

21MT2102	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	-	
		CO2	Demonstrate the Fourier series and Laplace transforms.	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO3	Describe probability , Random Variables	1	-	-	-	-	-	-	-	-	-	-	-	-	3	-
		CO4	Explain complex variables, analytic functions and introduction to stochastic process and Algebraic structures.	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
21MT3101	Probability and Statistics	CO1	understand the terminologies of basic probability, two types of random variables and their probability functions	2	2	-	-	-	-	-	-	-	-	-	-	2	-	
		CO2	observe and analyze the behavior of various discrete and continuous probability distributions		1	1	-	-	-	-	-	-	-	-	-	1	-	
		CO3	understand the central tendency, correlation and correlation coefficient and also regression	1	1	-	-	-	-	-	-	-	-	-	-	1	-	
		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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO5	Implement probability and statistics using R language	1	1	-	-	-	-	-	-	-	-	-	-	1	-	
21UC1203	Design Thinking and Innovation	CO1	Understand the importance of Design thinking process for contextualized problems	-	1	-	-	2	-	-	-	-	-	-	-	-	1	
		CO2	Analyze, define, and ideate for solutions	-	-	1	-	-	-	2	-	-	-	-	-	-	2	
		CO3	Develop and test the prototype made	-	-	-	-	1	-	3	-	-	-	-	-	-	2	
		CO4	Explore the fundamentals of entrepreneurship skills for transforming the challenge into an opportunity	-	-	-	-	2	-	-	3	-	-	-	-	-	1	
21PH1101	Science Elective - I (SemiConduct or Physics)	CO1	Understand semiconductor in terms of its electrical and optical properties	2	2	-	-	-	-	-	-	-	-	-	-	1		
		CO2	Understand junction properties of semiconductor device.	1	1	-	-	-	-	-	-	-	-	-	-	1		
		CO3	Understand the characteristics of devices like BJT, FET		1	1	-	-	-	-	-	-	-	-	-	1		
		CO4	Understand the applications of photonic devices.		2	2	-	-	-	-	-	-	-	-	-	2		
21CY1001	Science Elective - 2(Engineering Chemistry)	CO1	Predict potential complications from combining various chemicals or metals in an engineering setting	2	-	2	-	-	-	1	-	-	-	-	-	1		
		CO2	Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena	2	-	2					-	-	-	-	-	1		
		CO3	Examine water quality and select appropriate purification technique for intended problem	1	-	-	-	-	-	1	-	-	-	-	-	1		
		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	-	-	-	-	-	2		
		CO5	An ability to analyze and generate experimental skills	1	-	-	2	-	-	-	-	-	-	-	-	1		
	skills-I	CO1	Apply the concepts of mathematical principles besides logic and identifying certain basic mathematical formulae to solve these kinds of problems	-	-	-	-	-	-	-	-	-	-	1	-	-		

21EL3202	Machine Learn	CO2	Distinguish linear regression and logistic regression and identify best regression coefficients	-	1	-	-	-	-	-	-	-	-	-	-	2	
		CO3	Analyze Bayesian model sand genetic programming model	-	1	-	-	-	-	-	-	-	-	-	-	-	1
		CO4	Interpret the neural network learning and evaluate the model	-		-	-	-	-	-	-	-	-	-	-	-	
		CO5	Implement Machine Learning models , evaluate and interpret the result	-	1	-	-	-	-	-	-	-	-	-	-	-	1
21EC2210	Data Networks & Protocols	CO1	Introduction to Computer networks and Data Link Layer	1	1	-	-	-	-	-	-	-	-	-	-	1	-
		CO2	Network layer and Internetworking	1	2			2	-	-	-	-	-	-	-	2	-
		CO3	Transport layer, Session Layer, Presentation Layer and Application Layer	1	2	-	-	2	-	-	-	-	-	-	-	2	-
		CO4	Advanced Topics: Cryptography, Advancements in Application layer, Wireless LANs, Network Security	1	1	-	-		-	-	-	-	-	-	-	1	-
21EL3203	Automata & Compiler Design	CO1	Understand Formal Language and Regular Expressions	-	1	-	-	-	-	-	-	-	-	-	-	1	-
		CO2	Apply Context Free grammars and parsing	-	1	-	-	-	-	-	-	-	-	-	-	1	-
		CO3	Understand Semantics	-	2	-	-	-	-	-	-	-	-	-	-	1	-
		CO4	Understand symbol table	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO5	Implement Code generation	-	2	-	-	-	-	-	-	-	-	-	-	1	-
21EL3204	Deep Learning	CO1	Able to understand and remember the concepts of Perception, Back 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 RCNN, YOLO	-	2	-	-	-	-	-	-	-	-	-	-	-	1
		CO3	Apply Long Short-Term Memory (LSTM) Restricted Boltzmann Machines, Deep Dream, GRU, Neural style transfer, Deep learning for computer vision, text and sequences.	-	2	-	-	-	-	-	-	-	-	-	-	-	1
		CO4	Build Markov models, Markov networks, Markov chains, Variational 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, convolutional neural networks	-	2	-	-	-	-	-	-	-	-	-	-	-	2
21EL3104	Web Programming using Python and Django	CO1	Understanding the fundamental concepts like Flow control and conditions, File handling, OOPs and Python modules. Understand Django Template System	-	-	-	-	2	-	-	-	-	-	-	-	-	1
		CO2	Understand how to use models to store the data with admin.	-	-	-	-	3	-	-	-	-	-	-	-	-	1
		CO3	Analyze Django Forms, creating view CBV in various applications	-	1	-	-	2	-	-	-	-	-	-	-	-	2
		CO4	Analyze Django serialization to handle session with middleware.	-	1	-	-	2	-	-	-	-	-	-	-	-	1
		CO5	Evaluate various applications and deployment of application with Django	-	-	-	-	3	-	-	-	-	-	-	-	-	1
ng for er		CO 1	understand cloud computing services and models	-	-	-	-	2	-	-	-	-	-	-	-	2	
		CO 2	understand cloud computing virtualization concepts	-	-	-	-	1		-						1	

21EL3205	Cloud Computing web Engineer	CO 3	Apply cloud services using amazon web services (AWS) Cloud to utilize cloud resources.	-	-	-	-	-	2	-	-	-	-	-	-	2	
		CO 4	Apply the techniques how to create and deploy web applications using amazon web services (AWS) Cloud	-	-	-	-	2	-	-	-	-	-	-	-	-	2
		CO 5	Analyze various cloud services in amazon web services (AWS) and create each service.	-	2	-	-	-	-	-	-	-	-	-	-	-	2
21EL3206	Big data Analytics for Web Engineer	CO 1	Ability to find and transmit data emanated from different embedded and IoT devices	-	-	-	-	2	-	-	-	-	-	-	-	2	
		CO 2	Ability to use HADOOP and MAP reduce tools in the process of undertaking Analytics	-	-	-	-	2	-	-	-	-	-	-	-	1	
		CO 3	Ability to develop data Modelling, Structuring, and Analytics using “R” Language	-	-	-	-	2	-	-	-	-	-	-	-	2	
		CO 4	Ability to conduct various kinds of analytics on big data especially using text	-	-	-	-	2	-	-	-	-	-	-	-	2	
21EL3207	Essentials of Block Chain Technology	CO 1	Understand the types, benefits, and limitations of blockchain.	-	-	-	-	1	-	-	-	-	-	-	-	1	
		CO 2	Explore the blockchain decentralization and cryptography concepts	-	-	-	-	2	-	-	-	-	-	-	-	2	
		CO 3	Enumerate the Bitcoin features and their alternative options	-	-	-	-	1	-	-	-	-	-	-	-	1	
		CO 4	Apply the smart contracts on the Ethereum Platform	-	-	-	-	2	-	-	-	-	-	-	-	1	
		CO 5	Analyse DApps on different frame works	-	-	-	-	-	-	-	-	-	-	-	-	1	
21EL3208	Robotic Process Automation	CO 1	Understand the RPA Foundations and RPA Skills.	2	-	-	-	-	-	-	-	-	-	-	-	2	
		CO 2	Understand the Process Methodologies and Requirements for RPA Environment Planning.	1	-	-	-	-	-	-	-	-	-	-	-	2	
		CO 3	Understand the Process and Methodology of BOT Development.	1	1	2	-	-	-	-	-	-	-	-	-	1	
		CO 4	Understand the Deployment, Monitoring and Data Preparation Methodologies	-	-	2	2	-	-	-	-	-	-	-	-	1	
		CO 5	Implementation of BOT Development Process and Verification using the RPA Tools [UI Path].	1	1	2	1	-	-	-	-	-	-	-	-	2	
21EL3211	Hardware software co design	CO1	Understand various Hardware/Software Co-Design, models	1	-	-	-	-	-	-	-	-	-	-	1	-	
		CO2	Understand different methodologies involved in Hardware/Software Co-Design	-	2	-	-	-	-	-	-	-	-	-	1	-	
		CO3	Understand various interfacing techniques involved in Hardware/Software Co-Design.	-	1	-	-	-	-	-	-	-	-	-	2	-	
		CO4	Understand various target architectures involved in Hardware/Software Co-Design.	-	2	-	-	-	-	-	-	-	-	-	1	-	
		CO5	Analyze the High-Level synthesis model and RTL optimization	-	1	-	-	-	-	-	-	-	-	-	1	-	
21EL3203	Embedded Real Time Operating System	CO1	Current Trends for Embedded Systems	-	-	-	-	-	-	-	-	-	1	-	2	-	
		CO2	Challenges in validating timing constraints in priority –driven systems Off-line versus On-line Scheduling	-	-	-	-	-	-	-	-	2	-	-	2	-	
		CO3	Pros and Cons of Clock Driven Scheduling.	-	-	-	-	-	-	-	-	2	-	-	2	-	
		CO4	Deferrable Servers	-	-	-	-	-	-	-	-	-	2	-	-	1	-
		CO5	Real-Time Operating Systems Other Basic Operating System Functions	-	-	-	-	-	-	-	-	-	2	-	-	1	-

21EL3204	Networking of Embedded Systems	CO1	Understand concepts of serial communication protocols RS232, RS485, SPI	-	2	-	-	1	-	-	-	-	-	-	-	1	
		CO2	Apply concepts of I2C and USB communication to develop the application	-	1	-	-	2	-	-	-	-	-	-	-	-	2
		CO3	Apply concepts of CAN bus and develop an application	-	1	-	-	2	-	-	-	-	-	-	-	-	2
		CO4	Apply concepts of Ethernet and Wireless network and develop an application	-	2	-	-	3	-	-	-	-	-	-	-	-	1
		CO5	Analyze embedded system protocols and develop applications	-	2	-	-	2	-	-	-	-	-	-	-	-	2
21EL4103	System on Chip	CO1	Able to understand the system architecture concepts	1	-	-	-	-	-	-	-	-	-	-	-	3	-
		CO2	Able to understand the requirements for processor selection strategies.	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO3	Able to understand the requirements for memory selection strategies for SoC development.	-	1	-	-	-	-	-	-	-	-	-	-	1	-
		CO4	Able to understand the bus architectures and interconnect architectures and analyze the different case studies	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO5	Able to understand the System Architecture Implementation & Verification	1	2	-	-	-	-	-	-	-	-	-	-	2	-
21EL4104	Embedded Security	CO1	understand security trends and policies	1	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO2	understand embedded operating system security techniques	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO3	understand and describe software security developments and upgrades.	-	2	-	-	-	-	-	-	-	-	-	-	1	-
		CO4	understand cryptography techniques	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CO5	Demonstration of experiments on crypto algorithms and cryptanalysis in Embedded Systems.	-	1	-	-	-	-	-	-	-	-	-	-	2	-
21EL3106	Fundamentals of IoT	CO1	Understand functional blocks and functioning of IoT devices	-	-	-	-	-	-	2	-	-	-	-	-	1	-
		CO2	Understand Communication models that are used for the development of the IoT based Systems	-	-	-	-	3	-	-	-	-	-	-	-	-	-
		CO3	Understand different networking topologies and protocols used for the development of IoT based Networks	-	-	-	-	-	-	3	-	-	-	-	-	1	-
		CO4	IoT Application Case studies	-	-	-	-	-	-	1	-	-	-	-	-	2	-
21EL3107	Internet of Things : Architectures and Protocols	CO1	To Understand the Architectural Overview of IoT	-	-	-	-	-	-	2	-	-	-	-	-	1	-
		CO2	To Understand the IoT Reference Architecture and Real World Design Constraints	-	-	-	-	-	-	1	-	-	-	-	-	1	-
		CO3	To Apply the various IoT Protocols in Datalink and Network layers	-	-	-	-	-	-	2	-	-	-	-	-	1	-
		CO4	To Apply the various IoT Protocols in Transport and Session Layers	-	-	-	-	-	-	2	-	-	-	-	-	1	-
1EL3108	ng and Actuating Devices	CO1	Understand the role of sensors and actuators in real-time aspects and Electrostatic transducers.	-	2	-	-	1	-	-	-	-	-	-	2	-	
		CO2	Understand the role of Magnetic, Piezoelectric, Resistive and Optical Transducers.	-	2	-	-	-	1	-	-	-	-	-	2	-	
		CO3	Apply the role of biosensors and Data Acquisition Systems.	-	1	-	-	-	-	2	-	-	-	-	-	1	-

2	IoT Sensi	CO4	Analyze the role of different Energy sources and power management in IoT	-	2	-	-	-	-	-	-	-	-	-	-	2	-	
		CO5	Implement and Evaluate the Practical -IoT	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-
21EL3209	wireless sensor networks	CO1	Understand the concepts of Wireless sensor networks, challenges, and limitations of wireless sensor networks	-	-	-	-	2	-	-	-	-	-	-	-	1	-	
		CO2	Understand the MAC layer protocol for energy-efficient design of WSN	-	-	-	-	-	-	3	-	-	-	-	-	-	2	-
		CO3	Analyze the data dissemination and gateway concepts in WSN	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-
		CO4	Understanding the concept of time synchronization, Localization, and positioning in WSN	-	-	-	-	-	-	1	-	-	-	-	-	-	2	-
		CO5	Development of different applications using WSN concepts	-	-	-	-	2	-	-	-	-	-	-	-	-	2	-
21EL3210	Cloud computing for IoT	CO1	To understand the differences between traditional deployment and cloud computing	-	-	-	-	-	-	2	-	-	-	-	-	1	-	
		CO2	Understand different cloud infrastructures and service models and virtualization	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-
		CO3	Apply the concept of Data Analytics by using AWS cloud	-	-	-	-	-	-	2	-	-	-	-	-	-	2	-
		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