEERING MATERIALS	110	CO 1	Understand the concepts of crystallography and			1									**Modified**	The objective of this course is to Understand the concepts of basic	

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				crystalline imperfections in order to determine crystal structures and to identify defects in crystals													engineering materials
		111	CO 2	Understand electrical and optical properties of materials and apply them to know various mechanisms involved in electrical, electronic, optical, optoelectronic devices.			**1**										
		112	CO 3	Understand mechanical and thermal properties of materials and apprehend their importance in identification of materials			**1**										

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				for specific engineering application s														
		113	CO 4	Understand magnetic properties of materials and apply them to know various mechanisms involved in magnetic memory devices and transformers.				1										
15CY1001	ENGINEERING CHEMISTRY	114	CO -1	Predict potential complications from combining various chemicals or metals in an engineering setting.				1									**Modified**	The objective of this course is to Understand the basic concepts of engineering chemistry
		115	CO -2	Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena.				1										

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		116	CO-3	Examine water quality and select appropriate purification technique for intended problem.				1											
		117	CO-4	Apply phase rule, polymers, conducting polymers and nano chemistry to engineering processes.					1										
		118	CO-5	An ability to analyze & generate experimental skills.					1										
15BT1001	BIOLOGY FOR ENGINEERS	119	CO-1	Acquire the Knowledge of basic biology									1		2			**Added**	The objective of this course is to Acquire the Knowledge of basic biology
		120	CO-2	Acquire the Knowledge of Human Biological Systems									1		2				
		121	CO-3	Acquire Knowledge on Microorganisms and Biosensors									1		2				
15	FIELD	1	1	Understan	1											1		**Modified**	The objective

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EE 1201	S & NETWORKS	22		d the circuit elements, kirchhoff's law and theorems to solve the networks													of this course is to Understand the basics of circuit elements
		123	2	Apply the procedure to determine form factor and peak factor to different symmetrical & unsymmetrical waves.	2												
		124	3	Apply vector algebra to field fundaments als to analyze electric and magnetic field distributions	2												
		125	4	Apply Maxwell's equations for static and time varying fields	2												
		126	5	Test and Analyze the concepts learned in	2												

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				fields and networks by conducting experiments or by any simulation softwares													
15 GN 100 4	INTRODUCTION TO ENGINEERING	127	CO-1	Understand the basic principles of engineering design								1				**Added**	The objective of this course is to Understand the basic principles of engineering design
		128	CO-2	Understand the aspects of critical thinking and problem solving in engineering								2					
		129	CO-3	Apply to knowledge of critical thinking to frame real-world problems and provide basic solution approach to such problems from engineering perspective								2					
		130	CO-4	Understand and analyze the						3							

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				possible career options in Engineering and develop strategic plan, career targets and mechanism to achieve the same.														
15CS1001	C PROGRAMMING & DATA STRUCTURES	131	CO-1	Illustrate how problems are solved using computers and programming.	2												**Modified**	The objective of this course is to Solve real world problems using C programming
		132	CO-2	Interpret & Illustrate user defined C functions and different operations on list of data.	2													
		133	CO-3	Implement Linear Data Structures and compare them.					2									
		134	CO-4	Implement Binary Trees.					2									
		135	CO-5	Apply the knowledge obtained by the											2			

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				course to solve real world problems.														
15 ME 1002	ENGINEERING GRAPHICS	136	CO-1	Draft orthographic Projections, Isometric views ,projection of planes, Manually and prepare Models in workshop by using drawings.											2	**Modified**	The objective of this course is to Use AutoCAD and prepare Models in workshop
		137	CO-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		
		138	CO-3	Draft Developm ent of											2		

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				surfaces of solid and sections of solid Manually														
		139	CO-4	Practicing house wiring through Auto Cad											2			
		140	CO-5	Develop 2D & 3D components using Auto Cad Software		2												
15GN1003	MEASUREMENTS	141	CO-1	Understand and apply the fundamentals of a measurement system, characteristics, and metrology using simulation and experimentation tools.	2	2										**Modified**	The objective of this course is to Understand fundamentals of a measurement system and experimentation tools.	
		142	CO-2	Understand various electrical & computer parameters, and apply different measuring techniques on various electrical parameters using simulation	2	2												

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				and experimentation tools.					
		143	CO-3	Understand electronic & electro-physiological parameters, and apply measuring techniques on electronic parameters using simulation and experimentation tools. 2	2				
		144	CO-4	Understand and apply different measuring techniques on civil and mechanical parameters using simulation and experimentation tools. 2	2				
		145	CO-5	Apply the theoretical concepts to measure different parameters2					
15 CS 2002	OBJECT ORIENTED	146	CO 1	Understand Basic Concepts of OOP,			2	**Modified**	The objective of this course is to Understand

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	PROGRAMMING			introduction to classes and objects through Java Language and apply.														Basic Concepts of OOP and develop real world applications using Java
		147	CO 2	Understand the concepts of constructors, Overloading, parameter passing, access control, Inheritance and apply.					2									
		148	CO 3	Understand Packages, Interfaces, and Exception Handling and apply.					2									
		149	CO 4	Understand I/O Streams & apply and understand Basic Concepts of Multi - Threading											3			
		150	CO 5	Apply OOP concepts for developing an application											3			
15 EC	SIGNAL	15	CO 1	Demonstrate signals	2												**Added**	The objective of this course is

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2002	ANALYSIS	1		and their Spectra															to Analyze various types of Signals
		152	CO 2	Analyze discrete time systems	2														
		153	CO 3	Design filters to cater signal analysis needs												2			
		154	CO 4	Analyze non stationary signals in time												2			
		155	CO 5	Analyze non stationary signals in frequency domains												2			
15CS2003	DISCRETE MATHEMATICS	156	CO 1	Understand sets, relations, functions and discrete structures , Count discrete event occurrences	2													Modified	The objective of this course is to Understand the basic concepts of discrete mathematics
		157	CO 2	Apply Propositional logic and First order logic to solve problems	2														
		158	CO 3	Formulate and solve recurrence												2			

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				relations, apply algebraic structures and lattices.														
		159	CO 4	To identify the basic properties of graphs and trees and model simple applications											2			
		160	CO 5	Relate practical examples to the appropriate set,function or relation model and interpret the associated operations and terminology in context											2			
15CS2206	OPERATING SYSTEMS	161	CO 1	Develop algorithms for subsystem components		2											**Modified**	The objective of this course is to Understand the basic concepts related to operating systems
		162	CO 2	Understand process and memory virtualization		2												

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		163	CO 3	understand persistence concepts		2													
		164	CO 4	Design and solve synchronization problems , and multi threading libraries												3			
		165	CO 5	Develop application programs using UNIX system calls												3			
15CS2208	COMPUTER NETWORKS	166	CO 1	Understand OSI and TCP/IP models												2	**Modified**	The objective of this course is to Understand the basics of computer networks	
		167	CO 2	Analyze MAC layer protocols and LAN technologies					2										
		168	CO 3	Implement routing and congestion control algorithms					2							2			
		169	CO 4	Understand application layer concepts					2										
		170	CO 5	Design applications using internet protocols												2			

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15	SIGNAL PROCESSING	171	CO 1	Understand various signals and model physical process using them.					2							Modified	The objective of this course is to Understand various signals and model physical process using them.
		172	CO 2	Acquaint with various a transformation methods and their potential for applicability in various signal analysis conditions					2								
		173	CO 3	Demonstrate sampling and its potential applications in communications, discrete signal acquisition etc.,.					2								
		174	CO 4	Evaluate discrete system behavior and its response to facilitate system design.					2								

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		175	CO 5	Design a low pass discrete time system to meet noise elimination like application s					2					3				
		176	CO 6	Analyze non stationary signals and analyze them in both time frequency domains.					2					3				
15 EM 30 B1	LINUX PROGRAMMING	177	CO 1	Describe and understand the fundamental LINUX operating system and utilities	2				2							Added	The objective of this course is to understand the fundamental LINUX operating system and utilities		
		178	CO 2	apply shell scripts in order to perform basic shell Programming and analyze the Linux file system										2					

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Annexure-1

COURSE VS SOS & PSO'S MAPPING

Course Code	Course Title	SNO	CO NO	Description of the Course Outcome	a	b	c	d	e	f	g	h	i	j	k	Course Type	Course Objective
15EM3103	EMBEDDED SYSTEMS	1	CO 1	Able to analyze embedded systems, analyze and program on chip peripherals for a single purpose controller			2								3	Modified	The objective of this course is to understand the basic concepts and develop a prototype for a real time embedded application
		2	CO 2	Able to interface and program different off chip peripherals and communication protocols used in embedded systems			2								3		
		3	CO 3	Able to understand, evaluate and select appropriate software architectures			2								3		
		4	CO 4	Able to analyze and design			2								3		

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				systems using the features in real time operating systems.													
		5	CO 5	Able to develop a prototype for a real time embedded application using project based labs.			2								3		
15 EM 2001	COMPUTER ORGANIZATION AND ARCHITECTURE	6	CO 1	Understand the functionality and design the CPU functional units - control unit, registers, the arithmetic and logic unit, the instruction execution unit, and the interconnections among these components.			2								3	**Modified**	The objective of this course is to Understand the functionality and design the CPU and its functional units
		7	CO 2	Understand, analyze and design main, cache and			2								3		

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				virtual memory organizations.															
		8	CO 3	Understand, analyze and design different types of I/O transfer techniques.			2								3				
		9	CO 4	Understand the design issues of RISC and CISC CPUs and the design issues of pipeline architectures.			2								3				
		10	CO 5	Able to Design combinational and sequential circuits using LOGISIM			2								3				
15EM2202	PROCESSORS AND CONTROLLERS	11	CO 1	Able to understand and analyze the architectural features of CISC type of General purpose processor Intel 8086 Microprocessor.					2						2		**Added**	The objective of this course is to understand and analyze the architectural features of various General purpose processors	

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		12	CO 2	Able to understand and analyze the architectural features of CISC type of microcontroller - Intel 8051 Microcontroller.					2					2						
		13	CO 3	Able to understand and analyze the architectural features of RISC type of microcontroller – PIC Microcontroller.					2					2						
		14	CO 4	Able to program 8086 microprocessor, 8051 and PIC microcontrollers in assembly language using TASM, KEIL, MPLAB and Proteus tools.					2					2						
		15	CO 5	Able to Develop a real time application					2					2						

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				using 8051 & PIC Microcontrollers through project based labs.															
15EM3104	COMMUNICATION SYSTEMS	16	CO1	To Understand the basics of Modulation and demodulation techniques, Different types of filtering techniques and Radio Receiver characteristics.		2									2		**Modified**	The objective of this course is to Understand the basics of communication systems
		17	CO2	To Understand the sampling techniques and signal to noise ratio of different pulse modulation schemes.		2									2				
		18	CO3	To Design the Digital Modulation schemes, bandwidth estimation and clock recovery.		2									2				
		1	CO	To		2									2				

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		9	4	Understand the source coding techniques and estimate the error detection and correction of different block codes																
		20	CO 5	Able to design receivers used for Digital communication system using project based labs		**2**									**2**					
15 EM 3105	INTERNET PROGRAMMING	21	CO 1	Able to create Static Web pages using basic HTML & apply CSS					**2**						**3**		**Modified**	The objective of this course is to create dynamic web pages using servlets & JSP		
		22	CO 2	Able to apply javascript features for form validations and event handling					**2**						**3**					
		23	CO 3	Able to create databases using MYSQL and apply					**2**						**3**					

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				JDBC concepts to connect to a database.															
		24	CO 4	Able to create dynamic web pages using servlets & JSP					2						3				
		25	CO 5	Must be able to design WEB site considering the user interface, navigation and interaction with database using project based LABS					2						3				
15 EM 3206	VLSI DESIGN	26	CO 1	To understand the VLSI fabrication process and to be able to interact with integrated circuit process engineers		2									3		**Modified**	The objective of this course is to Understand design methodologies to design different PLD architectures	
		27	CO 2	Able to analyze Circuit Characterization ,Performan		2									3				

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				ce Estimation and Fault Testing.															
		28	CO 3	Able to Understand Full-custom & Semi Custom design methodologies to design different PLD architectures.		2									3				
		29	CO 4	Analyze different CPLD and FPGA architectures		2									3				
		30	CO 5	Able to design and simulate digital circuits using Verilog HDL through project based LAbs		2									3				
15EM3251	ADVANCED EMBEDDED PROCESSOR ARCHITECTURES	31	CO 1	Able to understand and analyze the 3 and 5 stage pipelines of ARM and able to program									2			1	**Modified**	The objective of this course is to understand and analyze the characteristics of ARM Processor	

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				the ARM processor.														
		32	CO 2	Able to program the on chip & off chip peripherals of ARM 7 controller.								2			1			
		33	CO 3	Understand and analyze the AMBA bus architecture and different advanced ARM cores.								2			1			
		34	CO 4	Able to analyze the different SOC applications using ARM cores.								2			1			
15 EM 4157	HARDWARE SOFTWARE CO-DESIGN	35	CO 1	Understand and Analyze the co-design models like FSM, DFG and target architectures and use the tools required for designing the hardware and									2		1	**Modified**	The objective of this course is to Understand and Analyze the tools required for designing the hardware and software models	

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				software models														
		36	CO 2	Analyze Validation and Verification Techniques, design specification for embedded processor architectures									2		1			
		37	CO 3	Analyze the compilation techniques and tools for embedded processor architectures									2		1			
		38	CO 4	Understand the standard design methods like COSYMA system and LYCOS systems.									2		1			
15 EM 3252	SENSORS AND SENSING PRINCIPLES	39	CO 1	Able to understand and analyze the sensor fundamentals, principles and characteris									2	2			**Added**	The objective of this course is to understand and analyze the sensor fundamentals, principles and characteristics

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				tics													
		40	CO 2	Understand the application of various physical and Chemical sensors									2	2			
		41	CO 3	Understand the application of various optical sensors									2	2			
		42	CO 4	Able to understand the different bio sensors and its limitations.									2	2			
15 EM 4158	WIRELESS COMMUNICATIONS & NETWORKS	43	CO 1	Able to understand Transmission fundamentals and communications networks and application protocol architecture									2	2		**Added**	The objective of this course is to understand fundamentals of wireless communications networks
		44	CO 2	Able to understand and analyze signal encoding techniques, spectrum and different									2	2			

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				wireless networks													
		45	CO 3	Able to understand and analyze various principles of cellular wireless networks									2	2			
		46	CO 4	Able to understand wireless protocols and applications of IEEE802.11 architecture and standards									2	2			
15 EM 4159	WIRELESS SENSOR NETWORKS	47	CO 1	Able to understand Cellular and adhoc networks in detail									2		2	**Added**	The objective of this course is to understand wireless sensor networks data communications
		48	CO 2	Able to understand wireless sensor networks data communications to other networks which involves its design and principles									2		2		
		4	CO	Able to									2		2		

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		9	3	understand various MAC protocols for sensor networks													
		50	CO 4	Able to understand and analyze various routing techniques of wsn and ad hoc networks									2		2		
15 EM 4160	SENSOR NETWORKS PROGRAMMING	51	CO 1	Able to understand fundamentals of TinyOS and nesC in wsn environment.									2		1	**Added**	The objective of this course is to understand and develop energy efficient algorithms for wireless sensor networks
		52	CO 2	Able to understand real world programming of wireless sensor network in different scenarios.									2		1		
		53	CO 3	Able to understand the performance analysis of power-aware algorithms									2		1		
		54	CO 4	Able to understand and									2		1		

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				develop energy efficient algorithms for wireless sensor networks thru simulation or real time experiments													
15 EM 4163	ENTERPRISE PROGRAMMING	55	CO 1	Must acquire theoretical knowledge related to enterprise architectures, development platforms, Application servers, EJB components, EJB query language.									2	2	1	**Modified**	The objective of this course is to develop real life Enterprise wide application based on EJB
		56	CO 2	Must be hands-on developing EJB components using NETBEANS and deploy the components using JBOSS									2	2	1		
		57	CO 3	Able to understand									2	2	1		

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				EJB QL & develop sample applications													
		58	CO 4	Must develop real life Enterprise wide application based on EJB and JBOSS and SQL server as DBMS engine									2	2	1		
15 GN 1001	ECOLOGY AND ENVIRONMENT	59	CO 1	Understand the importance of Environmental education and conservation of natural resources.								1, 2	1			**Modified**	The objective of this course is to Understand the importance of Environmental education and conservation of natural resources.
		60	CO 2	Understand the importance of ecosystems and biodiversity.								1, 2	1				
		61	CO 3	Apply the environmental science knowledge on solid waste management, disaster								1, 3	1				

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				management and EIA process.														
15 GN 1002	HUMAN VALUES	62	CO 1	Understand and identify the basic aspiration of human beings						1, 2						**Modified**	The objective of this course is to Understand and identify the basic aspiration of human beings
		63	CO 2	Envisage the roadmap to fulfill the basic aspiration of human beings.						1, 2							
		64	CO 3	Analyze the profession and his role in this existence.						1, 2							
15 EN 1101	RUDIMENTS OF COMMUNICATION SKILLS	65	CO 1	Remember speech sounds and apply stress and intonation rules to enhance pronunciation skills.							1					**Modified**	The objective of this course is to Understand writing strategies and apply those by using the basic and advanced concepts of grammar.
		66	CO 2	Understand writing strategies and apply those by using the basic and advanced concepts of grammar.							1						

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		67	CO 3	Understand the types of texts and tone of the author.							1								
		68	CO 4	Understand the importance of interpersonal skills							1								
15 EN 1202	INTERPERSONAL COMMUNICATION SKILLS	69	CO 1	Understand the method of identifying the meaning of words from the context and form sentences using words.							2						**Modified**	The objective of this course is to Understand and analyze reading techniques and Writing Strategies	
		70	CO 2	Understand and analyze seven types of reading techniques and improve reading speed.							2								
		71	CO 3	Understand and apply writing strategies for office/ formal communication.							2								
		72	CO 4	Understand and					1										

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				analyze different cultures and the importance of empathy in cross-cultural communication.															
15EN2103	PROFESSIONAL COMMUNICATION SKILLS	73	CO1	Understand the concept of Group Discussion and listen and speak effectively during the discussion.							1						**Modified**	The objective of this course is to Understand the concept of Group Discussion and application of presentation skills.
		74	CO2	Understand and improve learners' competency in competitive English and apply the principles of grammar in real life contexts.							2								
		75	CO3	Understand skimming & scanning, and apply the types of reasoning in comprehen							3								

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				ding the informatio n.														
		76	CO 4	Understan d the mechanics and application of presentatio n skills.							1							
15 EN 220 4	EMPL OYAB ILITY SKILL S	77	CO 1	Analyze one's own strength as a speaker/ Communic ator and use discretion while listening.							2						**Modified**	The objective of this course is to analyze various concepts of reading ,writing strategies in professional communication skills
		78	CO 2	Apply and analyze various concepts of writing strategies in profession al communic ation skills like, reports, resume and minutes of the meeting.							3							
		79	CO 3	Understan d the organizatio n of the passage and also analyze the							2							

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				tone, attitude and style of the author.															
		80	CO 4	Acquire knowledge of and apply people skills in various social organizational and corporate ambiences.						2									
15 EN 3105	VERBAL AND QUANTITATIVE REASONING	81	CO 1	Understand the method of identifying synonyms and antonyms and analyze the meaning of a word from the context.									1				**Modified**	The objective of this course is to Analyze issues and arguments in the process of critical reasoning	
		82	CO 2	Analyze issues and arguments in the process of critical reasoning and apply grammar rules to correct sentences.									1						
		83	CO 3	Apply the Concepts of basic Algebra									1						

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				and their importance while solving the problems														
		84	CO 4	Apply the short-cut methods on the concepts of different models in Calendars, Clocks, Blood relations and various types of arrangements.								1						
15 MT 2005	PROBABILITY AND STOCHASTIC MODELS	85	1	Construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance					2							**Modified**	The objective of this course is to understand the basics of probability methods	
		86	2	Predict the relationship between two variables and construct the linear and non-linear					2									

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				regression lines for the given data														
		87	3	Model the Single and multi server markovian queuing models with finite and infinite capacity.	2													
		88	4	Verify and validate the simulation models.							2							
		89	5	Verify the solution of problems through MATLAB/ MINITAB.							2							
15 MT 100 1	SINGLE VARIABLE CALCULUS AND MATRIX ALGEBRA	90	CO-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												**Modified**	The objective of this course is to understand the concepts of calculus and matrix algebra
		91	CO-2	Formulate physical laws and	1													

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				relations mathematically in the form of second/higher order differential equations and identify a method for solving and interpreting the results.																			
		92	CO-3	Provide solutions for Fourier series of periodic/non-periodic phenomenon in models involving differential equations.					1														
		93	CO-4	Apply numeric solution methods for a system of linear algebraic equations and application oriented matrix eigenvalue problems.					1														
		94	CO-5	Verify the solution of problems											1								

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				through MATLAB.														
15 MT 1203	MULTI VARIATE CALCULUS	95	CO 1	Determine the maximum and minimum values for the function involving two variables					2								**Modified**	The objective of this course is to Understand the concepts of multi variable calculus
		96	CO 2	Calculate the length of the arc, area, volume of the surface of a solid revolution					2									
		97	CO 3	Model the given phenomena as a partial differential equations of first and second orders												2		
		98	CO 4	Solve the partial differential equations by analytical and finite difference methods					2									
		99	CO 5	Verify the solution of problems through MATLAB.												2		

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1 0 1	2	To appropriately choose, define and / or to derive probabibility distributions such as the Binomial, Poisson and normal etc. to model and solve engineering problems	**2**	**2**	
1 0 2	3	To understand how regression analysis canbe used to develop an equation that estimate how two variables are related and how the analysis of variance procedure can be used to determine it means of two papulation are equal	**2**	**2**	
1	4	To have	**2**	**2**	

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		03		through knowledge on linear and non linear programming															
		104																	
15ME1001	MECHANICS	105	CO1	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												**Modified**	The objective of this course is to understand the basics concepts of mechanics
		106	CO2	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														

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		107	CO 3	Analyzing the rigid bodies under translation and rotation with and without considering forces.					1									
		108	CO 4	Understanding the engineering mechanics physical systems prepare and demonstrate the models with the help of mechanics concepts to solve the engineering problems					1									
		109	CO 5	Apply the concepts of mechanics and carryout different experiments and analyze the results		2												
15PH1001	ENGINEERING MATERIALS	110	CO 1	Understand the concepts of crystallography and			1									**Modified**	The objective of this course is to Understand the concepts of basic	

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				crystalline imperfections in order to determine crystal structures and to identify defects in crystals													engineering materials
		111	CO 2	Understand electrical and optical properties of materials and apply them to know various mechanisms involved in electrical, electronic, optical, optoelectronic devices.			1										
		112	CO 3	Understand mechanical and thermal properties of materials and apprehend their importance in identification of materials			1										

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				for specific engineering application s																	
		113	CO 4	Understand magnetic properties of materials and apply them to know various mechanisms involved in magnetic memory devices and transformers.				1													
15CY1001	ENGINEERING CHEMISTRY	114	CO -1	Predict potential complications from combining various chemicals or metals in an engineering setting.				1											**Modified**	The objective of this course is to Understand the basic concepts of engineering chemistry	
		115	CO -2	Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena.				1													

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		116	CO-3	Examine water quality and select appropriate purification technique for intended problem.			1													
		117	CO-4	Apply phase rule, polymers, conducting polymers and nano chemistry to engineering processes.				1												
		118	CO-5	An ability to analyze & generate experimental skills.				1												
15BT1001	BIOLOGY FOR ENGINEERS	119	CO-1	Acquire the Knowledge of basic biology								1		2				**Added**	The objective of this course is to Acquire the Knowledge of basic biology
		120	CO-2	Acquire the Knowledge of Human Biological Systems								1		2						
		121	CO-3	Acquire Knowledge on Microorganisms and Biosensors								1		2						
15	FIELD	1	1	Understan	1											1		**Modified**	The objective	

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EE 1201	S & NETWORKS	22		d the circuit elements, kirchhoff's law and theorems to solve the networks													of this course is to Understand the basics of circuit elements
		123	2	Apply the procedure to determine form factor and peak factor to different symmetrical & unsymmetrical waves.	2												
		124	3	Apply vector algebra to field fundaments als to analyze electric and magnetic field distributions	2												
		125	4	Apply Maxwell's equations for static and time varying fields	2												
		126	5	Test and Analyze the concepts learned in	2												

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				fields and networks by conducting experiments or by any simulation softwares													
15 GN 100 4	INTRODUCTION TO ENGINEERING	127	CO -1	Understand the basic principles of engineering design								1				**Added**	The objective of this course is to Understand the basic principles of engineering design
		128	CO -2	Understand the aspects of critical thinking and problem solving in engineering								2					
		129	CO -3	Apply to knowledge of critical thinking to frame real-world problems and provide basic solution approach to such problems from engineering perspective								2					
		130	CO -4	Understand and analyze the						3							

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				possible career options in Engineering and develop strategic plan, career targets and mechanism to achieve the same.															
15CS1001	C PROGRAMMING & DATA STRUCTURES	131	CO-1	Illustrate how problems are solved using computers and programming.	2												**Modified**	The objective of this course is to Solve real world problems using C programming
		132	CO-2	Interpret & Illustrate user defined C functions and different operations on list of data.	2													
		133	CO-3	Implement Linear Data Structures and compare them.					2									
		134	CO-4	Implement Binary Trees.					2									
		135	CO-5	Apply the knowledge obtained by the											2			

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				course to solve real world problems.														
15 ME 1002	ENGINEERING GRAPHICS	136	CO-1	Draft orthographic Projections, Isometric views ,projection of planes, Manually and prepare Models in workshop by using drawings.											2	**Modified**	The objective of this course is to Use AutoCAD and prepare Models in workshop
		137	CO-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		
		138	CO-3	Draft Developm ent of											2		

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				surfaces of solid and sections of solid Manually														
		139	CO-4	Practicing house wiring through Auto Cad										2				
		140	CO-5	Develop 2D & 3D components using Auto Cad Software		2												
15GN1003	MEASUREMENTS	141	CO-1	Understand and apply the fundamentals of a measurement system, characteristics, and metrology using simulation and experimentation tools.	2	2											**Modified**	The objective of this course is to Understand fundamentals of a measurement system and experimentation tools.
		142	CO-2	Understand various electrical & computer parameters, and apply different measuring techniques on various electrical parameters using simulation	2	2												

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				and experimentation tools.					
		143	CO-3	Understand electronic & electro-physiological parameters, and apply measuring techniques on electronic parameters using simulation and experimentation tools.	**2**	2			
		144	CO-4	Understand and apply different measuring techniques on civil and mechanical parameters using simulation and experimentation tools.	**2**	2			
		145	CO-5	Apply the theoretical concepts to measure different parameters		2			
15CS2002	OBJECT ORIENTED	146	CO1	Understand Basic Concepts of OOP,			**2**	**Modified**	The objective of this course is to Understand

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	PROGRAMMING			introduction to classes and objects through Java Language and apply.														Basic Concepts of OOP and develop real world applications using Java
		147	CO 2	Understand the concepts of constructors, Overloading, parameter passing, access control, Inheritance and apply.					2									
		148	CO 3	Understand Packages, Interfaces, and Exception Handling and apply.					2									
		149	CO 4	Understand I/O Streams & apply and understand Basic Concepts of Multi - Threading											3			
		150	CO 5	Apply OOP concepts for developing an application											3			
15 EC	SIGNAL	15	CO 1	Demonstrate signals	2												**Added**	The objective of this course is

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2002	ANALYSIS	1		and their Spectra																to Analyze various types of Signals
		152	CO 2	Analyze discrete time systems	2															
		153	CO 3	Design filters to cater signal analysis needs												2				
		154	CO 4	Analyze non stationary signals in time												2				
		155	CO 5	Analyze non stationary signals in frequency domains												2				
15CS2003	DISCRETE MATHEMATICS	156	CO 1	Understand sets, relations, functions and discrete structures , Count discrete event occurrences	2													Modified	The objective of this course is to Understand the basic concepts of discrete mathematics	
		157	CO 2	Apply Propositional logic and First order logic to solve problems	2															
		158	CO 3	Formulate and solve recurrence												2				

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				relations, apply algebraic structures and lattices.																
		159	CO 4	To identify the basic properties of graphs and trees and model simple applications												2				
		160	CO 5	Relate practical examples to the appropriate set,function or relation model and interpret the associated operations and terminology in context												2				
15CS2206	OPERATING SYSTEMS	161	CO 1	Develop algorithms for subsystem components		2												**Modified**	The objective of this course is to Understand the basic concepts related to operating systems	
		162	CO 2	Understand process and memory virtualization		2														

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		163	CO 3	understand persistence concepts		2												
		164	CO 4	Design and solve synchronization problems , and multi threading libraries											3			
		165	CO 5	Develop application programs using UNIX system calls											3			
15CS2208	COMPUTER NETWORKS	166	CO 1	Understand OSI and TCP/IP models											2	**Modified**	The objective of this course is to Understand the basics of computer networks	
		167	CO 2	Analyze MAC layer protocols and LAN technologies					2									
		168	CO 3	Implement routing and congestion control algorithms					2						2			
		169	CO 4	Understand application layer concepts					2									
		170	CO 5	Design applications using internet protocols											2			

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		171	CO 1	Understand various signals and model physical process using them.					2							**Modified**	The objective of this course is to Understand various signals and model physical process using them.
15 EC AL 220 PROC 6 ESSIN G SIGN		172	CO 2	Acquaint with various a transformation methods and their potential for applicability in various signal analysis conditions					2								
		173	CO 3	Demonstrate sampling and its potential applications in communications, discrete signal acquisition etc.,.					2								
		174	CO 4	Evaluate discrete system behavior and its response to facilitate system design.					2								

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		175	CO 5	Design a low pass discrete time system to meet noise elimination like applications					2					3			
		176	CO 6	Analyze non stationary signals and analyze them in both time frequency domains.					2					3			
15 EM 30 B1	LINUX PROGRAMMING	177	CO 1	Describe and understand the fundamental LINUX operating system and utilities	2				2							**Added**	The objective of this course is to understand the fundamental LINUX operating system and utilities
		178	CO 2	apply shell scripts in order to perform basic shell Programming and analyze the Linux file system										2			

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		175	CO 5	Design a low pass discrete time system to meet noise elimination like applications					2					3			
		176	CO 6	Analyze non stationary signals and analyze them in both time frequency domains.					2					3			
15 EM 30 B1	LINUX PROGRAMMING	177	CO 1	Describe and understand the fundamental LINUX operating system and utilities	2				2							**Added**	The objective of this course is to understand the fundamental LINUX operating system and utilities
		178	CO 2	apply shell scripts in order to perform basic shell Programming and analyze the Linux file system										2			

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Annexure-2

COURSE VS POS & PSO'S MAPPING

	MAPPING OF COs and POs													
	Item Description					Program Outcomes(POs)							Course Type	Course Objective
Course Code	Course Title	L-T-P	CREDITS	CO NO	Description of the Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6			
15EM5101	Microcontrollers for Embedded System Design.	3-0-2	4	CO 1	Understanding the fundamentals of Embedded Systems and its hardware and software architecture.						1		Modified	The objective of this course is to understand working principles of various microcontrollers
				CO 2	Demonstrate the working principle of 8051 microcontrollers and Processor Architecture & Interfacing					2				
				CO 3	Analyze PIC Microcontroller Hardware with its Architecture & Interfacing	2								
				CO 4	Analyze the Device Drivers , Interrupt service Mechanism and Devices & Communication Buses for Devices Network.		2							
15EM5102	Real Time Concepts for Embedded Systems	3-2-0	4	CO 1	Understand the current trends for Embedded Systems Design. Hard versus soft Real- Time Systems, A Reference Model of Real – Time Systems: Processors and	1					1		Modified	The objective of this course is to understand Basics of RTOS used in Embedded systems

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Chairman BOS-ECM

Dr. M. SUMAN
PROFESSOR & HOD
Dept. of Electronics & Computer Engg

Dr. SUMAN
Chairman BOS-ECM

Dr. M. SUMAN
PROFESSOR & HOD
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					Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency etc								
				CO 2	Understand and apply Challenges in validating timing constraints in priority –driven systems Off-line versus On-line Scheduling	1				2			
				CO 3	Analyze Priority-Driven Scheduling of Periodic Tasks, aperiodic tasks, and sporadic tasks with different scheduling mechanisms	2	2						
				CO 4	Understand Real-Time Operating Systems Other Basic Operating System Functions	1							
15EM5103	VLSI Technology & Design	3-0-2	4	CO 1	Understand basic concepts of MOSFET, and study the second order effects in MOS technology concepts.	1						Modified	The objective of this course is to understand CMOS devices, CMOS IC fabrication & CMOS circuits
				CO 2	Understand various forms of CMOS devices, steps involved in CMOS IC fabrication and also the rules to draw stick & layout of CMOS circuits	1							
				CO 3	Apply MOS device concepts for generating transistor level diagrams for digital circuits					2			

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Chairman BOS-ECM

Dr. M. SUMAN
PROFESSOR & HOD
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Chairman BOS-ECM

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				CO 4	Analyze CMOS circuits in terms of area, speed and power dissipation by applying the techniques like transistor sizing & design rules.	2					2		
				CO 5	Evaluate the design parameters (Area, Speed & Power) & driving capacity of CMOS circuits like Multiplexer, Latch e.t.c.		3						
15EM5104	Wireless Communications & Networks	3-2-0	4	CO 1	Understand Mobile and Wireless Landscape,Wireless LAN and IEEE 802.11	1						Modified	The objective of this course is to understand the basics of wireless comm. And standards
				CO 2	Discuss Global System for Mobile Communications (GSM) and Medium Access Control (MAC)		1						
				CO 3	Describe Mobile IP and Mobile Ad hoc Networks (MANETs)					1			
				CO 4	Understand Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP and Mobile TCP.						1		
				CO 5	Understand Broadcast systems(DVB and DAB)	1					1		
15EM5206	Digital Signal Processors and Architectures	3-2-0	4	CO 1	At the end of the course the student will get familiarized with various DSP based Embedded System Applications. Understands the implementation aspects of Computational accuracy of DSP based algorithms	1						Modified	The objective of this course is to understand various DSP based Embedded System Applications.

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CO 2	Understand the architectural features of programmable DSP devices. Student will be familiarised with development process applications based on DSK5416 development board and various development tools used.	1											
CO 3	To familiarize with Texas Instruments' TMS320C54XX family of fixed-point DSP Processors their architectures in-terms of addressing modes, Programming On-Chip Peripherals', Interrupts and Pipeline operations. Student will be getting familiarised with applications development process based on DSK5416 development board and various software development tools used.		1										
CO 4	Student will demonstrate the ability to implement various DSP algorithms used in different Embedded Systems based on TI's TMS320C54XX family of fixed-point DSP Processors			1									
CO 5	Student will demonstrate the ability to implement various DSP based Embedded Systems by interfacing DSPs with Memory, I/O with the help of integration concepts like INTERRUPTS, DMA and CODECs with DSP	1		1									

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					to use A/D and D/A converters for serial I/O.									
15EM5207	Advanced Embedded Systems Design	3-2-0	4	CO 1	To remember and understand the basic concepts of model , Architecture and programming Language	1						Modified	The objective of this course is to understand Modern embedded architectures and compilation technologies
				CO 2	To remember and understand the Hardware software synthesis algorithms and software partitioning distributed system co-synthesis		1						
				CO 3	To understand Architecture Specialization techniques, Architecture for control dominated systems	1					1		
				CO 4	Analyze and apply the techniques of Modern embedded architectures and compilation technologies		2			2			
				CO 5	Analyze concurrency coordinating, concurrent computations and verification tools.	2					2		
15EM5208	Linux System Concepts	3-0-2	4	CO 1	Apply various various GNU development tools for compiling, debugging and creating libraries.		2					MOdified	The objective of this course is to Understand the concepts related to Linux kernel
				CO 2	Understand the concepts related to Linux kernel Configuration and kernel modules	1							

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Chairman BOS-ECM

Dr. M. SUMAN
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Chairman BOS-ECM

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				CO 3	Understand various concepts related to User and Kernel Space communication, Interrupt Handling and Kernel Debugging.					1				
				CO 4	Analyze various types of device drivers that can be build into the kernel .		2			2				
				CO 5	Create Networking communication between client and server using SOCKET API		3				3			
15EM51A1	CPLD & FPGA Architectures and Applications	3-0-0	3	CO 1	Understand the architecture and features of ROM,PLA,PAL and CPLD		1					Modified	The objective of this course is to understand the architecture and features of CPLD & FPGA.	
				CO 2	Understand the architecture and features of FPGA.			1						
				CO 3	Understand XILINX FPGAs and Design various combinational & sequential logicrealization using XILINX FPGAS					1				
				CO 4	Analyze the technologies of Actel FPGAs			2			2			
				CO 5	Analyze different Design Applications		2			2				
15EM51B1	Embedded Real Time Operating Systems	3-0-0	3	CO 1	Understanding the concepts of Embedded Networking Communication Standard protocols: RS 232, RS 485, SPI, I2C bus protocols.		1						The objective of this course is to understand	
				CO 2	Analyze the US B& CAN based synchronization Techniques			2						
				CO 3	Applying Ethernet communication protocols for Embedded Systems					2				

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				CO 4	Apply different wireless sensor networks used in embedded systems.					2			
15EM52C1	Networking of Embedded Systems	3-0-0	3	CO 1	Understanding the concepts of Embedded Networking Communication Standard protocols: RS 232, RS 485, SPI, I2C bus protocols.	1					Modified	The objective of this course is to understand concepts of Embedded Networking Communication Standard protocols
				CO 2	Analyze the US B& CAN based synchronization Techniques	2							
				CO 3	Applying Ethernet communication protocols for Embedded Systems				2				
				CO 4	Apply different wireless sensor networks used in embedded systems.					2			
15EM52D3	Advanced Computer Networks	3-0-0	3	CO 1	Understand Congestion control and techniques to improve Quality of Service (QoS).	1					Modified	The objective of this course is to understand different types of network devices and usage of Wireless network.
				CO 2	Identify the different types of network devices and usage of Wireless network.	1							
				CO 3	Understand the skills of Cellular Systems and Virtual Private Networks.				1				
				CO 4	Familiarity with the ATM Protocol Reference Model and its Service categories.					1			

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Chairman BOS-ECM

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				CO 5	Describes the functionality associated with common network applications and Interconnection Networking Algorithms.	1				1				

Dr. SUMAN
Chairman BOS-ECM

Dr. M. SUMAN
PROFESSOR & HOD
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List of Pre-Ph.D Courses approved by

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Annexure-IV

A.Y.2015-16

S.NO	PAPER – 1	Code
1.	RESEARCH METHODOLOGY	15 RM ENGG 101

S.NO	PAPER – 2	Code	PAPER – 3	Code
1.	Information Retrieval System	15 CS 201	Big Data Analytics	15 CS 301
2.	Data Ware Housing And Mining	15 CS 202	Cloud Computing	15 CS 302
3.	Computer Networks	15 CS 203	Distributed Databases	15 CS 303
4.	Data Center Virtualization	15 CS 204	Pattern Recognition	15 CS 304
5.	Network Security	15 CS 205	Soft Computing	15 CS 305
6.	Software Architecture	15 CS 206	Software Engineering	15 CS 306
7.	Software Testing And Quality Assurance	15 CS 207	Software Reliability	15 CS 307
8.	Advances in Computing	15 CS 208	Web Security	15 CS 308
9.	Advanced Data Structures	15 CS 209	Wireless Sensor Networks	15 CS 309
10.	Digital Image Processing	15 CS 210	Software Project Management	15 CS 310
11.	Bio-Informatics	15 CS 211	Artificial Intelligence	15 CS 311
12.	Service Oriented Architecture	15 CS 212	Cloud Security	15 CS 312
13.	Mobile Cloud	15 CS 213	Data Security & Privacy	15 CS 313
14.	Distributed Computing	15 CS 214	Mobile Computing and Wireless Communication	15 CS 314
15.	Cryptography & Network Security	15 CS 215	Parallel Algorithms	15 CS 315

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S.NO	PAPER – 2	Code	PAPER – 3	Code
1.	Global Positioning Systems	15 EC 201	Bio Medical signal Processing	15 EC 301
2.	Advanced Digital Signal Processing	15 EC 202	Advanced Embedded Processor Architecture	15 EC 302
3.	Embedded Networking	15 EC 203	Wireless Cellular Communications	15 EC 303
4.	Modern Digital communication	15 EC 204	Speech Processing	15 EC 304
5.	Mathematics for signal processing	15 EC 205	Image and Video Processing	15 EC 305
6.	Wavelet theory and Applications	15 EC 206	EMI/EMC	15 EC 306
7.	Radiating systems	15 EC 207	MEMS Measurement Techniques	15 EC 307
8.	Micro Electro Mechanical Systems	15 EC 208	Antenna Measurements	15 EC 308
9.	RF & Microwave System Design	15 EC 209	VLSI System Design	15 EC 309
10.	Low Power VLSI Circuits	15 EC 210	MOS Circuit Design	15 EC 310
11.	Detection and Estimation Of Signals	15 EC 211	Testing of VLSI Circuits	15 EC 311
12.	Adaptive Signal Processing	15 EC 212	Advanced Analog IC Design	15 EC 312
13.	Real Time Concepts for Embedded Systems	15 EC 213	Microwave and Millimeter wave Circuits	15 EC 313
14.	Optical Signal Processing	15 EC 214	Multirate Signal Processing	15 EC 314
15.	ASIC Design Flow	15 EC 215	CMOS RF Circuit Design	15 EC 315

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DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING

MINUTES OF DEPARTMENT ACADEMIC COMMITTEE MEETING

On 25th May 2016 in its meeting DAC made the following recommendations to ECM-BOS to be made effective from the forth coming academic year 2016-17.

Agenda:

1. To discuss the feedbacks received from stake holders on curriculum
2. To propose the curriculum for B. Tech 2016-17 admitting batch
3. Any other points with the permission of the DAC chairman

The following Members were present

S.No.	Name of the Member	Designation	Signature
1.	Dr K.Raghava Rao	Chairman	
2.	Dr K Srinivasa Ravi	Member	
3.	Dr K Kiran Kumar	Member	
4.	Dr M Kameswara Rao	Member	
5.	Dr KVD Sagar	Member	

The following points were discussed and resolved:

1. The DAC discussed and resolved to recommend adding the Following Courses B. Tech (ECM) 2016-17 Batch Curriculum
    - Coding Skills
    - Fundamentals of Embedded System Design
    - Sensors and sensing principles
    - Fundamentals of Internet of Things
    - Wireless Technologies for IOT
    - IOT Application Programming Using Python
    - Cryptography and Network Security
    - Information Security and Risk Management
    - Mobile and Wireless Security
    - Computer Forensics
    - Security in Cloud Computing

2. Upon discussing the feedbacks from stake holders and surveying through the policy documents in relevance to APIIC, Human Resource Development Policy, Govt. of India, National Skill Development Corporation, Govt. of India, Confederation of Indian Industries, ABET, NBA norms and AICTE statutory norms , It is resolved to propose enclosed Program development documents and curriculum for B.Tech (Electronics and Computer Engineering) , M.Tech (Embedded Systems) and M.Tech (Wireless Communications & Sensor Networks) programs (Annexure-I) recommended to BOS
3. The DAC discussed and resolved to recommend modifying the Existing Syllabus of the Courses of B. Tech(ECM)2015-16 curriculum(annexure-1)
    - Upon discussing the feedback from students, it was resolved to offer the course C and Data Structures as two separate courses

      C & Data Structures-1 and C & Data Structures– 2
4. Upon discussing the feedback from students, it was resolved to remove Thermodynamics from 2016 Academic year onwards for ECM students.
5. The DAC discussed and resolved to recommend having a separate RPAC for ECM Department

DAC CHAIRMAN