KLEF

Dept.of Electronics and Computer Engineering

Academic Year 2019-2020

COURSE VS POs & PSOs MAPPING

COURSE CODE	COURSE NAME	CO NO	Description of the Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
19MT1101	MATHEMATICS FOR COMPUTING	CO1	Understand the basic Structures , relations and permutations & combinations , probability	2													
		CO2	Model and solve the relevant physical problems mathematically as a system of linear equations .	2													
		CO3	Apply the rules of Propositional logic to establish valid resultsof mathematical arguments, Induction and solve recurrence relations .	2													
		CO4	understand the graphs and analyze different problems associated with computer , logic design.	2													
		CO5	Describe the Aptitude & Reasoning skills	2													
19CS1101	PROBLEM SOLVING AND COMPUTER PROGRAMMI	CO1	Illustrate how problems are solved using computers and programming.	2	2										2		
		CO2	Illustrate and use Control Flow Statements in C.	2	2										2		
		CO3	Interpret & Illustrate user defined C functions and different operations on list of data.	2	2												
		CO4	Implement Linear Data Structures and compare them.				3										

Code	Course	CO	Description	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	NG	CO5	Apply the knowledge obtained by the course to solve real world problems.	2	2		2											
19ME1103	DESIGN TOOLS WORKSHOP-1	CO1	Practice design thinking by developing artistic skills			2												
		CO2	Visualize and practice innovative design by final drafting using photogrammetric and model the design using prototyping technique				3											
		CO3	Apply the concept of AI & Data analytics & finalize the requirements to design his idea					3										
		CO4	Draft a report of his project from the initial stage & make a report which include scope, time and cost management of his project					3										
19SC1101	TECHNICAL SKILLS - 1(CODING)	CO1	Apply the concepts of basic programming to solve the basic problems, pattern based problems	3	3											3		
		CO2	Build solutions for problems on Numbers and array based	3	3											3		
		CO3	Solve problems solutions for character/string based problems and pointers	3	3											3		
		CO4	Build solutions to programs on Data structures concepts.	3	3											3		
19MT2102	MATHEMATICS FOR ENGINEERS	CO1	Apply differential and integral calculus to find maxima & minima of functions and evaluate the integrals	2														
		CO2	Model and solve the relevant phenomena as a differential equation.	3														
		CO3	Demonstrate Fourier series and Analytic functions	2														
		CO4	Describe probability , Random Variables and Algebraic structures	2														
19SC12	OBJECT ORIE	CO1	Understand basic Concepts of OOP, fundamentals of java and apply the concepts of classes and objects through			3		3										3

Code	Subject	CO	Description															
01	NTED PRO GRA MMI NG		java															
		CO2	Apply access control, Inheritance, Packages.			3		3										3
		CO3	Apply Interfaces, Exception Handling, multi- threading, I/o.			3		3										3
		CO4	Apply collection framework and event driven programming.			3		3										3
		CO5	Apply object-oriented programming concepts to write programs and analyses requiremens and design to implement lab-based project with SDLC in students						4		4	4						4
19 SC 12 02	DAT A STRU CTU RES	CO1	Apply measures of efficiency on algorithms and Analyse different Sorting Algorithms.	4	4											4	4
		CO2	Analyse and compare stack ADT and queue ADT implementations using linked list and applications.	4		4										4	4
		CO3	Analyse the linked implementation of Binary, Balanced Trees and different Hashing techniques.	4		4										4	4
		CO4	Analyse different representations, traversals, applications of Graphs and Heap organization.		4	4										4	4
		CO5	Develop and Evaluate common practical applications for linear and non-linear data structures.	5	5											5	5
19 CS 12 05	COM PUTE R ORG ANIZ ATIO N & ARC HITE CTU RE	CO1	Understanding of computer system and its modules				1									1	
		CO2	Understanding the CPU Design				2									2	
		CO3	Applications of Input/Output Devices				3									3	
		CO4	Applications of RISC and CISC paradigm				4									4	
19 SC 12	TEC HNIC AL	CO1	Apply the concepts of basic programming to solve the basic problems, pattern based	3	3											3	

				Statement	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
07		SKILLS - 2(CODING)		problems															
			CO2	Build solutions for problems on Numbers and array based problems,functions, recursion	3	3												3	
			CO3	Solve problems solutions for character/string based problems	3	3												3	
			CO4	Build solutions to programs on Data structures concepts.	3	3												3	
	19SC1209	DESIGN TOOLS WORKSHOP-2	CO1	Practice the design ideology by artistic skill			2												
			CO2	Visualize the design ideology by using VR technology				3											
			CO3	Visualize the design ideology by incorporating VR technique					3										
			CO4	Visualize and present his design idea by applying AR technique				3											
	19CS2106	OPERATING SYSTEMS	CO1	Understanding the basic algorithms for subsystem components				2							2				
			CO2	Understand memory and process virtualization				2							2				
			CO3	Design and solve synchronization problems, and multi-threading llibraries				3							3				
			CO4	Understand persistence concepts				2							2				
			CO5	Develop application programs using different platforms and languages					5										5
	19CS2211	SOFTWARE ENGINEERING	CO1	Understand the software development life cycle and associated process models and reverse engineering	2	2													
			CO2	Illustrate Requirement modelling and Agile and Extreme programming		3	3												
			CO3	Examine Agile Models such as Scrum, Kanban and SAFe methodology	4	4													
			CO4	Categorize various testing strategies, Test Driven Development and CMMI,SIX SIGMA TECHNIQUES	4	4													

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18EC2103	ANALOG ELECTRONIC CIRCUIT DESIGN	CO1	Analysis of BJT's and Various application in Amplifiers	1		1									
		CO2	Understand various types of FET's, IC Types and analyze FET as an Amplifier	2		2									
		CO3	Understand the Linear & Non-linear application of Op-AMP and analyze active filters	2		2									
		CO4	Analysis of different types of oscillators, filter and regulators.	1		1									
		CO5	Design and Testing of Analog circuits for realistic applications			3									
18EC2205	EMBEDDED CONTROLLERS	CO1	Understand the architecture and programming concepts of 8086 Microprocessor	2	2										
		CO2	Apply the Programming concepts of 8051 Microcontroller	3	3										
		CO3	Analyse the Interfacing of Peripherals to the 8051 microcontrollers through programming. Understand the basic architectures of PIC and ARM 7 microcontrollers		4	4									
		CO4	Understand the basic concepts of CORTEX STM-32 microcontroller and RTOS		2	2									
		CO5	Analyze the applications of programming with 8051 and 8086 on hardware / software. Analyze the applications of programming with Arduino		4	4									
18EC3110	ELECTRONIC WORKSHOP-I(ELECTRONIC SYSTEM DESI	CO1	Capable to understand the electronic system design process, analyze the heat management system and understand the soldering techniques.	2		2									
		CO2	Able to understand PCB fabrication process, PCB artwork and various protection methods for electronic systems.	2		2	2								
		CO3	Able to understand Raspberry Pi microcontroller and its applications	4		4	4								

		CO	Description															
	GN WOR KSH OP)	CO4	Able to understand product making steps, the noise reduction designs in components & circuits, high frequency designs and CAD packages	2			2											
		CO5	Recognizing the software tool and PCB fabrication steps to implement an electronic system. Recognizing the software tool and Raspberry Pi microcontroller board to implement a few specific applications.												4			
19 TS 20 1	SKIL LING FOR ENGI NEE RS- 1(IT CODI NG/H ARD WAR E CODI NG)	CO1	Introduction to GSD and Lab VIEW Environment such as Front Panel, Controls Palette, Controls and Indicators, Block Diagram Terminals, Functions Palette, Data Type, Boolean Operations, String Operations.	1	1													
		CO2	Introduction to Loop Concept, Nested Loop, Feedback, Arrays, Cluster, Plotting Data using chart and Graph, Tunnel Concept, Introduction to parallelism, Local Variable, Global Variable, Property Nodes, Invoke Nodes using Lab VIEW	2	2													
		CO3	Introduction to Case structures, Case Control using Enumerated data type, Introduction to Flat Sequence, Create New Sub VI, Input and Output Sub VI Connectors, Error handling and Debugging Techniques, Introduction to File I/O operations, Event Structure and operations, Design Technique, Introduction to Architecture, Synchronization and Communication using Lab VIEW.		2	2													

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		CO4	Simulation Using MultiSim Instruments such as Multimeter, Function Generator, Wattmeter, Bode plotter, Introduction to Measurement Probe and Current Probe in MultiSim, Operations on Simulation Analysis such as AC analysis, DC operating Point, Fourier Analysis, Noise Analysis, Distortion Analysis, Parameter Sweep, Transfer Function, Worst case Execution using MultiSim			2		2										
19 CS 21 09	COMPUTER NETWORK AND SECURITY	CO1	Understand OSI and TCP/IP models	1												1		
		CO2	Illustrate the Link, MAC and Network layer concepts.	2		2										2		
		CO3	Illustrate Transport and Application layer concepts	2		2												2
		CO4	Understand and Apply Network Security Techniques.			3		3										3
19 BT 41 62	MATHEMATICAL PROGRAMMING-I	CO1	Understand the use of mathematical programming the concept of linear programming and second order cone programming	1	2			3										
		CO2	Analyse and bulid semi definite and conic programming		2			2										
		CO3	Build geometric and integer programming		2			2										
		CO4	Apply fractional and non linear programming		2			2										
		CO5	Implementing the optimisation techniques with matlab		3			4										
19 BT 41 62	DATABASE MANAGEMENT	CO1	Acquire knowledge on database systems		2													
		CO2	Apply SQL in relational model		3													

Code	Subject	CO	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13
	SYST EMS	CO3	Compare data storage devices			3										
		CO4	Analyze current trends in data types											4		
19 ME4 10 5	ARTI FICA L INTE LLIG ENC E	CO1	Introduction to AI, Understand about intelligence, knowledge and Artificial Intelligence, techniques of AI as a State space search, Production Systems.	2		2										
		CO2	Problem solving by Search, Heuristic Search, Randomized search techniques and Finding Optimal paths		2		2									
		CO3	Analyze the appropriate methodologies for problem decompositions, planning and constraint data constraint satisfactions.	3			3									
		CO4	Understand Knowledge Representation using Predicate Logic, Representing Knowledge using Rules, Semantics Nets, Frames and Conceptual dependencies.	2	2											
19 E M 22 01	WEB APPL ICAT ION DEV ELOP MEN T	CO1	Able to create Static Web pages using basic HTML &apply CSS		6		6									6
		CO2	Able to apply JavaScript features for form validations and event handling		3		3									3
		CO3	Able to create databases using MYSQL and apply JDBC concepts to connect to a database.		6		6									6
		CO4	Able to create dynamic web pages using servlets & JSP		6		6									
		CO5	Must be able to design WEB site considering the user interface, navigation and interaction with the database using project-based LABS		6		6									6
19 ES 22 04	DAT A SCIE NCE	CO1	Understand Data science, Exploratory Data Analysis, Data Extraction, Wrangling	2		2									2	
		CO	Demonstrate proficiency with statistical analysis of data				2	2							2	

Code	Course	CO	Description	1	2	3	4	5	6	7	8	9	10	11	12	13
			(continued)	2												
		CO3	Analyse the linear and logistic regression solutions for real world problems			4	4							4		
		CO4	Examine the inference from Time series models, integrate R and Hadoop			4	4							4		
		COS	Implement the Statistical and Data Analytical Algorithms using R									6				
18 EC 22 08	VLSI DESIGN	CO1	Understand the MOS device fabrication process		2	2										
		CO2	Analysis of MOS operation principles, characteristics and scaling process		3	3										
		CO3	Constructing the Transistor Level Logic circuits and understand the MOS layout design rules		3	3										
		CO4	Study of MOS circuit performance and testing principles			3	3									
		CO5	Create the MOS circuit modules through project-oriented approach using e-CAD tools				4									
	MATHEMATICAL PROGRAMMING-II	CO1	Infinite-Dimensional optimization and catenoid identification methods	3	3			3								
		CO2	Heuristics & Metaheuristics	3	3			3								
		CO3	Evolutionary & Memetic algorithms for optimization		3			3								
		CO4	Constraint Programming & penalty function	3	3			3								
		CO5	Implementation of Functional Approaches & mathematical programming for optimization		3			3								
19 UC 00 08	INDIAN CONSTITUTION	CO1	To understand Constitutional development after Independence											2		
		CO2	To learn the fundamental features of the Indian Constitution											2		
		CO3	To get a brief idea of the powers and functions of Union and State Governments											2		

Code	Course	CO	Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		CO4	To understand the basics of working of Indian Judiciary and the Election Commission													2		
	SIGNAL PROCESSING	CO1	Understand basic concepts related to Signal Processing System	2													2	
		CO2	Ability to Analyse the Signal Processing Algorithms	3													3	
		CO3	Ability to Analyse the Filter design Methodologies	3													3	
		CO4	Ability to Analyse Signal Processing algorithms in different case studies	3													3	
19UC0009	ECOLOGY AND ENVIRONMENT	CO1	Understand the importance of Environmental education and conservation of natural resources.				1											
		CO2	Understand the importance of ecosystems and biodiversity.											1				
		CO3	Apply the environmental science knowledge on solid waste management, disaster management and EIA process.				3											
		CO4	Understand the importance of Environmental education and conservation of natural resources.				1											
19EM5104	WEB INTELLIGENCE	CO1	Able to understand the basic concepts of world wide web and supported new artificial intelligence				2											2
		CO2	Ability to understand artificial intelligence and neural network-based web monitoring				3											3
		CO3	Analyze web-based BISC decision support in the web				3											3
		CO4	Analyse social networking intelligence				3											3
19EM5105	WEB PROGRAMMING WITH	CO1	Able to understand Python and Django, Working with templates and models				2											2
		CO2	Able to get the data from data base and working with query sets				2											2
		CO3	Able to use Django Forms, creating view CBV				3											3

Code	Course	CO	Description															
	PYTHON AND DJANGO	CO4	Able to handle session with middleware.				3											3
		CO5	Must be able to create Django project and application development				6											6
19EM5106	FUNDAMENTALS OF ANGULARJS	CO1	Able to understand when to use AngularJS services instead of controllers				2											2
		CO2	Able to implement single-page applications, using Route to selectviews and navigation				3											3
		CO3	Able to create applications that can communicate with a server to fetch and store data	6			6											6
		CO4	Able to create custom angularjs filter and perform unit testing directives	6			6											6
		CO5	Must be able to develop a large, maintainable, and performant application with AngularJS.	6			6											6
19EM52013	FUNDAMENTALS OF MONGODB	CO1	Able to understand NoSQL databases and MongoDB use cases				2											2
		CO2	Able to understand different concepts of data modelling in MongoDB				2											2
		CO3	Able to import and export data from/ to MongoDB				2											2
		CO4	Able to understand the replica set and concept of sharing in MongoDB				2											2
		CO5	Must be able to build data models and data access patterns using MongoDB				6											6
18EM5105	WEB SERVICES	CO1	Acquire fundamental knowledge related to developing an application using the WEB services related Technologies.				2											2
		CO2	Acquire fundamental knowledge related to various technologies used for implementing WEB services that include SOAP, WSDL, and UDDI				2											2
		CO3	Should be able to develop small WEB services-oriented applications through the use of XML language				3											3
		CO4	Should be able to develop applications using third part services which are launched on different servers				3											3
		CO5	Must be able to develop a large, maintainable, and perform applications	6			6											6

Code	Course	CO	Description	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
19EM5212	BIGDATA ANALYTICS	CO1	Ability to find and transmit data emanated from different embedded and IoT devices				2								2
		CO2	Ability to use HADOOP and MAP reduce tools in the process of undertaking Analytics				4								4
		CO3	Ability to develop data Modelling, Structuring and Analytics using "R" Language				4								4
		Co4	Ability to conduct various kinds of analytics on the big data especially using text				4								4
19EM5101	EMBEDDED SYSTEM DESIGN WITH ARM	CO1	Able to describe the architecture of ARM7 Processor (LPC2148)	2											
		CO2	Able to interface various devices to ARM processor and program the same using Embedded C Language		4										
		CO3	Able to describe Interrupts and A/D, D/A of ARM7 Controller		2										
		CO4	Able to interface various devices through Communication protocols		4								4		
19EM5102	EMBEDDED LINUX	CO1	Able to Understand the Linux operating system	2											
		CO2	Able to understand and apply file system structures and Linux root file system		4										
		CO3	Able to understand kernel, Boot initialisation and Thread concepts.		4										
		CO4	Able to understand and apply device drivers for various applications, interfacing and optimisation techniques		4								4		
18EM5103	NETWORKING OF EMBEDDED SYSTEMS	CO1	Able to understand and describe serial communication protocols using 8051 and LPC2148 controllers.	2											
		CO2	Able to understand and describe I2C and USB communication protocols.		4										
		CO3	Able to understand and describe CAN communication protocol		4										
		CO4	Able to understand and describe wireless communication protocols		4								4		
	HARDWARE SOFTWAR	CO1	Able to understand hardware and software codesign models	2											
		CO2	Able to understand the different methodologies for hardware/software codesign		2										

Code	Course	CO	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	E COD ESIG N	CO3	Able to understand the interfacing techniques for hardware and software.	2													
		CO4	Able to understand the high-level synthesis model and analyze RTL optimization.	4													4
19 E M 52 12	SYST EM ON CHIP	CO1	Able to understand the system architecture concepts	2													
		CO2	Able to understand the requirements for processor selection strategies.	2													
		CO3	Able to understand the requirements for memory selection strategies for SoC development.	2													
		CO4	Able to understand the bus architectures and interconnect architectures and analyze the different case studies	4													4
19 E M 52 13	EMB EDD ED SECU RITY	CO1	Able to understand security trends and policies	2													
		CO2	Able to understand embedded operating system security techniques.	3													
		CO3	Able to understand and describe software security developments and upgrades.	2													
		CO4	Able to understand and describe cryptography techniques.	3													
19 E M 51 01	FUN DAM ENT ALS OF IOT	CO1	Understand functional blocks of IoT devices						2								2
		CO2	Demonstrate the Technologies involved in IoT based Systems						2								2
		CO3	Apply different wireless technologies used for the development of IoT based Networks						3								3
		CO4	Analyse various IOT Real time application design Components						4								4
19 E M 51 07	IOT:S ENSI NG AND ACTI VATI NG DEVI	CO1	Understand the role of sensor and actuators in real time aspects and Analog and Digital Actuators			2											2
		CO2	Analyse the role of signal conditioning circuits and Impedance Matching circuits			2											4
		CO	Understand different generation of sensors for the development						2								2

Code	Course		CO	Course Outcome															
	CES		CO3	of IoT based Networks																
			CO4	Analyse the role of different Energy sources and power management in IoT			4									4				
19 EM 5108	IOT ARCHITECTURE AND PROTOCOLS		CO1	To Understand the Architectural Overview of IoT						2						2				
			CO2	To Understand the IoT Reference Architecture and Real World Design Constraints						2						2				
			CO3	To Apply the various IoT Protocols in Datalink and Network layers						3						3				
			CO4	To Apply the various IoT Protocols in Transport and Session Layers						3						3				
18 EM 5109	WIRELESS SENSOR NETWORKS		CO1	To Understand the Architectural Overview of IoT		2										2				
			CO2	To Understand the IoT Reference Architecture and Real World Design Constraints						2						2				
			CO3	To Apply the various IoT Protocols in Datalink and Network layers			4									4				
			CO4	To Apply the various IoT Protocols in Transport and Session Layers						2						2				
19 EM 5214	CLOUD COMPUTING FOR IOT		CO1	To understand the differences between traditional deployment and cloud computing						2									2	
			CO2	Understand different cloud infrastructures and service models							2								2	
			CO3	Apply the concepts of data analytics						3									3	
			CO4	Analyze the statistical data analysis and methods for evaluation							4								4	
18 EM	E-COMMER		CO1	Should gain fundamental knowledge related to development of E-commerce sites / portals						1										

Code	Subject	CO	Description														
40 B2	CE	CO2	Should be able to design, develop and Host small e-commerce sites /portals							2							
		CO3	Should be able to implement security enforcement mechanisms within e-commerce sites /portals					1									
		CO4	Should be able to implement different payment mechanisms within e-commerce sites / portals					2									
18 EM 40 B3	WEB TECHNOLOGIES	CO1	Able to create Static Web pages using basic HTML & apply CSS						3								
		CO2	Able to apply JavaScript features for form validations and event handling						3								
		CO3	Able to create databases using MYSQL and apply JDBC concepts to connect to a database.						3								
		CO4	Able to create dynamic web pages using servlets & JSP						1								
		CO5	Must be able to design WEB site considering the user interface, navigation and interaction with database using project based LABS									3					
18 EM 40 B1	LINUX PROGRAMMING	CO1	Must have full understanding of Linux Commands and Bourn shell programming						2								
		CO2	Ability to develop Bourn shell programs interfaced with LINUX utilities							2							
		CO3	Ability to develop Bourn shell programs interfaced with SED and AWK user interface systems and File management systems					2									
		CO4	Ability to develop Bourn shell programs that implements inter process communication and process management					2									