

Annexure-1

COURSE VS SOS MAPPING

Course Code	Course Title	CO NO	Description of the Course Outcome	a	b	c	d	e	f	g	h	i	j	k	Course Type	Course Objective
13-EM-430	ADVANCED EMBEDDED PROCESSOR	CO 1	Understand 3 and 5 stage pipelines of ARM and able to program the ARM processor.	1											Retained Without Changes	The objective of the course is to provide strong foundation in ARM Processor Architecture and understand their use in SoC applications
		CO 2	Applying instructions set of ARM 7 processor using assembly language											2		
		CO 3	Understanding the AMBA bus architecture	1												
		CO 4	Analyze different advanced ARM cores and their use in SoC applications											2		
			Understand semiconduct											Modified	The objective of this course	

13 EC 206	CMOS VLSI Design	CO 1	or device fabrication process and Electrical Properties.			2								is Design and develop Digital CMOS circuits using
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											Microwind	
CO 2	Analyze the characteristics of CMOS circuits Construction and the comparison between different state-of-the-art CMOS technologies and processes									2		
CO 3	Design schematic diagrams , stick diagrams and layouts for digital circuits using CMOS and n-MOS logic										3	
CO 4	Analyze CMOS circuits in terms of area, speed and power dissipation by applying the techniques like transistor sizing & design rules.										2	
CO 5	Design and develop Digital CMOS circuits										3	

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		CO 5	Design and Simulation of System Design using Logisim Tool										2				
13-E M- E3 2	Embedd ed Network ing	CO 1	Understanding the concepts of Embedded Networking Communication Standard protocols: RS 232, RS 485, SPI, I2C bus protocols.											1	Added	The objective of this course is to Understanding the concepts of Embedded Networking Communication Standard protocols:	
		CO 2	Analyze the US B& CAN based synchronization Techniques											1			
		CO 3	Applying Ethernet communication protocols for Embedded Systems												1		
		CO 4	Apply different wireless sensor networks used in embedded systems.													2	
11 E M 401	EMBEDDED SYSTEMS	CO 1	Analyze embedded systems,												Modified	The objective of this course is to Analyze the basic interfacing and communication	

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																	on protocols used in embedded systems.	
		CO 2	Analyze and program on chip peripherals and off chip peripherals for a single purpose controller															
		CO 3	Analyze the basic interfacing and communication protocols used in embedded systems.															
		CO 4	Analyze and select appropriate software architecture and analyze the features real time operating systems.															
		CO 5	Develop and demonstrate a small embedded system for a real time application.															
13 E M 431	ENTER PRISE PROGR AMMIN G	CO 1	Create and Deploy web application														Added	The objective of this course is to Apply EJB technologies to Real Life applications

		CO 2	Understand and Apply JSF and JDBC											2	2			
		CO 3	Apply EJB technologies to Real Life applications											2	2			
		CO 4	Understand middleware technologies											1	1			
13 E M 433	SEMANTIC WEB	CO 1	Understand the basics of knowledge representation using ontologies & architecture of semantic web											1		Added	The objective of this course is to Understand the basics of semantic web architecture	
		CO 2	Understand the fundamentals of various ontology markup languages											1				
		CO 3	Understand the need for ontology management and tools.												2			
		CO 4	Understand the applications of semantic web specifically web services through a case study												1			
11 OE 432	DATA WARE HOUSING AND MINING	CO 1	Understand types of database, need for data mining and											1		Retained without Changes	The objective of this course is to Understand the need for	

	G		data warehouse Architecture.																data mining and data warehouse Architecture		
		CO 2	Understand the data Pre-processing techniques, and apply association rule mining on transactional data									1 2									
		CO 3	Apply classification & prediction techniques on various data sets											2							
		CO 4	Apply clustering techniques on large data sets											2							
13 AC 301	ADVANCED EMPLOYABILITY SKILLS	CO 1	Understand and adopt appropriate behavior patterns																Modified	The objective of this course is to Analyze and apply various interpersonal skills in day-to-day communication	
		CO 2	Understand ,remember and apply lexical, syntactic skills related to grammar, usage and composition																		
		CO 3	Analyze and apply																		

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			various interpersonal skills in day-to-day communication																
		CO 4	Understand, learn and apply the principles of various types of GDs and Personal Interviews																
	Design with PLDs and FPGAs	CO 1	Understand the basics of Full custom, Semicustom and PLD design methodologies	1												Modified	The objective of this course is to Understand the basics of PLD design methodologies		
		CO 2	Study and analysis of various combination al & sequential logic realizations using PLEs & PLDs	2															
		CO 3	Compare and analysis of architectures of different FPGAs	2															
		CO 4	Memorize and analysis of various sequential logic realizations using new generation	2															
13 EC 312																			

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			PLDs																
		CO 5	Create and Analysis of digital modules through project oriented approach												3				
11 EC 311	MICRO PROCESSOR & MICRO CONTROLLER	CO 1	Understand the working of Microcontroller 8051 and Instruction Set		1											Retained without changes	The objective of this course is to Understand the working of Microcontroller 8051		
		CO 2	Apply Interfacing concepts of few I/O Peripherals to 8051 through programming.		2														
		CO 3	Apply the Programming concepts of 8086		2														
		CO 4	Understand the working model of ARM Processor		1														
		CO 5	Applying the knowledge of 8051 and working through peripherals													3			
13 EM 332	PCB DESIGN.	CO 1	Understand the active and passive components,				1								Added	The objective of this course is to Understand			

			characteristics and the materials used along with their properties, mounting components on PCB, classification of PCB boards																the basics of PCB Fabrication
		CO 2	Understand different copper clad laminates and their properties, Soldering techniques.					1											
		CO 3	Apply the knowledge of schematic and layout to design a PCB					2											
		CO 4	Understand the basics of PCB Fabrication and generate foot print for library, etc					1											
11 E M3 30	Real Time Operating Systems	CO 1	Understand the basic principles of operating systems structures, design and implementation of processes and introduction to					1										Retained without changes	The objective of this course is to Understand the basic principles of Real time operating systems

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			distributed operating systems.															
		CO 2	Understand task state, process synchronization and analyze various synchronization and deadlock problems						1									
		CO 3	Apply different real time models, languages and scheduling.						2									
		CO 4	Apply RTOS in various application domains.										2					
13- CS - 301	SOFTWARE ENGINEERING	CO 1	Understand traditional and modern software process models used in the development of software systems.										1			Modified	The objective of this course is to Understand process models and stages involved in the development of software systems.	
		CO 2	Understand the traditional and modern trends in system modeling											1				
		CO 3	Design the architecture												3			

			and UI for an application using the principles and concepts of software design and golden rules of UI.																
		CO 4	Understand various software Quality concepts and testing strategies for development of quality software.															1	
		CO 5	Apply various types of UML Diagrams for given case study using rational rose.															3	
13 EM 333	VISUAL PROGRAMMING	CO 1	Understand the building blocks of .NET framework															Added	The objective of this course is to Understand the building blocks of .NET framework
		CO 2	Understand C# Language Fundamentals																
		CO 3	Apply Object Oriented Programming															2	

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			g Concepts through C#																	
		CO 4	Apply Interfaces, and collections through C# and understand .NET assemblies										2							
13 E M3 31	WEB PROGR AMMIN G	CO 1	Create static web pages using basic HTML and CSS.										3	Added	The objective of this course is to Create dynamic web pages using PHP and MYSQL					
		CO 2	Apply the fundamental components of the JavaScript programming language to an interactive web page.											2						
		CO 3	Understand the concepts of Document Object Model and Event handling mechanisms in JavaScript.												1					
		CO 4	Create dynamic web pages using PHP and MYSQL.												3					

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11 OE 432	DATA WARE HOUSI NG AND MININ G	CO 1	Understand types of database, need for data mining and data warehouse Architecture.																1	Retaine d without Change s	The objective of this course is to Understand the need for data mining and data warehouse Architecture	
		CO 2	Understand the data Pre-processing techniques, and apply association rule mining on transactional data																	1 , 2		
		CO 3	Apply classification & prediction techniques on various data sets																	2		
		CO 4	Apply clustering techniques on large data sets																	2		
13 EC 205	Analog Electron ic Circuits	CO 1	Design different types of feed-back amplifiers and provide general solution for real time problems																3	Modifie d	The objective of this course is to Understand the basics of various amplifiers and provide general solution for real time problems using them	
		CO 2	Design different types of																3			

			Oscillators and provide general solution for real time problems, and Design active filters using OPAMPs															
		CO 3	Design other non-linear applications of OPAMPs such as precision rectifier, zero crossing detector, etc..., Design the applications of 555timer															
		CO 4	Analyze different types of Power amplifiers															
13 EC 203	Basics of Digital Systems	CO 1	Understand the representation of data using different codes and the principles of Boolean algebra to manipulate and minimize logic expressions														Modified	The objective of this course is to Understand different combinationa l and sequential circuits and work with NI MyDaq & Labview

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		Examine the functioning of different combination al logic circuits built with logic gates and the design procedure for developing circuits like adders, decoders, code converters, etc.				2											
		Analyze the behavior of flip-flops and the operation of sequential circuits using flip-flops				2											
		Implement the design approach for creating sequential circuits like counters, shift registers, etc., and the concept of ASM charts in describing the digital systems				2											
		Implement different combination al and									3						

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			sequential circuits with NI MyDaq and Labview																		
13 CS 205	Comput er Network s	CO 1	Understand OSI and TCP/IP Models and basics of physical layer and their issues	1															Modified	The objective of this course is to understand the basic concepts of network protocols, routing algorithms and their design in client server communication	
		CO 2	Demonstrate Data Link layer issues and medium access control sub layers concepts					2													
		CO 3	Analyze and implement the algorithms of network, transport layers and concerned services	2					2												
		CO 4	Implement the concepts of TCP,UDP and the application layer conceptions																		

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		CO 5	Demonstrate the basic concepts of protocols and their design including client/server models, connection oriented and connection-less models	3																
13 CS 204	Data Base Management System	CO 1	Understand advantages of DBMS and its characteristics, concepts & ER model.	1														Modified	The objective of this course is to Understand the characteristics and concepts of DBMS	
		CO 2	Demonstrate Relational Database using SQL detailing the role of Relational Algebra and Relational Calculus.		2															
		CO 3	Examine storing data, File organizations, Indexing and Illustrates Normal Forms.		2															
		CO 4	Interpret Transaction Management and Concurrency		2															

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			control techniques.															
		CO 5	Create database for a given case study.	2														
13 ES 204	DATA STRUC TURES	CO 1	Student will be able to apply measures of efficiency to algorithms and Compare various linear data structures like Stack ADT, Queue ADT, Linked lists.	2		2											Modified	The objective of this course is to analyze and compare various data structures
		CO 2	Student will be able to analyze and compare linear data structures and analyze different searching and hashing techniques.	2		2												
		CO 3	Student will be able to analyze and compare various non-linear data structures like Trees and Graphs.	2		2												
		CO 4	Student will be able to analyze and compare various sorting	2		2												

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			g algorithms, to select from a range of possible options, to provide justification for that selection, and to implement the algorithm in a particular context.															
		CO 5	Student will be able to understand and execute lab experiments and develop a project along with his/her team members.															
13- BS 206	Discrete Mathematics	CO 1	Apply various Set Operations and Logical Inferences for solving problems and the principle of Mathematical Induction.														Added	The objective of this course is to apply the basic methods of discrete mathematics in Computer Science
		CO 2	Analyze Combinatorial and Permutation Analysis, Binomial theorem, Multinomial theorem and															

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			Principle of Inclusion and Exclusion.															
		CO 3	Analyzedifferent types of Graphs,Lattices, Sorting and Searchingtechniques and Applications of Graphs	2														
		CO 4	Applyprocedure for solving Spanning Trees and different methods for solving Recurrence Relations.				2											
13 AC 201	Energy and Society	CO 1	Understand the various forms of available energy and energy related aspects.						1		1			Modified	The objective of this course is to Understand the various forms of available energy and energy related aspects.			
		CO 2	Apply energy auditing methodology to estimate energy conservation of different case studies.						2		2							
		CO 3	Understand the environmental and geological						1		1							

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			impacts on the energy vice versa.																	
		CO 4	Apply the planning and controlling aspects for economical energy usage.										2	2						
13 ES 203	Network Theory	CO 1	Understand the VI characteristics of electrical elements, solution of complex problems of DC circuits using transformations, nodal, mesh analysis and theorems.	1														Added	The objective of this course is to apply the basic tools of circuit analysis.	
		CO 2	Understand the fundamentals and interconnection relations of 3 – phase circuits.	1																
		CO 3	Analyze the series and parallel resonance and magnetic circuits.	2																
		CO 4	Analyze the transient analysis of DC / AC circuits, two	2																

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			port networks and solve complex networks using topology.															
		CO 5	Develop a circuit model for a given practical case, apply the basic tools of circuit analysis for getting desired response and refine the circuit model if necessary on obtained response.	3	3									3				
13 E M2 02	Commu nication Systems	CO 1	Understand the basics of Modulation and demodulation techniques, Different types of filtering techniques and Radio Receiver characteristics											1	Added			The objective of this course is to Understand the basics of Communication mechanisms
		CO 2	Understand the sampling techniques and signal to		2									2				

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			noise ratio of different pulse modulation schemes															
		CO 3	Design and understand the Digital Modulation schemes, bandwidth estimation and clock recovery					2						2				
		CO 4	Understanding the source coding techniques and estimate the error detection and correction of different block codes.											2				
11 E M3 01	Internet Programming	CO 1	Students demonstrate an understanding of basic HTML tags related to text, hyperlinks, Images and ordered/unordered lists.												Added		The objective of this course is to Create dynamic web pages using Servlets /JSP	
		CO 2	Students will be able to Apply inline, internal, external CSS to define look and feel													2		

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			(style) of single/multiple web pages.															
		CO 3	Students will be able to Apply basic Object Oriented programming concepts like Encapsulation, Inheritance and polymorphism to solve various computing problems.	2														
		CO 4	Students demonstrate an understanding of Servlets/JSP concepts to process data from HTML forms.															
13 EC 201	Design of Electronic Systems	CO 1	Design Basic Electronics Systems and circuits	1													Modified	The objective of this course is to Design Basic Electronics Systems and circuits
		CO 2	Design Basic amplifiers	1	2													
		CO 3	Design linear amplifiers using op-amps	1	2													

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		CO 4	Design basic applications of diode, BJT and JFET	2	1															
13 ES 205	Signal Processi ng	CO 1	Understand the representation, manipulation and processing operations of DT signals and systems	1	1		1											Modified	The objective of this course is to Understand the processing operations of DT signals and systems	
		CO 2	Interpret the analysis of DT systems using Z.T.				2	2							2					
		CO 3	Apply the Fourier Transformati on techniques for DT sequences and their applications		2		2	2												
		CO 4	Ability to design, Implementat ion and realization of digital filters.				2	2							2					
13 ES 202	Object Oriente d Progra mming	CO 1	The student will be able to understand basic Concepts of OOP, fundamentals of java and apply the concepts of classes and objects through Java Language.															Modified	The objective of this course is to understand basic Concepts of OOP, fundamentals of java	

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		CO 2	The student will be able to apply constructors, Overloading, parameter passing, access control in Java programming.	2																	
		CO 3	The student will be able to apply Inheritance, Packages, Interfaces.	2																	
		CO 4	The student will be able to apply Exception Handling, I/O Streams and understand Basic Concepts of MultiThreading	2																	
		CO 5	Students will be able to develop programs and projects in java.	2																	
11E M3 34	Micro control lers Interfaci ng & System Design	CO 1	Understand and remember the fundamentals of the microcontrollers like architecture, memory organization.															Retaine d without Change s	The objective of this course is to Understand the fundamentals of the microcontrollers and their architectures		
		CO 2	Apply the instructions in writing basic assembly language programming.																		
		CO 3	Apply the concepts of interrupts, timers in applications where required.																		
		CO 4	Analyze the differences in architectures of																2		

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		8051 and PIC µc's and Analyze I/O Different and devices and their interfacing to 8051 µc																	
13 HS 101	ENGLISH	CO 1	Kinesics: To enable the students with the study of body language as it is an essential component of soft skills.	1													Modified	The objective of this course is to To enable the students to understand English usage and grammar	
		CO 2	Lexis: Vocabulary building	1															
		CO 3	English usage and mechanics: Grammar and verbal reasoning					2											
		CO 4	Office communication to improve learning skills					2											
13 HS 102	LANGUAGE AND REASONING SKILLS	CO 1	Understand the method of identifying the meaning of words and apply them in contexts.							2							Modified	The objective of this course is to Understand and analyze techniques of reading and formal communication	
		CO 2	Understand and analyze different cultures and the importance of empathy in cross-cultural communication.						2										
		CO 3	Understand and analyze seven techniques of reading and improve reading speed.								2								
		CO 4	Understand and apply writing strategies in office/ formal communication									2							
11 BS 105	ECOLOGY AND ENVIRONMENT	CO 1	Understand the importance of Environmental education and conservation of natural resources														Retained without changes	The objective of this course is to Understand the importance of Environmental education and conservation of natural resources	
		CO 2	Understand the importance of ecosystems and																

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			biodiversity.																						
		CO 3	Understand the knowledge on solid waste management																						
		CO 4	Understand the knowledge on disaster management and EIA process																						
13 HS VALUE	HUMAN VALUES	CO 1	realize and understand the basic aspiration, harmony in the human being.																		Added	The objective of this course is to understand the basic aspiration, harmony in the human being.			
		CO 2	envisage the roadmap to fulfill the basic aspiration of human beings.	2																					
		CO 3	Analyze the profession and his role in this existence.																						
		CO 4	Develops holistic perception by understanding harmony in nature																						
13 BS 101	LINEAR ALGEBRA AND MULTIVARIABLE CALCULUS	CO 1	Perform elementary operations on matrices including determination of rank and inverse, demonstrate mastery in using matrix algebra to find the solution to a linear system equations, iterative methods: Jacobi's method and Gauss - Seidal method .Determine the eigen values and eigen vectors, Cayley-Hamilton theorem and its applications, nature of the quadratic forms	2	2																	Modified	The objective of this course is to understand the basic operations of linear algebra and calculus		
		CO 2	Interpret and apply differential calculus on problems involving rate of change. Explain the geometrical interpretation and applications of Rolle's theorem and mean value theorems. Analyze the maximization and minimization problems.	2	1																				

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		CO 3	Illustrate the applications of integral calculus in solving problems on area, volume, displacement, work, etc. Computing improper integrals, Beta, Gamma functions and their properties. Compute multiple integrals by changing the order of integration and change of variables such as polar, spherical and cylindrical coordinates.	2	2														
		CO 4	Determine gradient, divergence and curl of vector point functions with their properties. Calculate the line, surface and volume integrals, Green's, Gauss divergence and Stoke's theorems and their applications.	2	2														
13	DIFFERENTIAL EQUATIONS	CO 1	Describe different situations required to model differential equations. Classify the differential equations and identify suitable solution techniques	2	2												Modified	The objective of this course is to understand the basic operations of Differential Equations	
102		CO 2	Illustrate modeling an engineering problem as a first order ordinary differential equation (ODE) and solving it using numerical methods available viz. Taylor, Euler, modified Euler and Runge-Kutta method	2	1														
		CO 3	Analyze engineering problem solutions in particular electric circuits, deflection of beams, free oscillations, forced oscillations and resonance through differential equations	2	2														

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		CO 3	Illustrate to model an engineering problem second order PDEs namely one dimensional wave and heat equations, two dimensional Laplace equation into PDEs and find their general solutions using C.F and P.I.	2	2															
13 BS 103	ENGINE ERING PHYSICS	CO 1	Explain how ultrasonic waves are produced and detected,	1														Modified	The objective of this course is to Understand the fundamental concepts of engineering physics	
			Determine flaws present inside a material using NDT techniques.																	
		CO 2	Compute the magnetic induction produced by current carrying conductors by using Biot-Savart law & Ampere's law, Compute the Lorentz force experienced by a charged particle.	1																
		CO 3	Understand different aberrations in lenses and their corrections, phenomenon of interference in thin films of uniform thickness	1																
		CO 4	Explain the working of optoelectronic devices like LED, photodiode, photo transistor and solar cells, Explain the phenomenon of superconductivity and its applications	1																
11 BS 104	ENGINE ERING CHEMISTRY	CO 1	Examine water quality and select appropriate purification technique for intended problem		2	2												Modified	The objective of this course is to Understand the	

103	MATERIALS	kinds of crystal imperfections and appreciates structure-property relationship in crystals.																	is to Understand the fundamental concepts of engineering materials and their characteristics	
		CO 2 Understands the role of electronic energy band structures of solids in governing various electrical and optical properties of materials.	1																	
		CO 3 Understands role of molecular vibrations in determining thermal properties of materials and deformation of materials in response to action of load, for identification of materials having specific engineering applications.	1																	
		CO 4 Understands spin and orbital motion of electrons in determining magnetic properties of materials and identifies their role in classification soft & hard magnetic materials having specific engineering applications.	1																	
13 ES 102	MEASUREMENTS	CO 1 Understand and apply the fundamentals of a measurement system, characteristics, transducers and metrology using simulation and experimentation tools.	2	2														Modified	The objective of this course is to Understand and apply the fundamentals of a measurement system using simulation and experimentation tools	
		CO 2 Understand various electrical & computer parameters, and apply different measuring	2	2																

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			techniques on various electrical parameters using simulation and experimentation tools.																	
		CO 3	Understand electronic & electro-physiological parameters, and apply measuring techniques on electronic parameters using simulation and experimentation tools.	2	2															
		CO 4	Understand and apply different measuring techniques on civil and mechanical parameters using simulation and experimentation tools.	2	2															
11 ES 104	ENGINE ERING GRAPHI CS WITH CAD	CO 1	Draft Orthographic views, projections of planes and solids manually and by using CAD software Tool (AutoCAD)						2							Retained without changes		The objective of this course is to Use the CAD software Tool (AutoCAD) for Drafting various views		
		CO 2	Drafting Sectional views, Isometric views manually and by using AutoCAD						2											
		CO 3	Development of surfaces and perspectives views manually and by using AutoCAD						2											
13 ES 105	WORKS HOP PRACTI CE	CO 1	Project based workshop to prepare different models with the aid of workshop trades i.e., Carpentry and Tin smithy												2	Modified		The objective of this course is to prepare different models with the aid of workshop trades		
		CO 2	Project based workshop to prepare different models with the aid of workshop trades i.e., House wiring and Fitting												2					
		CO 3	Project based workshop to prepare different models with the aid of workshop trades i.e., Fitting												2					
13	PROBL	CO	Illustrate how problems are	2					2							Modified		The objective		

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ES 101	EM SOLVIN G THROU GH PROGR AMMIN G	1	solved using computers and programming.																of this course is to Apply C programming concepts to solve real world problems	
		CO 2	Interpret & Illustrate user defined C functions and different operations on list of data.	2			2													
		CO 3	Implement Linear Data Structures and compare them.		2															
		CO 4	Implement Binary Trees.		2															
13 ES 106	ENGINE ERING MECHA NICS	CO 1	Understand the concept of forces and apply the static equilibrium equations.	1			2											Modified	The objective of this course is to Understand the basic concepts of engineering mechanics	
		CO 2	Analyze co-planar and non co-planar system of forces.	2			2													
		CO 3	Apply the concept of centroid & centre of gravity to determine moment of inertia.	2			2													
		CO 4	Analyze the rigid bodies under translation and rotation with and without considering forces.	2			2													
13 ES 201	THERM ODYNA MICS	CO 1	Apply first law of thermodynamics to non flow systems	2			2											Added	The objective of this course is to Understand the fundamental concepts of thermodynamics	
		CO 2	Apply steady flow energy equation and second law of thermodynamics to various processes and engineering	2			2													

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			devices																
			CO 3 apply principle of entropy and thermodynamic relations to thermodynamic system and process	2															
			CO 4 Evaluate the performance of Otto, Diesel, Dual cycles and Refrigeration cycles	2															
13 BS 103	ENGINE ERING PHYSICS	CO 1	Explain how ultrasonic waves are produced and detected, Determine flaws present inside a material using NDT techniques.	1													Modified	The objective of this course is to Understand the fundamental concepts of engineering physics	
		CO2	Compute the magnetic induction produced by current carrying conductors by using Biot-Savart law & Ampere's law, Compute the Lorentz force experienced by a charged particle.	1															
		CO3	Understand different aberrations in lenses and their corrections, phenomenon of interference in thin films of uniform thickness	1															
		CO4	Explain the working of optoelectronic devices like LED, photodiode, photo transistor and solar cells, Explain the phenomenon of superconductivity and its applications	1															

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		CO 3	Understanding the AMBA bus architecture	1												
		CO 4	Analyze different advanced ARM cores and their use in SoC applications												2	
			Understand semiconduct												Modified	The objective of this course

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											Microwind	
CO 2	Analyze the characteristics of CMOS circuits Construction and the comparison between different state-of-the-art CMOS technologies and processes									2		
CO 3	Design schematic diagrams , stick diagrams and layouts for digital circuits using CMOS and n-MOS logic										3	
CO 4	Analyze CMOS circuits in terms of area, speed and power dissipation by applying the techniques like transistor sizing & design rules.										2	
CO 5	Design and develop Digital CMOS circuits										3	

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			using Microwind																					
13 E M2 01	Comput er Organiz ation	CO 1	Understand the logical gates to construct combinational & sequential circuits to perform different μ -operations and design of basic computer				1														Modified	The objective of this course is to Design and Simulate System Design using Logisim		
		CO 2	Develop micro Programs for design of Control Unit, CPU				1																	
		CO 3	Apply and realize operations like Multiplication, Floating Point algorithms using supporting modern engineering tools.																					2
		CO 4	Understand Memory Hierarchy, mapping procedures and the Peripherals, I/O interface and Direct Memory Access.																					

	G		data warehouse Architecture.															data mining and data warehouse Architecture
		CO 2	Understand the data Pre-processing techniques, and apply association rule mining on transactional data															
		CO 3	Apply classification & prediction techniques on various data sets															
		CO 4	Apply clustering techniques on large data sets															
13 AC 301	ADVANCED EMPLOYABILITY SKILLS	CO 1	Understand and adopt appropriate behavior patterns															Modified The objective of this course is to Analyze and apply various interpersonal skills in day-to-day communication
		CO 2	Understand ,remember and apply lexical, syntactic skills related to grammar, usage and composition															
		CO 3	Analyze and apply															

			various interpersonal skills in day-to-day communication																
		CO 4	Understand, learn and apply the principles of various types of GDs and Personal Interviews																
13 EC 312	Design with PLDs and FPGAs	CO 1	Understand the basics of Full custom, Semicustom and PLD design methodologies	1											Modified	The objective of this course is to Understand the basics of PLD design methodologies			
		CO 2	Study and analysis of various combination al & sequential logic realizations using PLEs & PLDs	2															
		CO 3	Compare and analysis of architectures of different FPGAs	2															
		CO 4	Memorize and analysis of various sequential logic realizations using new generation	2															

			PLDs																	
		CO 5	Create and Analysis of digital modules through project oriented approach														3			
11 EC 311	MICRO PROCE SSOR & MICRO CONTR OLLER	CO 1	Understand the working of Microcontroller 8051 and Instruction Set		1													Retained without changes	The objective of this course is to Understand the working of Microcontroller 8051	
		CO 2	Apply Interfacing concepts of few I/O Peripherals to 8051 through programming.		2															
		CO 3	Apply the Programming concepts of 8086		2															
		CO 4	Understand the working model of ARM Processor		1															
		CO 5	Applying the knowledge of 8051 and working through peripherals															3		
13 EM 332	PCB DESIG N.	CO 1	Understand the active and passive components,															Added	The objective of this course is to Understand	

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			characteristics and the materials used along with their properties, mounting components on PCB, classification of PCB boards															the basics of PCB Fabrication
		CO 2	Understand different copper clad laminates and their properties, Soldering techniques.				1											
		CO 3	Apply the knowledge of schematic and layout to design a PCB				2											
		CO 4	Understand the basics of PCB Fabrication and generate foot print for library, etc				1											
11 E M3 30	Real Time Operating Systems	CO 1	Understand the basic principles of operating systems structures, design and implementation of processes and introduction to				1										Retained without changes	The objective of this course is to Understand the basic principles of Real time operating systems

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			and UI for an application using the principles and concepts of software design and golden rules of UI.																
		CO 4	Understand various software Quality concepts and testing strategies for development of quality software.															1	
		CO 5	Apply various types of UML Diagrams for given case study using rational rose.															3	
13 EM 333	VISUAL PROGRAMMING	CO 1	Understand the building blocks of .NET framework															Added	The objective of this course is to Understand the building blocks of .NET framework
		CO 2	Understand C# Language Fundamentals																
		CO 3	Apply Object Oriented Programming															2	

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			g Concepts through C#																				
		CO 4	Apply Interfaces, and collections through C# and understand .NET assemblies																				
13 E M3 31	WEB PROGR AMMIN G	CO 1	Create static web pages using basic HTML and CSS.																	Added	The objective of this course is to Create dynamic web pages using PHP and MYSQL		
		CO 2	Apply the fundamental components of the JavaScript programming language to an interactive web page.																				
		CO 3	Understand the concepts of Document Object Model and Event handling mechanisms in JavaScript.																				
		CO 4	Create dynamic web pages using PHP and MYSQL.																				

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11 OE 432	DATA WARE HOUSI NG AND MININ G	CO 1	Understand types of database, need for data mining and data warehouse Architecture.																1	Retained without Changes	The objective of this course is to Understand the need for data mining and data warehouse Architecture	
		CO 2	Understand the data Pre-processing techniques, and apply association rule mining on transactional data																	1 2		
		CO 3	Apply classification & prediction techniques on various data sets																	2		
		CO 4	Apply clustering techniques on large data sets																	2		
13 EC 205	Analog Electron ic Circuits	CO 1	Design different types of feed-back amplifiers and provide general solution for real time problems																		Modified	The objective of this course is to Understand the basics of various amplifiers and provide general solution for real time problems using them
		CO 2	Design different types of																	3		

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			Oscillators and provide general solution for real time problems, and Design active filters using OPAMPs															
		CO 3	Design other non-linear applications of OPAMPs such as precision rectifier, zero crossing detector, etc..., Design the applications of 555timer															
		CO 4	Analyze different types of Power amplifiers															
13 EC 203	Basics of Digital Systems	CO 1	Understand the representation of data using different codes and the principles of Boolean algebra to manipulate and minimize logic expressions														Modified	The objective of this course is to Understand different combinationa l and sequential circuits and work with NI MyDaq & Labview

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CO 2	Examine the functioning of different combination al logic circuits built with logic gates and the design procedure for developing circuits like adders, decoders, code converters, etc.				2														
CO 3	Analyze the behavior of flip-flops and the operation of sequential circuits using flip-flops				2														
CO 4	Implement the design approach for creating sequential circuits like counters, shift registers, etc., and the concept of ASM charts in describing the digital systems				2														
CO 5	Implement different combination al and											3							

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			sequential circuits with NI MyDaq and Labview																		
13 CS 205	Comput er Network s	CO 1	Understand OSI and TCP/IP Models and basics of physical layer and their issues	1															Modified	The objective of this course is to understand the basic concepts of network protocols, routing algorithms and their design in client server communication	
		CO 2	Demonstrate Data Link layer issues and medium access control sub layers concepts					2													
		CO 3	Analyze and implement the algorithms of network, transport layers and concerned services	2				2													
		CO 4	Implement the concepts of TCP,UDP and the application layer conceptions					2													

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		CO 5	Demonstrate the basic concepts of protocols and their design including client/server models, connection oriented and connection-less models	3		3														
13 CS 204	Data Base Management System	CO 1	Understand advantages of DBMS and its characteristics, concepts & ER model.	1														Modified	The objective of this course is to Understand the characteristics and concepts of DBMS	
		CO 2	Demonstrate Relational Database using SQL detailing the role of Relational Algebra and Relational Calculus.		2															
		CO 3	Examine storing data, File organization, Indexing and Illustrates Normal Forms.		2															
		CO 4	Interpret Transaction Management and Concurrency		2															

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			control techniques.																
		CO 5	Create database for a given case study.	2															
13 ES 204	DATA STRUC TURES	CO 1	Student will be able to apply measures of efficiency to algorithms and Compare various linear data structures like Stack ADT, Queue ADT, Linked lists.	2		2												Modified	The objective of this course is to analyze and compare various data structures
		CO 2	Student will be able to analyze and compare linear data structures and analyze different searching and hashing techniques.	2		2													
		CO 3	Student will be able to analyze and compare various non-linear data structures like Trees and Graphs.	2		2													
		CO 4	Student will be able to analyze and compare various sorting	2		2													

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			g algorithms, to select from a range of possible options, to provide justification for that selection, and to implement the algorithm in a particular context.															
		CO 5	Student will be able to understand and execute lab experiments and develop a project along with his/her team members.															
13-BS 206	Discrete Mathematics	CO 1	Apply various Set Operations and Logical Inferences for solving problems and the principle of Mathematical Induction.														Added	The objective of this course is to apply the basic methods of discrete mathematics in Computer Science
		CO 2	Analyze Combinatorial and Permute Analysis, Binomial theorem, Multinomial theorem and															

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			Principle of Inclusion and Exclusion.															
		CO 3	Analyzed different types of Graphs, Lattices, Sorting and Searching techniques and Applications of Graphs	2														
		CO 4	Apply procedure for solving Spanning Trees and different methods for solving Recurrence Relations.				2											
13 AC 201	Energy and Society	CO 1	Understand the various forms of available energy and energy related aspects.						1		1			Modified	The objective of this course is to Understand the various forms of available energy and energy related aspects.			
		CO 2	Apply energy auditing methodology to estimate energy conservation of different case studies.						2		2							
		CO 3	Understand the environmental and geological						1		1							

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			impacts on the energy vice versa.																
		CO 4	Apply the planning and controlling aspects for economical energy usage.								2	2							
13 ES 203	Network Theory	CO 1	Understand the VI characteristics of electrical elements, solution of complex problems of DC circuits using transformations, nodal, mesh analysis and theorems.	1													Added	The objective of this course is to apply the basic tools of circuit analysis.	
		CO 2	Understand the fundamentals and interconnection relations of 3 – phase circuits.	1															
		CO 3	Analyze the series and parallel resonance and magnetic circuits.	2															
		CO 4	Analyze the transient analysis of DC / AC circuits, two	2															

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			port networks and solve complex networks using topology.															
		CO 5	Develop a circuit model for a given practical case, apply the basic tools of circuit analysis for getting desired response and refine the circuit model if necessary based on obtained response.	3	3									3				
13 E M2 02	Commu nication Systems	CO 1	Understand the basics of Modulation and demodulation techniques, Different types of filtering techniques and Radio Receiver characteristics											1	Added			The objective of this course is to Understand the basics of Communication mechanisms
		CO 2	Understand the sampling techniques and signal to		2									2				

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			noise ratio of different pulse modulation schemes																
		CO 3	Design and understand the Digital Modulation schemes, bandwidth estimation and clock recovery												2				
		CO 4	Understanding the source coding techniques and estimate the error detection and correction of different block codes.																
11 E M3 01	Internet Programming	CO 1	Students demonstrate an understanding of basic HTML tags related to text, hyperlinks, Images and ordered/unordered lists.															Added	The objective of this course is to Create dynamic web pages using Servlets /JSP
		CO 2	Students will be able to Apply inline, internal, external CSS to define look and feel																

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			(style) of single/multiple web pages.															
		CO 3	Students will be able to Apply basic Object Oriented programming concepts like Encapsulation, Inheritance and polymorphism to solve various computing problems.	2				2										
		CO 4	Students demonstrate an understanding of Servlets/JSP concepts to process data from HTML forms.					3					3					
13 EC 201	Design of Electronic Systems	CO 1	Design Basic Electronics Systems and circuits	1									2	Modified	The objective of this course is to Design Basic Electronics Systems and circuits			
		CO 2	Design Basic amplifiers	1	2			2										
		CO 3	Design linear amplifiers using op-amps	1	2			2										

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		CO 4	Design basic applications of diode, BJT and JFET	2	1																	
13 ES 205	Signal Processi ng	CO 1	Understand the representation, manipulation and processing operations of DT signals and systems	1	1			1											Modified	The objective of this course is to Understand the processing operations of DT signals and systems		
		CO 2	Interpret the analysis of DT systems using Z.T.					2	2										2			
		CO 3	Apply the Fourier Transformation techniques for DT sequences and their applications			2		2	2													
		CO 4	Ability to design, Implementation and realization of digital filters.					2	2											2		
13 ES 202	Object Oriente d Progra mming	CO 1	The student will be able to understand basic Concepts of OOP, fundamentals of java and apply the concepts of classes and objects through Java Language.																Modified	The objective of this course is to understand basic Concepts of OOP, fundamentals of java		

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		CO 2	The student will be able to apply constructors, Overloading, parameter passing, access control in Java programming.	2																
		CO 3	The student will be able to apply Inheritance, Packages, Interfaces.	2																
		CO 4	The student will be able to apply Exception Handling, I/O Streams and understand Basic Concepts of MultiThreading	2																
		CO 5	Students will be able to develop programs and projects in java.	2																
11E M3 34	Micro control lers Interfaci ng & System Design	CO 1	Understand and remember the fundamentals of the microcontrollers like architecture, memory organization.															Retaine d without Change s	The objective of this course is to Understand the fundamentals of the microcontrollers and their architectures	
		CO 2	Apply the instructions in writing basic assembly language programming.																	
		CO 3	Apply the concepts of interrupts, timers in applications where required.																	
		CO 4	Analyze the differences in architectures of															2		

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		8051 and PIC μc's and Analyze I/O Different and devices and their interfacing to 8051 μc																	
13 HS 101	ENGLISH	CO 1	Kinesics: To enable the students with the study of body language as it is an essential component of soft skills.	1													Modified	The objective of this course is to To enable the students to understand English usage and grammar	
		CO 2	Lexis: Vocabulary building	1															
		CO 3	English usage and mechanics: Grammar and verbal reasoning					2											
		CO 4	Office communication to improve learning skills					2											
13 HS 102	LANGUAGE AND REASONING SKILLS	CO 1	Understand the method of identifying the meaning of words and apply them in contexts.							2							Modified	The objective of this course is to Understand and analyze techniques of reading and formal communication	
		CO 2	Understand and analyze different cultures and the importance of empathy in cross-cultural communication.					2											
		CO 3	Understand and analyze seven techniques of reading and improve reading speed.							2									
		CO 4	Understand and apply writing strategies in office/ formal communication							2									
11 BS 105	ECOLOGY AND ENVIRONMENT	CO 1	Understand the importance of Environmental education and conservation of natural resources														Retained without changes	The objective of this course is to Understand the importance of Environmental education and conservation of natural resources	
		CO 2	Understand the importance of ecosystems and																

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			biodiversity.																			
		CO 3	Understand the knowledge on solid waste management																1			
		CO 4	Understand the knowledge on disaster management and EIA process																1			
13 HS VALUE	HUMA 104 S	CO 1	realize and understand the basic aspiration, harmony in the human being.																1	Added	The objective of this course is to understand the basic aspiration, harmony in the human being.	
		CO 2	envisage the roadmap to fulfill the basic aspiration of human beings.	2															2			
		CO 3	Analyze the profession and his role in this existence.																2			
		CO 4	Develops holistic perception by understanding harmony in nature																2			
13 BS 101	LINEAR ALGEB RA AND MULTI VARIA TE CALCU LUS	CO 1	Perform elementary operations on matrices including determination of rank and inverse, demonstrate mastery in using matrix algebra to find the solution to a linear system equations, iterative methods: Jacobi's method and Gauss - Seidal method .Determine the eigen values and eigen vectors, Cayley-Hamilton theorem and its applications, nature of the quadratic forms	2	2														2	Modified	The objective of this course is to understand the basic operations of linear algebra and calculus	
		CO 2	Interpret and apply differential calculus on problems involving rate of change. Explain the geometrical interpretation and applications of Rolle's theorem and mean value theorems. Analyze the maximization and minimization problems.	2	1														2			

		CO 3	Illustrate the applications of integral calculus in solving problems on area, volume, displacement, work, etc. Computing improper integrals, Beta, Gamma functions and their properties. Compute multiple integrals by changing the order of integration and change of variables such as polar, spherical and cylindrical coordinates.	2	2														
		CO 4	Determine gradient, divergence and curl of vector point functions with their properties. Calculate the line, surface and volume integrals, Green's, Gauss divergence and Stoke's theorems and their applications.	2	2														
13	DIFFERENTIAL EQUATIONS	CO 1	Describe different situations required to model differential equations. Classify the differential equations and identify suitable solution techniques	2	2										Modified	The objective of this course is to understand the basic operations of Differential Equations			
102		CO 2	Illustrate modeling an engineering problem as a first order ordinary differential equation (ODE) and solving it using numerical methods available viz. Taylor, Euler, modified Euler and Runge-Kutta method	2	1														
		CO 3	Analyze engineering problem solutions in particular electric circuits, deflection of beams, free oscillations, forced oscillations and resonance through differential equations	2	2														

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		CO 3	Illustrate to model an engineering problem second order PDEs namely one dimensional wave and heat equations, two dimensional Laplace equation into PDEs and find their general solutions using C.F and P.I.	2	2															
13 BS 103	ENGINE ERING PHYSICS	CO 1	Explain how ultrasonic waves are produced and detected,	1														Modified	The objective of this course is to Understand the fundamental concepts of engineering physics	
			Determine flaws present inside a material using NDT techniques.																	
		CO 2	Compute the magnetic induction produced by current carrying conductors by using Biot-Savart law & Ampere's law, Compute the Lorentz force experienced by a charged particle.	1																
		CO 3	Understand different aberrations in lenses and their corrections, phenomenon of interference in thin films of uniform thickness	1																
		CO 4	Explain the working of optoelectronic devices like LED, photodiode, photo transistor and solar cells, Explain the phenomenon of superconductivity and its applications	1																
11 BS 104	ENGINE ERING CHEMISTRY	CO 1	Examine water quality and select appropriate purification technique for intended problem		2	2												Modified	The objective of this course is to Understand the	

103	MATERIALS	kinds of crystal imperfections and appreciates structure-property relationship in crystals.																															is to Understand the fundamental concepts of engineering materials and their characteristics
	CO 2	Understands the role of electronic energy band structures of solids in governing various electrical and optical properties of materials.	1																														
	CO 3	Understands role of molecular vibrations in determining thermal properties of materials and deformation of materials in response to action of load, for identification of materials having specific engineering applications.	1																														
	CO 4	Understands spin and orbital motion of electrons in determining magnetic properties of materials and identifies their role in classification soft & hard magnetic materials having specific engineering applications.	1																														
13 ES 102	MEASUREMENTS	Understand and apply the fundamentals of a measurement system, characteristics, transducers and metrology using simulation and experimentation tools.	2	2														Modified															The objective of this course is to Understand and apply the fundamentals of a measurement system using simulation and experimentation tools
	CO 2	Understand various electrical & computer parameters, and apply different measuring	2	2																													

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ES 101	EM SOLVING THROUGH PROGRAMMING	1	solved using computers and programming.																	of this course is to Apply C programming concepts to solve real world problems		
		CO 2	Interpret & Illustrate user defined C functions and different operations on list of data.	2				2														
		CO 3	Implement Linear Data Structures and compare them.			2																
		CO 4	Implement Binary Trees.			2																
13 ES 106	ENGINEERING MECHANICS	CO 1	Understand the concept of forces and apply the static equilibrium equations.	1															Modified	The objective of this course is to Understand the basic concepts of engineering mechanics		
		CO 2	Analyze co-planar and non co-planar system of forces.	2																		
		CO 3	Apply the concept of centroid & centre of gravity to determine moment of inertia.	2																		
		CO 4	Analyze the rigid bodies under translation and rotation with and without considering forces.	2																		
13 ES 201	THERMODYNAMICS	CO 1	Apply first law of thermodynamics to non flow systems	2															Added	The objective of this course is to Understand the fundamental concepts of thermodynamics		
		CO 2	Apply steady flow energy equation and second law of thermodynamics to various processes and engineering	2																		

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			devices																
			CO 3 apply principle of entropy and thermodynamic relations to thermodynamic system and process	2															
			CO 4 Evaluate the performance of Otto, Diesel, Dual cycles and Refrigeration cycles	2															
13 BS 103	ENGINE ERING PHYSICS	CO 1	Explain how ultrasonic waves are produced and detected, Determine flaws present inside a material using NDT techniques.	1													Modified	The objective of this course is to Understand the fundamental concepts of engineering physics	
		CO2	Compute the magnetic induction produced by current carrying conductors by using Biot-Savart law & Ampere's law, Compute the Lorentz force experienced by a charged particle.	1															
		CO3	Understand different aberrations in lenses and their corrections, phenomenon of interference in thin films of uniform thickness	1															
		CO4	Explain the working of optoelectronic devices like LED, photodiode, photo transistor and solar cells, Explain the phenomenon of superconductivity and its applications	1															

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Annexure-2

COURSE VS POS & PSO'S MAPPING

Course Code	Course Title	L-T-P	CR EDITS	CO	Program Outcomes(POs)						Course Type	Course Objective	
					P	P	P	P	P	P			
					O	O	O	O	O	O			
1	2	3	4	5	6								
11-EM501	Microcontroller s for Embedded System Design.	3-0-2	4	CO1	Understanding the fundamentals of Embedded Systems and its hardware and software architecture.	1						Retained without Changes	The objective of this course is to understand fundamentals of micro controllers
				CO2	Demonstrate the working principle of 8051 microcontrollers and Processor Architecture & Interfacing		1						
				CO3	Analyze PIC Microcontroller Hardware with its Architecture & Interfacing	2				2			
				CO4	Analyze the Device Drivers , Interrupt service Mechanism and Devices & Communication Buses for Devices Network.						2		
12-EM502	Real Time Concepts for Embedded Systems	3-2-0	4	CO1	Understand the current trends for Embedded Systems Design. Hard versus soft Real- Time Systems,A Reference						Retained without Changes	The objective of this course is to understand	

					Model of Real	1							
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Annexure-2

COURSE VS POS & PSO'S MAPPING

Course Code	Course Title	L-T-P	CR EDITS	CO	Program Outcomes(POs)						Course Type	Course Objective	
					PO 1	PO 2	PO 3	PO 4	PO 5	PO 6			
11-EM 501	Microcontrollers for Embedded System Design.	3-0-2	4	CO1	Understanding the fundamentals of Embedded Systems and its hardware and software architecture.	1						Retained without Changes	The objective of this course is to understand fundamentals of micro controllers
				CO2	Demonstrate the working principle of 8051 microcontrollers and Processor Architecture & Interfacing		1						
				CO3	Analyze PIC Microcontroller Hardware with its Architecture & Interfacing	2			2				
				CO4	Analyze the Device Drivers , Interrupt service Mechanism and Devices & Communication Buses for Devices Network.		2			2			
12-EM 502	Real Time Concepts for Embedded Systems	3-2-0	4	CO1	Understand the current trends for Embedded Systems Design. Hard versus soft Real- Time Systems,A Reference						Retained without Changes	The objective of this course is to understand	

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				CO2	Discuss Global System for Mobile Communications (GSM) and Medium Access Control (MAC)	1							
				CO3	Describe Mobile IP and Mobile Ad hoc Networks (MANETs)				1				
				CO4	Understand Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP and Mobile TCP.					1			
11-EM601	Advanced Embedded Processor Architectures	3-2-0	4	CO1	Understand 3 and 5 stage pipelines of ARM	1					Retained without Changes	The objective of this course is to understand the basics of ARM Processor architecture	
				CO2	Apply instructions set of ARM 7 processor using assembly language				2				
				CO3	Understand the AMBA bus architecture	1				1			
				CO4	Understand different advanced ARM cores and analyze their use in SOC applications								1

13-EM602	Digital Signal Processors and Architectures	3-2-0	4	CO1	At the end of the course the student will get familiarised 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 the basics of DSP Architecture s
				CO2	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					
				CO3	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.	1					

				Student will be getting familiarised with applications development process based on DSK5416 development board and various software development tools used.								
				CO4 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		
				CO5 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 to use A/D and D/A converters for serial I/O.						1		
11-EM-60	Hardware Software			CO1 To remember and understand the basic	1						Retained without Changes	The objective of this course

3	e Co – Design				concepts of model, Architecture and programming Language							is to understand the basic concepts of model, Architecture and programming of hardware software co design
				CO2	To remember and understand the Hardware software synthesis algorithms and software partitioning distributed system co-synthesis		1					
				CO3	To understand Architecture Specialization techniques, Architecture for control dominated systems				1			
				CO4	Analyze and apply the techniques of Modern embedded architectures and compilation technologies	2				2		
				CO5	Analyze concurrency coordinating, concurrent computations and verification tools.		2				2	
13-EM 60 4	Linux System Concepts	3-0-2	4	CO1	Apply various various GNU development tools for	2					2	Modified The objective of this course is to

				compiling, debugging and creating libraries.							understand the concepts related to Linux kernel Configuration
				CO2 Understand the concepts related to Linux kernel Configuration and kernel modules		1					
				CO3 Understand various concepts related to User and Kernel Space communication, Interrupt Handling and Kernel Debugging.				1			
				CO4 Analyze various types of device drivers that can be build into the kernel .		2					
				CO5 Create Networking communication between client and server using SOCKET API		3			3		
13-EM-E30	CPLD & FPGA Architectures and Applications	3-0-0	3	CO1 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
				CO2 Understand the architecture and features of FPGA.			1				
				CO3 Understand XILINX FPGAs and Design					1		

					various combinational & sequential logic realization using XILINX FPGAS												
					CO4 Analyze the technologies of Actel FPGAs	2						2					
					CO5 Analyze different Design Applications		2				2						
11-EM - E3 2	Embedd ed Networ king	3-0-0	3	CO1	Understanding the concepts of Embedded Networking Communication Standard protocols: RS 232, RS 485, SPI, I2C bus protocols.	1							Retained without Changes	The objective of this course is to understand			
				CO2	Analyze the US B& CAN based synchronization Techniques	2				2							
				CO3	Applying Ethernet communication protocols for Embedded Systems					2							
				CO4	Apply different wireless sensor networks used in embedded systems.		2										
12-EM - E4 1	System On Chip Architec ture	3-0-0	3	CO1	Understand SoB, SoC & SoP for electronic product in terms of size, cost, performance and reliability.	1						Modified	The objective of this course is to understand the techniques for designing SoCs				
				CO2	Analyze design flow in SoC Environment		2				2						

					and verification of electronic circuits							
					CO3 Understand embedded memories used for SoC Environment	1					1	
					CO4 Analyze the bus architectures of NOCs and routing.	2				2		
					CO5 Understand the techniques for designing MPSoCs and its performance.	1					1	
12-EM - E4 4	Real Time Operating Systems	3-0-0	3	CO1	Understanding the concepts of Embedded Networking Communication Standard protocols: RS 232, RS 485, SPI, I2C bus protocols.	1					Retained without Changes	The objective of this course is to understand the basic concepts of RTOS

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Annexure-3

COURSE VS POS & PSO'S MAPPING

Course Code	Course Title	L - T - P	C E D I T S	C O		Program Outcomes(POs)						Course Type	Course Objective
						PO 1	PO 2	PO 3	PO 4	PO 5	PO 6		
13EM511	Computational Methods and Error Analysis	3-1-0	4	C1	Analyse the errors in numerical calculations	2						Added	The objective of this course is to understand Basics of computational methods and error analysis
				C2	Apply computational methods for curve fitting		2						
				C3	Understand the Numerical differentiation and Numerical Integration				1	1			
				C4	Understand the Matrices and Linear system of equations and finite difference methods		1						
13EM512	Wireless Communications & Networks	3-1-2	5	C1	Remember and understand the mobile and wireless networks	1						Added	The objective of this course is to understand The concepts of wireless comm. & networks
				C2	Understand the concepts of GSM and wireless MAC		1						
				C3	Understand the concepts of MANETs and Mobile IP				1				
				C4	Remember the basics of broadcast systems					1			
13EE1	Sensors and Sensing	3-1-1	4	C1	Remember and understand the sensor fundamentals	1					Added	The objective of this course is to understand the	

				O 2	communication protocols												
				C 3	Understand wired communication and fieldbus						1						
				C 4	Understand the basics of wireless personal area networks							1					
1 3 E M 5 1 7	Wireless Sensor Networks	3 - 1 - 2	5	C 4	Understand different types wireless network their protocols and security issues	1							Added				The objective of this course is to understand different types wireless network their protocols and security issues
				C 4	analysis of difference between wireless networks , hardware devices and disigning issues		2										
				C 4	understand the WSN Gateway and their designing principle						1						
				C 4	understanding of Quality of sensor, Target detection tracking							1					
1 3 E M 5 1 8	Design and Analysis of Algorithms	3 - 1 - 0	4	C 1	Understanding basics of design and Analysis of Algorithm	1							Added				The objective of this course is to understand basics of design and Analysis of Algorithm
				C 2	Analyse the search and sorting methods and greedy methods		2										
				C 3	Design algorithm for shortest path problem and reliable design	2											
				C 4	Analyse NP- Hard and NP- Complete problem						2						
1 3 E M 5 3	Advance d Data Commun ications	3 - 0 - 0	3	C 1	Understanding Digital Modulation Techniques	1							Added				The objective of this course is to understand Advanced protocols in data communication

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3				C O 2	study and Analyse Different protocols of data communication												
				C O 3	understanding different erroe correcting and error detecting technuies								2				
				C O 4	Analysis of multiple techniques TDMA, CDMA,SDMA								2				
1 3 E M 5 3 5	Databas e manage ment systems	3 - 0 - 0	3	C O 1	Understand Basic Concepts of DBMS									Added		The objective of this course is to Understand Basic Concepts of DBMS	
				C O 2	Understanding database Designing models							1					
				C O 3	study the States of transaction and locking techniques												
				C O 4	analyse Database file storage, recovery and failure issues							2					
1 3 E M 5 4 1	Advance d Wireless Networks	3 - 0 - 0	3	C O 1	Remember and Understand the Evaluation of wireless network									Added		The objective of this course is to understand advanced wireless network architectures	
				C O 2	understanding the wireless network architecture and application level signaling								1				
				C O 3	Analyse basic Issues of mobility management												2

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Annexure-3

COURSE VS POS & PSO'S MAPPING

Course Code	Course Title	L - T - P	CREDIT S	C O	Program Outcomes(POs)						Course Type	Course Objective		
					PO 1	PO 2	PO 3	PO 4	PO 5	PO 6				
13EM511	Computational Methods and Error Analysis	3-1-0	4	C O 1	Analyse the errors in numerical calculations	2						Added	The objective of this course is to understand Basics of computational methods and error analysis	
				C O 2	Apply computational methods for curve fitting		2							
				C O 3	Understand the Numerical differentiation and Numerical Integration					1	1			
				C O 4	Understand the Matrices and Linear system of equations and finite difference methods		1							
13EM512	Wireless Communications & Networks	3-1-2	5	C O 1	Remember and understand the mobile and wireless networks	1						Added	The objective of this course is to understand The concepts of wireless comm. & networks	
				C O 2	Understand the concepts of GSM and wireless MAC		1							
				C O 3	Understand the concepts of MANETs and Mobile IP					1				
				C O 4	Remember the basics of broadcast systems						1			
13E	Sensors and Sensing	3-1-1	4	C O 1	Remember and understand the sensor fundamentals	1					Added	The objective of this course is to understand the		

M 5 1 3	Principles	-	0																	sensor fundamentals							
				C O 2	Understand the physical and chemical sensors									1													
				C O 3	Illustrate and understand the optical sensors											1											
				C O 4	Understand the bio sensors													1									
1 3 E M 5 1 4	Data Acquisition and Hardware Networks	3	- 1 - 2	5	C O 1	Analyse the various power supplies and filters used														Added	The objective of this course is to understand the basics of data acquisition						
					C O 2	Understand sensor signal conditioning circuits											1										
					C O 3	Understand the wired communications														1							
					C O 4	Analyse the serial communication process																2					
1 3 E M 5 1 5	MEMS & NEMS	3	- 1 - 0	4	C O 1	Overview of MEMS and Micro Systems															Added	The objective of this course is to understand Basics of MEMS technology					
					C O 2	Understand the Basics of MEMS technology and micro system design															1						
					C O 3	Analyse the micro system design																				2	
					C O 4	Remember and understand the fabrication methods involved																					1
1 3 E M 5 1 6	Communications Protocols and Standards	3	- 1 - 2	5	C O 1	Remember and understand the networks in process automation															Added	The objective of this course is to understand the various communication protocols					
					C	Illustrate the various																			1		

			O 2	communication protocols														
			C O 3	Understand wired communication and fieldbus					1									
			C O 4	Understand the basics of wireless personal area networks						1								
1 3 E M 5 1 7	Wireless Sensor Networks	3 - 1 - 2	5	C O 4	Understand different types wireless network their protocols and security issues	1							Added					The objective of this course is to understand different types wireless network their protocols and security issues
				C O 4	analysis of difference between wireless networks , hardware devices and disigning issues			2										
				C O 4	understand the WSN Gateway and their designing principle					1								
				C O 4	understanding of Quality of sensor, Target detection tracking						1							
1 3 E M 5 1 8	Design and Analysis of Algorithms	3 - 1 - 0	4	C O 1	Understanding basics of design and Analysis of Algorithm	1							Added					The objective of this course is to understand basics of design and Analysis of Algorithm
				C O 2	Analyse the search and sorting methods and greedy methods			2										
				C O 3	Design algorithm for shortest path problem and reliable design	2												
				C O 4	Analyse NP- Hard and NP- Complete problem						2							
1 3 E M 5 3	Advance d Data Commun ications	3 - 0 - 0	3	C O 1	Understanding Digital Modulation Techniques	1							Added					The objective of this course is to understand Advanced protocols in data communication

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3				C O 2	study and Analyse Different protocols of data communication	2							
				C O 3	understanding different erroe correcting and error detecting techniues					2			
				C O 4	Analysis of multiple techniques TDMA, CDMA,SDMA				2				
1 3 E M 5 3 5	Databas e manage ment systems	3 - 0 - 0	3	C O 1	Understand Basic Concepts of DBMS	1					Added	The objective of this course is to Understand Basic Concepts of DBMS	
				C O 2	Understanding database Designing models		1						
				C O 3	study the States of transaction and locking techniques								
				C O 4	analyse Database file storage, recovery and failure issues	2							
1 3 E M 5 4 1	Advance d Wireless Networks	3 - 0 - 0	3	C O 1	Remember and Understand the Evaluation of wireless network	1					Added	The objective of this course is to understand advanced wireless network architectures	
				C O 2	understanding the wireless network architecture and application level signaling		1						
				C O 3	Analyse basic Issues of mobility management					2			

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Annexure-3

COURSE VS POS & PSO'S MAPPING

Course Code	Course Title	L-T-P	CREDITS	CO		Program Outcomes(POs)						Course Type	Course Objective	
						PO 1	PO 2	PO 3	PO 4	PO 5	PO 6			
13EM 511	Computational Methods and Error Analysis	3-1-0	4	CO 1	Analyse the errors in numerical calculations		2						Added	The objective of this course is to understand Basics of computational methods and error analysis
				CO 2	Apply computational methods for curve fitting			2						
				CO 3	Understand the Numerical differentiation and Numerical Integration					1	1			
				CO 4	Understand the Matrices and Linear system of equations and finite difference methods			1						
13EM 512	Wireless Communications & Networks	3-1-2	5	CO 1	Remember and understand the mobile and wireless networks	1							Added	The objective of this course is to understand The concepts of wireless comm. & networks
				CO 2	Understand the concepts of GSM and wireless MAC			1						
				CO 3	Understand the concepts of MANETs					1				

					and Mobile IP													
					CO 4	Remember the basics of broadcast systems										1		
13EM 513	Sensors and Sensing Principles	3-1-0	4		CO 1	Remember and understand the sensor fundamentals	1										Added	The objective of this course is to understand the sensor fundamentals
					CO 2	Understand the physical and chemical sensors		1										
					CO 3	Illustrate and understand the optical sensors						1						
					CO 4	Understand the bio sensors										1		
13EM 514	Data Acquisition and Hardware Networks	3-1-2	5		CO 1	Analyse the various power supplies and filters used	2										Added	The objective of this course is to understand the basics of data acquisition
					CO 2	Understand sensor signal conditioning circuits		1								1		
					CO 3	Understand the wired communications						1						
					CO 4	Analyse the serial communication process		2										
13EM 515	MEMS & NEMS	3-1-0	4		CO 1	Overview of MEMS and Micro Systems	1										Added	The objective of this course is to understand Basics of MEMS technology
					CO	Understand		1										

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				2	the Basics of MEMS technology and micro system design												
				CO 3	Analyse the micro system design					2							
				CO 4	Remember and understand the fabrication methods involved							1					
13EM 516	Communications Protocols and Standards	3-1-2	5	CO 1	Remember and understand the networks in process automation	1							Added			The objective of this course is to understand the various communication protocols	
				CO 2	Illustrate the various communication protocols		1										
				CO 3	Understand wired communication and fieldbus						1						
				CO 4	Understand the basics of wireless personal area networks							1					
13EM 517	Wireless Sensor Networks	3-1-2	5	CO 4	Understand different types wireless network their protocols and security issues	1							Added			The objective of this course is to understand different types wireless network their protocols and security issues	
				CO 4	analysis of difference			2									

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					between wireless networks , hardware devices and disigning issues												
					CO 4 understand the WSN Gateway and their designing principle								1				
					CO 4 understanding of Quality of sensor, Target detection tracking									1			
13EM 518	Design and Analysis of Algorithms	3-1-0	4	CO 1	Understanding basics of design and Analysis of Algorithm	1								Added		The objective of this course is to understand basics of design and Analysis of Algorithm	
				CO 2	Analyse the search and sorting methods and greedy methods								2				
				CO 3	Design algorithm for shortest path problem and reliable design									2			
				CO 4	Analyse NP-Hard and NP-Complete problem									2			
13EM 533	Advanced Data Communications	3-0-0	3	CO 1	Understanding Digital Modulation Techniques	1							Added		The objective of this course is to understand Advanced protocols in data communication		

				CO 2	study and Analyse Different protocols of data communication													
				CO 3	understanding different error correcting and error detecting techniques								2					
				CO 4	Analysis of multiple techniques TDMA, CDMA, SDMA								2					
13EM 535	Database management systems	3-0-0	3	CO 1	Understand Basic Concepts of DBMS									Added		The objective of this course is to Understand Basic Concepts of DBMS		
				CO 2	Understanding database Designing models													
				CO 3	study the States of transaction and locking techniques													
				CO 4	analyse Database file storage, recovery and failure issues													
13EM 541	Advanced Wireless Networks	3-0-0	3	CO 1	Remember and Understand the Evaluation of wireless network									Added		The objective of this course is to understand advanced wireless network architectures		
				CO 2	understanding the wireless network													

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					architecture and application level signaling								
				CO 3	Analyse basic issues of mobility management					2			
				CO 4	Challenges in wireless network Quality of Service						1		
13EM 546	Advanced Microcontroller and its Applications	3-0-0	3	CO 1	Overview of Microprocessor and microcontroller functioning, RISC and CISC processor	1						Added	The objective of this course is to understand the concepts of Advanced Microcontrollers and Applications

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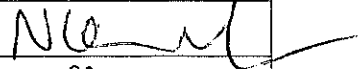




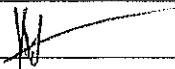
K L UNIVERSITY
DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING
MINUTES OF DEPARTMENT ACADEMIC COMMITTEE MEETING

On 10th May 2013 the DAC in its meeting made the following recommendations to ECM-BOS.

Agenda:

1. To discuss the feedbacks received from stake holders on curriculum
2. To propose the curriculum for B. Tech 2013-14 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.	Prof. N.Venkatram	Chairman	
2.	Dr K.Raghava Rao	Member	
3.	Dr K Srinivasa Ravi	Member	
4.	Dr Md.Ali Hussain	Member	
5.	Dr K Kiran Kumar	Member	
6.	Mr. N V K Ramesh	Member	

The following points were discussed and resolved:

1. The DAC discussed and resolved to recommend adding the Courses in B. Tech (ECM) 2013-14 Batch Curriculum(Annexure-1)
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) 2012-13 curriculum(Annexure-1)


DAC-CHAIRMAN