

## Koneru Lakshmaiah Education Foundation (Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

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**Electronics and Computer Science** B.Tech

**COURSE VS POS & PSOS MAPPING** Y21 Admitted Batch

	A POUS WAFFII	10	121 Admitted Batch														
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
	onal	CO1	Understand the concepts of grammar and to improve communication skills in reading and writing.	1	ı	-	-	-	ı	ı	ı	ı	1	-	ı	ı	-
11101	rofessi lish	CO2	Demonstrate the ability in interactive skills of speaking and writing that are better suited for corporate environment.	1	-	-	-	-	-	-	-	1	-	-	-	-	-
20UC1	Integrated Professional English	CO3	Understand various strategies of reading and use them in interpreting the text.	-	-	-	-	-	-	-	-	2	-	-	-	-	-
	Integ	CO4	Apply the concepts of writing to draft corporate letters, emails and memos, reports, etc.	-	-	-	-	-	-	-	-	-	2	-	-	-	-
70	Ś	CO1	Demonstrating different inter personal skills for employability	-	-	-	-	-	-	-	1	-	-	-	-	-	-
:1202	Jish	CO2	Distinguishing business essential skills	-	-	-	-	-	-	-	-	2	-	-			-
20UC1.	English Proficiency	CO3	Classifying social media and corporate communication skills	-	-	-	-	-	-	-	-	-	-	-	1	1	-
76	Pr	CO4	Applying analytical thinking skills	-	-	-	-	-	-	-	-	-	-	-	2	1	-
	lls ty	CO1	Identify and organize sentence structures based on grammar	-	-	-	-	-	-	-	-	-	-	-	1	1	-
103	Skills	CO2	Illustrate specific writing styles	1	ı	-	-	-	1	1	1	1	-	-	1	1	-
JC2	tial for loya	CO3	Relate intra personal skills	-	-	-	-	-	-	-	-	-	-	-	2	-	-
2100	Essential Skills for Employability	CO4	Interpret inter personal Skills for developing oral communication	-	-	-	-	-	-	-	-	-	-	-	2	-	-
504	Corporate Readiness Skills		Extend word power for developing effective speaking and writing skills	1	-	-	-	-	1	1	-	1	-	1	1	1	-
UC2204	Corporate idiness Sk	CO2	Differentiate critical and general reading skills	1	-	-	-	-	-	1	-	-	-	-	1	1	-
21U	Con	CO3	Interpret inter personal skills	-	1	-	-	-	1	-	-	-	-	-	2	-	-
	Re	CO4	Demonstrate necessary skills to be employable	-	1	-	-	-	1	-	-	-	-	-	2	-	-
01	fuman & Ethics	CO1	Realize and Understand the basic aspiration, harmony in the human being.	1	ı	-	-	-	1	ı	1	1	-	-		ı	-
1UC001	Universal Human Values & Professional Ethics	CO2	Envisage the roadmap to fulfill the basic aspiration of human beings.	-	1	-	-	-	ı	1	-	-	-	-	-	-	-
21	Iniv V	CO3	Analyze the profession and his role in this existence	-	2	-	-	-	-	-	-	-	-	-	-	-	-
	U. Pr	CO4	Understand the profession and his role in this existence	-	-	-	-	1	-	-	-	-	-	-	-	-	_

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	Sultur		Familiarizing students with various aspects of Indian culture and how they contribute to the concept of Unity in Diversity	-	-	-	-	-	1	-	-	-	-	-	-	-	-
20007	Indian Heritage and Culture		Understand the beginnings of Indian History and the developments during the Ancient period	-	-	-	-	-	1	-	-	-	-	-	-	-	-
20UC0007	Heritag		Understand the developments in India during the Medieval Age along with how they contributed to Indian civilization	-	-	-	-	- 1	1	- 1	-	- 1	-	-	1	-	-
	Indian	CO4	Understand the reasons for colonial rule over India and how independence was achieved from British rule	-	-	-	-	1	1	ı	-	1	-	-	1	-	-
	ıtion		To acquire knowledge of the historical developments that culminated in the drafting of the Indian Constitution.	-	-	-	1	1	1	I	ı	1	ı	-	ı	-	-
800	stitu	CO2	To understand the basic features of the Indian Constitution.	-	-	-	-	-	1	-	-	-		-	-		-
20UC0008	Indian Constitution		To understand the structure of the Federal government as defined by the Indian Constitution.	-	-	-	-	1	1	1	-	1	-	-	ı	-	-
	Indi		To understand the Indian Judicial system and election commission of india	-	-	-	-	-	1	-	-	-	-	-	-	-	-
66	Ecology & Environment		Understanding the importance of Environmental education and conservation of natural resources	-	1	1	-	1	-	1	-	1	-	-	ı	-	-
000	)gy	CO2	Understanding the Ecosystems, biodiversity	1	-	1	-	-	-	-	-	-	-	-	-	-	-
20UC0009	colc	CO3	Understand global Environmental issues, pollution	1	-	1	-	-	-	-	-	-	-	-	-	-	-
50	E E	CO4	Understand the knowledge on solid waste management, disaster management and EIA process	1	-	2	-	-	-	-	-	-	-	-	-	-	-
	ion		Develop a better understanding of important issues related to gender in contemporary India	1	-	-	-	1	-	ı	-	1	-	-	1	-	-
20011	Gender Sensitization	CO2	Sensitize to basic dimensions of the biological, sociological, psychological and legal aspects of gender.	-	2	-	1	1	-	I	ı	1	ı	-	ı	-	-
21UC001	nder Se	CO3	Attain a finer grasp of how gender discrimination works in our society and how to counter it.	-	-	2	-	1	-	1	-	1	-	-	ı	-	-
	Ge	CO4	Acquire insight into the gendered division of labor and its relation to politics and economics.	-	-	-	1	1	-	ı	-	1	-	-	ı	-	-
	outing	CO1	Model a system of equations for real world applications in engineering, physical and biological sciences, computer science, finance, economics and solve them through matrix algebra		-	-	-	-	-	-	1	1	-	-	1	1	-
20MT1101	Mathematics for Computing	CO2	Model basic and computational techniques on discrete structures like relations, orders, functions & FSM, Lattices, and propositional &predicate logic	2	-	-	-	-	-	-	-	-	-	-	-	1	-
20MT	natics	CO3	Model real world structures and their related applications using advanced discrete structures like graphs and trees.	1	-	-	-	-	-	-	-	-	-	-	-	2	-
	Mather	CO4	Model the given Statistical data for real world applications in Engineering science, Economics and Management.	3	-	-	-	-	-	-	-	-	-	-	-		-
	<u> </u>	CO5	Demonstrate the Aptitude and Reasoning skills (Tests in skilling hours)	3	-	-	-	-	-	-	-	-	-	-	-	2	-

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102	Mathematics for Engineers	CO1	Apply differential and integral calculus to find maxima & minima of functions, evaluate the integrals and solve the differential equations.	2	-	-	-	-	-	-	-	-	-	-	-	2	-
21MT2102	thematics Engineers	CO2	Demonstrate the Fourier series and Laplace transforms.	2	-	-	-	-	-	-	-	-	-	-	-	2	-
11.	ther	CO3	Describe probability, Random Variables	1	-	-	-	-	-	-	-	-	-	1	-	3	-
	Ma	CO4	Explain complex variables, analytic functions and introduction to stochastic process and Algebraic structures.	2	-	-	-	-	-	-	-	-	-	ı	-	2	-
	tics	CO1	understand the terminologies of basic probability, two types of random variables and their probability functions	2	2	-	-	-	-	-	-	-	-	-	-	2	-
101	l Statis	CO2	observe and analyze the behavior of various discrete and continuous probability distributions		1	1	-	-	-	-	-	-	-	-	-	1	-
21MT3101	lity and	CO3	understand the central tendency, correlation and correlation coefficient and also regression	1	1	-	-	-	-	-	-	-	-	1	-	1	-
2	Probability and Statistics	CO4	apply the statistics for testing the significance of the given large and small sample data by using t- test, F- test and Chi-square test	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P	CO5	Implement probability and statistics using R language	1	1	-	-	-	-	-	-	-	-	1	-	1	1
63	king tion	CO1	Understand the importance of Design thinking process for contextualized problems	-	1	-	-	2	-	-	-	-	-	-	-	-	1
21UC1203	hin	CO2	Analyze, define, and ideate for solutions	-	-	1	-	-	-	2	-	-		-	-	-	2
nc	zn T Inn	CO3	Develop and test the prototype made	-	-	-	-	1	-	3	-	-		-	-	-	2
21	Design Thinking and Innovation	CO4	Explore the fundamentals of entrepreneurship skills for transforming the challenge into an opportunity	-	-	-	-	2	-	-	3	-	-	1	-	-	1
101	Science Elective - I (SemiConduct or Physics)	CO1	Understand semiconductor in terms of its electrical and optical properties	2	2	-	-	-	-	-		-	_	ı	-	-	1
21PH1101	Science Elective - semiCondi or Physics	CO2	Understand junction properties of semiconductor device.	1	1	-	-	-	-	-	-	-	-	-	-	-	1
21P	Sc Ele Sem	CO3	Understand the characteristics of devices like BJT, FET		1	1	-	-	-	-	-	-	-	1	-	-	1
	1(S	CO4	Understand the applications of photonic devices.		2	2	-	-	-	-	-	-	-	1	-	-	2
	ring	CO1	Predict potential complications from combining various chemicals or metals in an engineering setting	2	-	2	-	-	-	1	-	-	-	1	-	-	1
	- 2(Engineering istry)	CO2	Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena	2	-	2					-	-	-	-	-	-	1
21CY1001	ective - 2(E	CO3	Examine water quality and select appropriate purification technique for intended problem	1	-	-	-	-	-	1	-	-	-	-	-	-	1
210	Science Elective Chemi	CO4	Explain the role of chemical kinetics in the formation and destruction of ozone in the atmosphere and predict the connection between molecular behavior and observable physical properties.		-	-	-	-	-	2	-	-	-	-	-	-	2
		CO5	An ability to analyze and generate experimental skills	1	-	-	2	-	-	-	-	-	-	-	-	-	1
	kills-I	CO1	Apply the concepts of mathematical principles besides logic and identifying certain basic mathematical formulae to solve these kinds of problems	-	-	-	-	-	-	-	-	-	-	-	1	-	-

21UC3105	Problem Solving Si	CO2	Formulate the concepts of mathematical principles of equations that contain the data related to real life situations which requires basic logic to analyze		-	-	-	-	-	-	-	-	-	-	2	-	-
21	Problem	CO3	Solve concepts of Venn diagrams and number patterns and illustrate logic behind connectives, series, and analogies respectively	-	,	-	-	1			•		ı	1	1	-	1
		CO4	Differentiate assumptions and arguments in critical reasoning	-	-	-	-	-	-	-	-	-	-	-	2	-	-
	I	CO1	Implement problem solving ability through analyzing the given data and formulate solutions for real world problems based on time, travel and wages		1	-	-	1	-	-	-	-	-	-	1	-	-
21UC3206	Problem Solving Skills-II	CO2	Determine the fundamental concepts of areas, volumes and derive solutions using simple mathematical principles besides interpreting the data through smart tricks to check the number analytics		ı	-	-	ı	-	-	-	-	1	1	2	-	-
211	Problem S	CO3	Estimate inductive reasoning, to categorize the rules-set from a given list of observations and relate them to predict the conclusions according to the given conditions		1	1	-	ı	1	1	ı	1	ı	1	1	-	1
		CO4	Integrate verbal and non-verbal reasoning and to identify the logic behind the given arrangement based on the given conditions to bring out the possible outcome	-	•	-	-	1			•	1	1	1	1	-	,
	i.	CO1	Design Basic and Complex Building Blocks for real world problems using structured programming paradigm	1	2	-	-	1	-	-	1	-	-	-	1	-	-
	ing fo	CO2	Translate computational thinking into Logic Design for Solving real world	1	2	-	-	1		,	-	1	1	-	1	-	-
101	Thinking for Design	CO3	Apply and Analyse CRUD operations on Basic Data Structures using Asymptotic Notations	1	2	-	-	-	1	-	-	-	-	-	-	-	-
21SC1101	putational Thinkin Structured Design	CO4	Apply and Analyse CRUD operations on Linear Data Structures using Asymptotic Notations.	1	2	-	2	-	-	-	-	-	-	-	-	-	-
7	Computational Structured	CO5	Apply the structured programming paradigm with logic building skills on Basic and Linear Data Structures for solving real world problems	1	2	-	2	-	-	-	-	-	-	-	-	-	-
		CO6	Skill the students in such a way that students will be able to develop logic that help them to create programs as well as applications in C	1	2	-	2	ı	-	-	-	-	-	-	-	-	-
	cessors	CO 1	Understand numerical and character representations in digital logic, number system, data codes and the corresponding 8design of arithmetic circuitry. Understanding Logic gates, Logic theorems, Boolean algebra and SOP/POS'S expressions.	1	-	-	-	-	-	-	-	-	-	-	-	-	1
20EC1101	ital Logic & Processors	CO 2	Combinational systems design using standard gates and minimization methods	1	1	-	-	ı	-	-	-	ı	-	-	-	-	1
20]	Log	CO 3	Sequential systems: Design of counters using flip flops.	1	-	-	-	-	-	-	-	-	-	-	-	-	1
	jital	CO 4	Understanding PLA's, PAL's, FPGA's, and processors	-	2	-	-	-	-	-	-	-	-	-	-	-	1

1	l on		1						ı	-				1	1		
	Dig	CO5	Analysing and realization of Boolean functions, half adder, encoders, decoders, flip flops, and counters.	-	-	-	-	3	-	-	1	-	1	ı	ı	1	2
3	Design Tools Workshop	CO 1	Practice design thinking by developing artistic skills, Visualize and complete his/her innovative design by final drafting using 3D modeling	-	-	1	-	1	-		-	1	1	-	•	1	-
20ME1103	ols We	CO 2	Understand the concept of web page, web browser, web server, and able to create Static webpages	-	-	-	-	1	-	-	-	-	-	-	-	-	-
20N	gn To	CO 3	Understand the concept of report writing using a markup language Latex	-	-	-	-	2	-	1	-	-	-	-	-	-	-
	Desi	CO 4	Understand the concept of data visualization and creating data visualization dashboards, Understand the basic concept of VR/AR	-	-	-	-	1	-	-	1	-	-	-	1	-	-
	I	CO1	Practice the design ideology by 3D printing, 3D scanning techniques	-	-	1	-	-	-		-	-	-	-	-	-	-
21SC1209	Design Tools Workshop – II	CO2	Visualize the design ideology by incorporating VR technique and VR technology, Visualize and present his design idea by applying AR technique and Hologram		-	1	-	-	-	=	ı	-	-	-	-	-	-
21	Des	CO3	Practice of PCB technology	-	-		2	-	-	-	-	-	-	-	-	-	-
		CO4	Practice of Arduino based skill with different interfaces	-	-		2	-	-		-	-	-	-	-	-	-
	S	CO1	Understand various sorting algorithms and analyze the efficiency of the algorithms	2	-	2		-	-	-	-	-	-	-	-	2	-
02	ture	CO2	Implement Linear Data Structures and Demonstrate their applications.	-	-	-	2	2	-	-	-	-	-	-	-	2	-
C12	truc	CO3	Understand hashing techniques and Implement tree data structures.	-	-	-	2	2	-	-	-	-	-	-	-	1	-
21SC1202	Data Structures	CO4	Understand graph data structures and apply graphs to solve problems	-	-	-	2	2	-	-	-	-	-	-	-	1	-
	Da	COS	Develop and evaluate common practical applications for linear and nonlinear data structures.	-	-	-	-	-	-	-	-	-	-	2	-	1	-
	on &	CO1	Understand the functionality of CPU functional units - control unit, registers, the arithmetic and logic unit, instruction execution unit	1	-	-	-	1	-	-	1	-	-	1	-	-	1
202	unizati	CO2	Understand the concepts of CPU and the operation of main, cache and virtual memory organizations	1	-	-	-	2	-	-	ı	-	ı	-	-	ı	1
21EC1202	uter Organiza Architecture	CO3	Understand the concepts of the different types of I/O modules and I/O transfer techniques in computer modules	1	-	-	-	2	-	-	1	-	-	-	-	-	2
~	Computer Organization & Architecture	CO4	Apply the concept of pipelining in instruction execution and design issues of RISC, CISC and parallel computing architectures	1	-	-	-	1	-	-	-	-	-	-	-	-	2
		001	Understand basic Concepts of OOP, and apply the concepts of classes and	2	_			2									
	۵.″	CO1	objects through Java	3	3	-	-	2	-	-	-	-	-	-	-	-	_
02	bbject Orienteo	CO2	Apply access control, Inheritance, Packages.	3	3	-	-	3	-	-	-	-	-	-	-	2	
21EL2102	Orić	CO3	Apply Interfaces, Exception Handling, multi-threading, I/o.		3	-	-	2	-	-	í	-	-	-	-	2	
1EI	ect (	CO4	Apply collection framework and event driven programming.	3	3	-	-	3	-	-	-	-	-	-	-	2	
2	Object Oriented Programming	CO5	Apply object-oriented programming concepts to write programs and Analyses requirements and design to implement lab-based project with SDLC in a group of students.		3	-	-	3	-	-	-	-	-	-	-	2	-
		CO1	Understand the basic electronic components.	1	3			2	_		_	_				1	
)3	)f ic s	COI	Onderstand the basic electronic components.	1		_			-	-	-	_	-	-	-	1	

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212	esign of Basic lectron	CO2	Understand the basic circuit analysis techniques	1		-	-	2	-	-	-	-	-	-	-	1	-
1EC120	Design ( Basic Electron Circuits	CO3	Understand the active circuit elements and working.	1		-	-	2	-	-	-	-	-	-	-	1	-
2	П	CO4	Analyse the applications of semiconductor devices	1		-	-	2	-	-	-	-	-	-	-	1	-
_	u S	CO1	Understand the BJT operations and a circuit function.	1	-	-	1	-	-	-	-	-	-	-	-	1	-
21EC2104	onic ss & sesi	CO2	Understand the FET operations and circuit functions	1	-	-	1	-	-	-	-	-	-			1	-
	ctro vice it L	CO3	Understand the OpAmp operations and circuit functions	2	-	-	2	-	-	-	-	-	-	-	-	2	-
21E	Electronic Devices & Circuit Design	CO4	Understand the Op-Amp filters and Oscillator circuit functions		_												
				2			2	_	_	_	_	_	_	_		2	
_	ysis	CO1	Understand basic concepts related to Signal Processing System	-	-	-	-	-	1	-	-	-		-	-	-	-
20	nal. 1 ica ins	CO2	Ability to Analyze the Signal Processing Algorithms	-	-	-	-	-		-	-	-	-	-	1	-	-
21EL3201	nal Analy and nmunicat Systems	CO3	Ability to Analyze the Filter design Methodologies	-	-	-	-	-	1	i	-	-	-	-	-	-	-
21]	Signal Analysis and Communication Systems	CO4	Ability to Analyze Signal Processing algorithms in different case studies	-	-	-	-	-	1	ı	-	-	-	-	-	-	-
		CO1	Understand the OS structure and its functions. Articulate design trade-offs inherent in OS design.	-	-	-	2	-	-	-	-	-	-	-	-	2	-
2101	Operating Systems	CO2	understanding of the role of process concepts on scheduling, scheduling algorithms, inter-process communication and system calls.	-	-	-	1	-	1	1	1	-	1	1	1	1	-
21EL22101	erating	CO3	Understand the concept of memory virtualization, page replacement algorithms, and deadlock	-	-	-	2	-	-	ı	-	-	-	-	-	2	-
	Ope	CO4	Understand file system Implementation	-	-	-	1	-	-	-	-	-	-	1	1	1	-
		CO5	Develop application programs using different platforms and languages.	-	-	-	-	1	-	-	-	-	-	-	-	3	-
	ign	CO1	Understand the architecture and programming concepts of 8086 Microprocessor	-	-	-	-	2	-	1	1	-	-	ı	-	2	-
	Des	CO2	Apply the Programming concepts of 8051 Microcontroller	-	-	-	-	2	-	-	-	-	-	1	1	2	-
21EL2202	Embedded Systems Design	CO3	Analyse the Interfacing of Peripherals to the 8051 microcontrollers through programming. Understand the basic architectures of PIC and ARM 7 microcontrollers	-	-	-	-	1	1	-	-	-	-	1	-	2	-
21E	pappa	CO4	Understand the basic concepts of CORTEX STM-32 microcontroller and RTOS	1	-	-	-	2	-	1	1	-	-	ı	-	3	-
	Embo	CO5	Analyze the applications of programming with 8051 and 8086 on hardware / software. Analyze the applications of programming with Arduino	ı	-	-	-	3	ı	ı	ı	-	-	ı	-	3	-
	stems	CO1	Illustrate the functional components of DBMS and Design an ER Model for a database.	-	-	-	-	2	1	ı	ı	-	-	1	1	2	-
33	ent Sy	CO2	Design a relational model for a database & Implement SQL concepts and relational algebra.	-	-	-	-	1	-	-	-	-	-	-	-	1	-
21EL2203	nagem	CO3	Implement PL/SQL programs, normalization techniques, indexing to construct and access database	-	1	-	-	2	-	-	-	-	-	-	-	2	-
211	atabase Management Systems	CO4	Analyze the importance of transaction Processing, concurrency control and recovery techniques.	-	1	-	-	2	-	-	-	-	-	-	-	2	-
	atabas	CO5	Design a database and implement SQL queries and PL/SQL programs to do various operations on data.	-		-	-		-	-	-	-	-	-	-	2	-

	Ω	CO6	Design and query database using database programming skills	_	2	T -	-	2	-	-	-	-	-	-	-	2	-
		CO1	Understand the MOS theory and processing technology	1	-	-	2		-	-	-	-	-	-	-	1	-
01	sign	CO2	Understand the MOS circuit characterization and				_										
L31	De		performance estimation	1	-	-	2		-	-	-	-	-	-	-	1	-
21EL3101	VLSI Design	CO3	Understand the combinational circuit design	1	-	-	2	1	-	-	-	-	-	-	-	1	-
,	>	CO4	Understand the sequential circuit design	1	-	-	2	1	-	-	-	-	-	-	-	1	1
		CO1	Create Static Web pages using basic HTML & apply CSS	-	1	-	-	2	-	-	-	-	-	-	-	2	-
	_	CO2	Apply JavaScript features for form validations and event handling	-	1	-	-	1	-	-	-	-	-	-	-	2	-
21EL2204	Web application Development	CO3	Create databases using MYSQL and apply JDBC concepts to connect to a database	-	3	-	-	2	-	ı	-	-	-	-	-		2
EL2	appl	CO4	Create dynamic web pages using servlets & JSP	-	2	-	-	3	-	-	-	-	-	-	-		3
211	Web a	CO5	Design WEB pages considering the user interface, navigation, and interaction with the database	-	2	-	-	2	-	ı	-	-	-	-	-		2
		CO6	Create Web Applications for real-time problems by providing UI and database accessibility.	-	2	-	-	2	-	1	-	-	-	-	1		2
		CO1	Understand Data Science, Exploratory Data Analysis, Data Extraction, Wrangling, Examine the inference from Exploratory data analysis (EDA)	1	-	1	-	2	-	-	-	-	-	-	-	2	-
02	suce	CO2	Demonstrate by organizing, comparing visualization and simple metrics	-	-	1	-	1	-	-	-	-	-	-	-	1	-
21EL3102	Data Science	CO3	Demonstrate by organizing comparing visualization and simple metrics	-	-	1	2	-	-	-	-	-	-	-	-	2	-
2	Da	CO4	Applying Variance, covariance, and correlation on Data Science	-	-	1	2		-	-	-	-	-	-	-	2	_
		CO5	Implementing Inferential Statistical Analysis	-	-	-	-	2	-	-	-	-	-	-	-	1	-
		CO6	Design & Development of various AI & ML Algorithms on Real-Time Applications	-	-	-	-	1	-	-	-	-	-	-	-	2	ı
	ಫ	CO1	Develop application programs using different platforms and languages.	2	-	-	-	-	-	-	-	-	-	-	-	-	1
21EL3103	Software	CO2	Apply Requirement modelling and design issues that are used in software development	-	1	-	-	-	-	-	-	-	-	-	-	-	2
21E	Sor	CO3	Analyze dynamic modelling issues which are used in software development	2	-	-	-	-	-	-	-	-	-	-	-	-	1
		CO4	Analyze various testing and CMMI techniques	1	-	-	-	-	-	-	-	-	-	-	-	-	2
	nce	CO1	Understand the problem, well defined problems and their solutions, Uninformed and Informed search.	2	-	-	-	-	-	1	-	-	-	-	-	1	-
104	tellige	CO2	Game playing with adversarial search. Constraint satisfaction problems	-	1	-	-		-	-	-	-	-	-	-	1	-
21EL3104	Artificial Intelligence	CO3	Building Knowledge and reasoning: - propositional logics, first order logic, forward and backward reasoning, resolution.	-	1	-	-	-	-	-	-	-	-	-	-	1	-
(4	Artific	CO4	Analyzing uncertainty using Bayes theorem, Hidden Markov model and Kalman filters.	-		-	-	-	-	-	-	-	-	-	-		-
	,	CO5	Solving AI problems.	-	2	-	-		-	-	-	-	-	-	-	2	-
	gun	CO1	Understand Machine learning and apply decision tree model for a real-world problem	2	-	-	-		-	-	-	-	-	-	-	-	1

1	I 👨		T		1								1				
202	earı	CO2	Distinguish linear regression and logistic regression and identify best	-		_	_	_	-	-	_	_	-	_	-	-	2
T.3.	e L	601	regression coefficients		1												2
21EL3202	Machine Learr	CO3	Analyze Bayesian model sand genetic programming model	-	1	-	-	-	-	-	-	-	-	-	-	-	I
, ,	Лас	CO4	Interpret the neural network learning and evaluate the model	-		-	-	-	-	-	-	-	-	-	-	-	
		CO5	Implement Machine Leaning models, evaluate and interpret the result	-	1	-	-	-	-	-	-	-	-	-	-	-	1
	æ	CO1	Introduction to Computer networks and Data Link Layer	1	1	-	-	-	-	-	-	-	-	-	-	1	-
0	Data Networks & Protocols	CO2	Network layer and Internetworking	1	2			2	-	-	-	-	-	-	-	2	_
221	wor	CO3	Transport layer, Session Layer, Presentation Layer and Application														
21EC2210	a Network Protocols		Layer	1	2	-	-	2	-	-	-	-	-	-	-	2	-
21	tta ] P.	CO4	Advanced Topics: Cryptography, Advancements in Application layer,														
	Ω̈́		Wireless LANs, Network Security	1	1	-	-		-	-	-	-	-	-	-	1	-
	E,	CO1	Understand Formal Language and Regular Expressions	_	1	_	_	_	_	_	_	_	_	_	_	1	_
03	Automata & Compiler Design	CO2	Apply Context Free grammars and parsing	_	1	_	-	_	_	-	_	-	_	_	_	1	_
.32	nat er D	CO3	Understand Semantics	_	2	_	_	_	_		_	_	_	_		1	_
21EL3203	Automata empiler De	CO4	Understand symbol table	_	2		_	_			_	_	_			2	_
2	A	CO5	Implement Code generation	_	2		_	_	_	_	_	_	_			1	
		CO1	Able to understand and remember the concepts of Perception, Back			-	-	_			_	-	-	-	_	1	-
		COI	Propagation, PCA, Singular Value Decomposition	2		-	-	-	-	-	-	-	-	-	-	-	2
		CO2	Able to understand auto encoders- and apply Regularization, Denoising,														
			Sparse, Contractive, Vectoral Representations of words Convolutional						_								
			Neural Networks, LeNet, , VGGNet, GoogleNet, ResNet, Fast RCNN, Faster	_		_	_	_	-	-	_	_	_	-	-	-	
	g		RCNN, YOLO		2												1
204	i i i i	CO3	Apply Long Short-Term Memory (LSTM) Restricted Boltzmann Machines,														
IL3:	Lez		Deep Dream, GRU, Neural style transfer, Deep learning for computer vision, text and sequences.	-	2	-	-	-	-	-	-	-	-	-	-	-	1
21EL3204	Deep Learning	CO4	Build Markov models, Markov networks, Markov chains, Variational														1
	Ď	004	autoencoders, Autoregressive Models: NADE, MADE, PixelRNN,														
			Generative Adversarial Networks (GANs), how to train DCGAN, limitations	-		-	-	-	-	-	-	-	-	-	-	-	-
			of deep learning		1												
		CO5	Implement basic Neural Networks, optimization algorithms, engine vector														
			decomposition, various types of auto encoders, batch normalization,	-	_	-	-	-	-	-	-	-	-	-	-	-	2
	50	CO1	convolutional neural networks Understanding the fundamental concepts like Flow control and conditions,		2												2
	sing	COI	File handling, OOPs and Python modules. Understand Django Template		_							_					
	ng n		System	_	_	_	_	2	-	-	_	_	_	_	-	-	1
107	mi 1 Dj	CO2	Understand how to use models to store the data with admin.	-	_	-	-	3	-	_	-	-	-	-	-	-	1
21EL3104	Web Programming using Python and Django	CO3	Analyze Django Forms, creating view CBV in various applications	-	1	-	-	2	-	_	-	-	-	-	-	-	2
211	rog	CO4	Analyze Django serialization to handle session with middleware.	_	1	-	-	2	-		_	-	-	_	-	-	1
	b P Pytl	CO5	Evaluate various applications and deployment of application with Django					<del>-</del>									1
	We		11 1	-	-			3	-			-			_		1
	or .	CO 1	understand cloud computing services and models	-	-	-	-	2	-	-	-	-	-	-	-	-	2
	ng for er	CO 2	understand cloud computing virtualization concepts	-	-	-	-	1		-							1
•	C 0		•														

5	l ∵∃ ŏ	CO 2	A make aloud complete value company with complete (AWS) Cloud to utilize		l			l	1			l	1			I	
EL3205	Cloud Computii web Engine	CO 3	Apply cloud services using amazon web services (AWS) Cloud to utilize cloud resources.	-	-	-	-	-	2	_	-	-	-	-	-	-	2
E	Con	CO 4	Apply the techniques how to create and deploy web applications using														
211	nd C		amazon web services (AWS) Cloud	-	-	-	-	2	-	-	-	-	-	-	-	-	2
	lo j	CO 5	Analyze various cloud services in amazon web services (AWS) and create													_	
	_		each service.		2			_				_					2
	for	CO 1	Ability to find and transmit data emanated from different embedded and IoT	_	_	_		_	-	_	-	_	-	_	-	-	2
,,	ics	CO 2	devices Ability to use HADOOP and MAP reduce tools in the process of				-	2									2
700	alyt gine	CO 2	undertaking Analytics	-	-	-	-	2	-	-	-	-	-	-	-	-	1
21EL3206	Big data Analytics for Web Engineer	CO 3	Ability to develop data Modelling, Structuring, and Analytics using "R"														1
211	ata /eb	003	Language	-	-	-	-	2	-	-	-	-	-	-	-	-	2
	P 8	CO 4	Ability to conduct various kinds of analytics on big data especially using text														
	B			-	-	-	-	2	-	-	-	-	-	-	-	-	2
	gy gy	CO 1	Understand the types, benefits, and limitations of blockchain.	-	-	-	-	1	-	-	-	-	-	-	-	-	1
<u> </u>	Blo	CO 2															
320	of		Explore the blockchain decentralization and cryptography concepts	-	-	-	-	2	-	-	-	-	-	-	-	-	2
21EL3207	Essentials of Block Chain Technology	CO 3	Enumerate the Bitcoin features and their alternative options	-	-	-	-	1	-	-	-	-		-	-	-	1
21	sent	CO 4	Apply the smart contracts on the Ethereum Platform	-	-	-	-	2	-	-	-	-	-	1	-	-	1
	Ess Ch	CO 5	Analyse DApps on different frame works	-	-	-	-		-	-	-	-	-	-	-	-	1
		CO 1	Understand the RPA Foundations and RPA Skills.	2	-	-	-	-	-	-	-	-	-	-	-	-	2
	SS	CO 2	Understand the Process Methodologies and Requirements for RPA														
80	oce ion		Environment Planning.	1	-	-	-	-	-	-	-	-	-	-	-	-	2
32	c Pı mat	CO 3	Understand the Process and Methodology of BOT Development.	1	1	2	-	-	-	-	-	-	-	-		-	1
21EL3208	Robotic Process Automation	CO 4	Understand the Deployment, Monitoring and Data Preparation		_			_				_				_	
7	Roł A		Methodologies			2	2										1
		CO 5	Implementation of BOT Development Process and Verification using the	1	1	2	1	-	-		-	-	-	-	-	-	2
		CO1	RPA Tools [UI Path]. Understand various Hardware/Software Co-Design, models	1	-		1	_								1	
	00 6	CO2	Understand different methodologies involved in Hardware/Software Co-	1	-	-	-	-	-	-	-	-	-	-	-	1	-
	vare	CO2	Design	-	2	-	-	-	-	-	-	-	-	-	-	1	-
21EL3211	oftv gn	CO3	Understand various interfacing techniques involved in Hardware/Software													-	
E	are soft design		Co-Design.	-	1	-	-	-	-	-	-	-	-	-	-	2	-
21.	Hardware software design	CO4	Understand various target architectures involved in Hardware/Software Co-					_				_					
	lard		Design.	-	2	-	_	-	-	-	-	-	-		,	1	-
	五	CO5	Analyze the High-Level synthesis model and RTL optimization	-	1	-	-	-	-	-	-	-		-	-	1	-
	96	CO1	Current Trends for Embedded Systems	-	-	-	-	-	-	-	-	-	1	-	-	2	-
	Ti.	CO2	Challenges in validating timing constraints in priority –driven														
303	eal		systems Off-line versus On-line Scheduling	-	-	-	-	-	-	-	-	2		-	-	2	-
21EL3203	Embedded Real Time Operating System	CO3	Pros and Cons of Clock Driven Scheduling.	-	-	-	-	_	-	-	-	2		-	-	2	-
	dde rati	CO4	Deferrable Servers	-	-	-	-	-	-	-	-	-	2	-	-	1	-
	лье,	CO5	Real-Time Operating Systems Other Basic Operating System										_			-	
	En	-	Functions	-	-	-	-	-	-	-	-	-	2	-	-	1	-
			1 uncuons													1	

CO2   Apply concepts of IZC and USB communication to develop the application   1		lded	CO1 Under RS485	estand concepts of serial communication protocols RS232	, -	2	-	-	1	-	-	-	-	-	-	-	-	1
COJ   Able to understand the system protection strategies   COJ   Able to understand the requirements for processor selection strategies   COJ   Able to understand the requirements for memory selection strategies   COJ   Able to understand the requirements for memory selection strategies   COJ   Able to understand the requirements for memory selection strategies   COJ   Able to understand the bus architectures and interconnect architectures and analyze the different case studies   COJ   Able to understand the bus architecture and interconnect architectures and analyze the different case studies   COJ   Understand security trends and policies   COJ   Understand security trends and policies   COJ   Understand embedded operating system security techniques   COJ   Understand cryptography techniques   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and functioning of loT devices   COJ   Understand functional blocks and funct	\$204	fEmber	CO2 Apply	concepts of I2C and USB communication to develop the	-	1	-	-	2	-	-	-	-	-	-	-	-	2
COJ   Able to understand the system protectors and developments   1   -   -   -   -   -   -   -   -   -	ELS	ig o	11		<b>-</b>	1	_	_		-	-	_	-	_	-	_	_	2
COI   Able to understand the system protection strategies.   2     3	217	rkir S			,													_
COJ   Able to understand the system protectors and developments   1   -   -   -   -   -   -   -   -   -		two			1 -	2	-	-	3	-	-	-	-	-	-	-	-	1
CO1   Able to understand the system architecture concepts   1   -   -   -   -   -     3		Ne			_		_	_		_		_	_	_	_	_	_	2
CO2   Able to understand the requirements for processor selection strategies.   - 2     - 2					1		_	_		_		_	_	_	_	_	3	-
Able to understand the requirements for processor selection strategies.   - 2     2			CO2	•	1													
CO5   Able to understand the System Architecture Implementation & Verification   1		hip.	Able to	o understand the requirements for processor selection strategies.	-	2	-	-	-	-	-	-	-	-	-	-	2	-
CO5   Able to understand the System Architecture Implementation & Verification   1   2     2	1103	n C	CO3 Able to	o understand the requirements for memory selection strategies for SoC														
CO5   Able to understand the System Architecture Implementation & Verification   1	EL4	В			_	1	_	_	_	_			-	_	-	_	1	-
CO5   Able to understand the System Architecture Implementation & Verification   1	211	/ste			_	2	_	_	_	_	-	-	_	-	-	-	2	_
CO1   understand security trends and policies   1   -   -   -   -   -   -   -   -   -		Š	analyze	e the different case studies		2												
CO1   understand security trends and policies   1     2			CO5 Able to	o understand the System Architecture Implementation & Verification	1	2	-	-	-	-	-	-	-	-	-	-	2	-
CO2   understand embedded operating system security techniques   - 2 2		>		tand security trends and policies	1		_	_	_	_		_	_	_	_	_		_
CO1   Understand functional blocks and functioning of IoT devices   CO2   Understand functional blocks and functioning of IoT devices   CO3   Understand Communication models that are used for the development of the loT based Systems   CO3   Understand different networking topologies and protocols used for the development of IoT based Networks   CO4   IoT Application Case studies   CO5   To Understand the Architectural Overview of IoT   CO5   To Understand the IoT Reference Architecture and Real World Design   CO5   To Apply the various IoT Protocols in Datalink and Network layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5		urit		• •	_	2	_	_	_			_	_	_	_	_		_
CO1   Understand functioning of IoT devices   2   1	20]	Secı	CO2															
CO1   Understand functioning of IoT devices   2   1	[4]	ed 8	unders	tand and describe software security developments and upgrades.	-	2	-	-	-	-	-	-	-	-	-	-	1	-
CO1   Understand functioning of IoT devices   2   1		edd	CO4 unders	tand cryptography techniques	-		-	-	-	-	-	-	-	-	-	-	1	-
CO1   Understand functional blocks and functioning of IoT devices   CO2   Understand functional blocks and functioning of IoT devices   CO3   Understand Communication models that are used for the development of the loT based Systems   CO3   Understand different networking topologies and protocols used for the development of IoT based Networks   CO4   IoT Application Case studies   CO5   To Understand the Architectural Overview of IoT   CO5   To Understand the IoT Reference Architecture and Real World Design   CO5   To Understand the IoT Reference Architecture and Real World Design   CO5   To Apply the various IoT Protocols in Datalink and Network layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5		dm	CO5 Demon	nstration of experiments on crypto algorithms and														
CO2   Understand Communication models that are used for the development of the loT based Systems   CO3   Understand different networking topologies and protocols used for the development of IoT based Networks   CO4   IoT Application Case studies   CO5   CO6   IoT Understand the Architectural Overview of IoT   CO7   CO7   To Understand the IoT Reference Architecture and Real World Design   CO7   CO		Щ			-	1	-	-	-	-	-	-	-	-	-	-	2	-
CO1   To Understand the Architectural Overview of IoT   CO2   To Understand the IoT Reference Architecture and Real World Design   Constraints   CO3   To Apply the various IoT Protocols in Datalink and Network layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO5   CO5   To Apply the various IoT Protocols in Transport and Session Layers   CO5		of	Onden			1	-	-	-	-	2	-	-	-	-	-	1	-
CO1   To Understand the Architectural Overview of IoT   CO2   To Understand the IoT Reference Architecture and Real World Design   Constraints   CO3   To Apply the various IoT Protocols in Datalink and Network layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO3   To Apply the various IoT Protocols in Transport and Session Layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO5	90	tals		1	-	-	_	_		-	_	-		_	1	-	_	_
CO1   To Understand the Architectural Overview of IoT   CO2   To Understand the IoT Reference Architecture and Real World Design   Constraints   CO3   To Apply the various IoT Protocols in Datalink and Network layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO3   To Apply the various IoT Protocols in Transport and Session Layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO5	L31	neni oT							3									
CO1   To Understand the Architectural Overview of IoT   CO2   To Understand the IoT Reference Architecture and Real World Design   Constraints   CO3   To Apply the various IoT Protocols in Datalink and Network layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO3   To Apply the various IoT Protocols in Transport and Session Layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO5	1E	dan									2						1	-
CO1   To Understand the Architectural Overview of IoT   CO2   To Understand the IoT Reference Architecture and Real World Design   Constraints   CO3   To Apply the various IoT Protocols in Datalink and Network layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO3   To Apply the various IoT Protocols in Transport and Session Layers   CO4   To Apply the various IoT Protocols in Transport and Session Layers   CO5		Fun			-	-	-	-			1	-	-	-		-	2	
CO2 To Understand the IoT Reference Architecture and Real World Design Constraints  CO3 To Apply the various IoT Protocols in Datalink and Network layers  CO4 To Apply the various IoT Protocols in Transport and Session Layers  CO5 To Understand the IoT Reference Architecture and Real World Design Constraints  CO6 To Apply the various IoT Protocols in Datalink and Network layers  CO7 To Apply the various IoT Protocols in Transport and Session Layers  CO8 To Apply the various IoT Protocols in Transport and Session Layers  CO9 To Apply the various IoT Protocols in Transport and Session Layers					-		-	-			2	-		-			1	-
		uing res res				-	-	-	-	-		-	-	-	-		1	-
	310	f Th		E	-	-	-	-	-	-	1	-	-	-	-	-	1	-
	ELS	et o hite Pro			_	-	_	-	-	-	2	-	-	-	-	-	1	_
	21	Arc	CO4															
CO1 Understand the role of sensors and actuators in real-time aspects and Electrostatic transducers.  CO2 Understand the role of Magnetic, Piezoelectric, Resistive and Optical  CO3 Understand the role of Magnetic, Piezoelectric, Resistive and Optical		Int	То Ард	ply the various IoT Protocols in Transport and Session Layers	-	-	-	-	-	-	2	-	-	-	-	-	1	-
Electrostatic transducers.  CO2 Understand the role of Magnetic, Piezoelectric, Resistive and Optical  The standard of the role of Magnetic of Magnetic, Piezoelectric of Magnetic of Magn		gu	CO1 Under	estand the role of sensors and actuators in real-time aspects and	i													
CO2 Understand the role of Magnetic, Piezoelectric, Resistive and Optical		uati			-	2	-	-	1	-	-	-	-	-	-	-	2	-
	∞	Act	CO2 Under	stand the role of Magnetic, Piezoelectric, Resistive and Optica	1													
물 등   무용	310	nd ,			-	2	-	-		1	-	-	-	-	-	-	2	-
Transducers.  CO3 Apply the role of biosensors and Data Acquisition Systems.  CO3 Apply the role of biosensors and Data Acquisition Systems.  CO3 Apply the role of biosensors and Data Acquisition Systems.	E	ng a Devi	CO3 Apply	the role of biosensors and Data Acquisition Systems.	-	1	-	-	-		2	-	-	-	-	-	1	-

2	Sensi	CO4	Analyze the role of different Energy sources and power management in IoT	-	2	-	-	-	-	-	-	-	-	-	-	2	-
	[o]	CO5	Implement and Evaluate the Practical -IoT	-	1	-	-	-	-	-	1	-	-	-	-	1	-
	<b>:</b>	CO1	Understand the concepts of Wireless sensor networks, challenges, and limitations of wireless sensor networks	-	-	-	-	2	1	1	1	1	-	-	1	1	-
3209	senso	CO2	Understand the MAC layer protocol for energy-efficient design of WSN	-	-	-	-	-	1	3	1	-	-	ı	-	2	1
E	less	CO3	Analyze the data dissemination and gateway concepts in WSN	-	-	-	2	-			-	-	-	-	1	1	1
21	wire	CO4	Understanding the concept of time synchronization, Localization, and positioning in WSN	-	-	-	-	-	1	1	1	1	-	-	1	2	-
		CO5	Development of different applications using WSN concepts	-	-	-		2	-	-	-	-	-	-	1	2	1
0	uting	CO1	To understand the differences between traditional deployment and cloud computing	-	-	-	-	-	-	2	1	-	-	-	-	1	1
EL321	comp or IoT	CO2	Understand different cloud infrastructures and service models and virtualization	-	-	-	-	-	-		2	-	-	-	-	1	
21]	buo	CO3	Apply the concept of Data Analytics by using AWS cloud	-	-	-	-	-	-	2		-	-	-	-	2	-
	Ü	CO4	Analyze the statistical data analysis and methods for evaluation	-	-	-	-	-	-	·	2	-	-	-	-	2	-

**NoTe:** (3)H – High Correlation, M (2)– Medium Correlation, L(1) – Low Correlation