Koneru Lakshmaiah Education Foundation
(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)
❖ Approved by AICTE ❖ ISO 21001:2018 Certified
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Department of Electronics and Communication Engineering
Program: M.Tech.– Radar & Communications
Academic Year 2024–2025

Course Code	Course Name	CO No	CO Description
24EC 5101	Modern Digital and Wireless Communication	CO1	Understand and analyze digital communication system models and performance metrics.
		CO2	Design wireless communication links considering channel effects and noise.
		CO3	Apply equalization and coding techniques to mitigate ISI and errors.
		CO4	Evaluate transceiver architectures for modern wireless systems.
24EC 5102	Microwave and Millimetric Wave Circuits	CO1	Explain microwave circuit theory and transmission line behavior at high frequencies.
		CO2	Design microwave resonators and filters for specific applications.
		CO3	Analyze waveguide and millimeter-wave circuit characteristics.
		CO4	Develop microwave components using practical design constraints.
24EC 5103	Radar Engineering & MM Radar	CO1	Explain basic radar principles and system architectures.
		CO2	Analyze radar wave propagation and target detection methods.
		CO3	Design radar signal processing stages for range, Doppler, and angle estimation.
		CO4	Apply radar concepts to remote sensing and mm-wave radar systems.
24EC 5104	RF System and Antenna Design	CO1	Understand RF system architecture and building blocks.
		CO2	Design RF amplifiers, oscillators, and matching networks.
		CO3	Analyze antenna parameters and radiation characteristics.
		CO4	Develop antenna and RF front-end systems for wireless applications.
24EC 51A1	EMI & EMC	CO1	Explain the sources and effects of electromagnetic interference.
		CO2	Apply shielding and grounding techniques to reduce EMI.

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		CO3	Analyze EMI using mathematical and simulation models.
		CO4	Design EMI/EMC compliant electronic systems.
24EC 51A2	Microwave Semiconductor Devices	CO1	Understand the operation of microwave semiconductor devices.
		CO2	Analyze high-frequency characteristics of diodes and transistors.
		CO3	Design microwave circuits using active devices.
		CO4	Evaluate performance of high-frequency components.
24EC 51A3	Smart Antennas	CO1	Explain smart antenna concepts and array configurations.
		CO2	Apply DOA estimation algorithms for signal direction finding.
		CO3	Implement adaptive beamforming techniques.
		CO4	Analyze performance of smart antenna systems in wireless networks.
24EC 51A4	Embedded Systems & VLSI for Wireless Communication	CO1	Understand embedded system architecture for communication systems.
		CO2	Design VLSI blocks for RF transceivers.
		CO3	Implement SDR-based wireless communication systems.
		CO4	Evaluate power, area, and speed trade-offs in VLSI design.
24EC 51B1	Phased Array Systems	CO1	Understand phased array antenna principles and scanning techniques.
		CO2	Analyze feed network and phase shifter designs.
		CO3	Design frequency and electronically scanned arrays.
		CO4	Evaluate beam steering and sidelobe control methods.
24EC 51B2	GPS & Global Satellite Systems	CO1	Understand GPS signal structure and satellite orbits.
		CO2	Analyze GPS errors and clock synchronization issues.

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		CO3	Apply positioning and navigation algorithms.
		CO4	Evaluate performance of different satellite navigation systems.
24EC 51B3	Next Generation Networking & Communication Technologies	CO1	Explain modern wireless networking technologies and architectures.
		CO2	Analyze GPRS, LTE and 4G protocols.
		CO3	Design communication networks with QoS considerations.
		CO4	Evaluate performance of next-gen wireless networks.
24EC 51B4	Deep Learning with Artificial Intelligence	CO1	Understand fundamentals of AI and deep learning.
		CO2	Implement CNN and RNN models for signal processing problems.
		CO3	Apply deep learning in communication and radar systems.
		CO4	Evaluate performance of AI models using standard metrics.
24EC 5205	4G, 5G and Modern Wireless Technologies	CO1	Explain 4G and 5G system architectures and protocols.
		CO2	Analyze propagation models and capacity limits.
		CO3	Design cellular communication systems.
		CO4	Evaluate performance of modern wireless standards.
24EC 5206	Advanced Communication Systems & Networks	CO1	Understand advanced wireless communication concepts.
		CO2	Analyze spectrum sharing and MU-MIMO techniques.
		CO3	Apply cryptography and security in communication systems.
		CO4	Design next-generation wireless networks.
24EC 5207	Modern Radar Systems & Autonomous Vehicles	CO1	Explain MIMO radar and automotive radar principles.
		CO2	Analyze radar signal processing for autonomous vehicles.
		CO3	Design radar-based sensing for vehicle

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			applications.
		CO4	Evaluate performance of automotive radar systems.
24EC 5208	Optical Networks & Satellite Communications	CO1	Understand satellite communication system design.
		CO2	Explain optical fiber components and WDM systems.
		CO3	Design optical and satellite communication links.
		CO4	Evaluate network performance and link budgets.
24EC 52C1	Estimation & Detection Theory	CO1	Understand detection and estimation theory fundamentals.
		CO2	Apply estimation techniques such as MMSE and ML.
		CO3	Implement Kalman filtering for dynamic systems.
		CO4	Analyze receiver performance in noisy environments.
24EC 52C2	Radar Signal Processing & System	CO1	Understand radar equations and system components.
		CO2	Analyze clutter and noise effects in radar systems.
		CO3	Implement signal processing for target detection.
		CO4	Design phased array radar systems.
24EC 52C3	High-Performance Communication Networking	CO1	Explain high-speed communication network architectures.
		CO2	Analyze TCP/IP and optical networking technologies.
		CO3	Apply security mechanisms in networking.
		CO4	Evaluate performance of packet-switched networks.
24EC 52C4	Cryptography & Networking Security	CO1	Explain principles of cryptography and security protocols.
		CO2	Implement encryption and decryption algorithms.
		CO3	Analyze security vulnerabilities in

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			networks.
		CO4	Design secure communication systems.
24EC 52D1	Machine Learning & Soft Computing in Communication	CO1	Understand ML and soft computing techniques.
		CO2	Apply ML for wireless and radar applications.
		CO3	Implement deep learning models for communication systems.
		CO4	Evaluate ML model performance in real-world scenarios.
24EC 52D2	Remote Sensing & Sensors	CO1	Understand remote sensing principles and sensor technologies.
		CO2	Analyze satellite and airborne sensor data.
		CO3	Apply data processing techniques for remote sensing images.
		CO4	Evaluate sensor system performance.
24EC 52D4	Automotive Electronics & Avionics	CO1	Explain automotive electronic systems and sensors.
		CO2	Analyze control systems used in vehicles and avionics.
		CO3	Design autonomous vehicle electronic systems.
		CO4	Evaluate avionics system performance and safety.
24IE 5149	Seminar	CO1	Develop effective technical presentation skills.
		CO2	Improve scientific communication and delivery methods.
		CO3	Demonstrate audience engagement techniques.
		CO4	Analyze technical topics and present them clearly.
24IE 5250	Term Paper	CO1	Identify and define research problems.
		CO2	Conduct literature survey and technical analysis.
		CO3	Develop and document research findings.
		CO4	Present research work in a structured format.

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24TS 5101	Technical Skilling-I	CO1	Understand system modeling and visualization tools.
		CO2	Apply system design techniques for engineering problems.
		CO3	Develop simulation models for scientific concepts.
		CO4	Present design solutions using visualization methods.
24TS 5102	Technical Skilling-II	CO1	Apply advanced system design methods.
		CO2	Develop and analyze engineering algorithms.
		CO3	Use advanced visualization tools for system design.
		CO4	Evaluate system performance and optimization techniques.

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