Meerut Institute of Engineering and Technology, Meerut
Department of ECE

Course Outcome and CO-PO Mapping for M.Tech -ECE

MTEC 101: Advanced Engineering Mathematics					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1 On completion of this course, the student will be able to apply the concepts of linear algebra (K3 level)			**2**	**2**	**2**
CO2 On completion of this course , the student will be able to apply the concept of random variables in solving engineering problems.(K3 level)			**2**	**2**	**2**
CO3 On the completion of this course, the student will be capable of applying Joint occurrence of two random variables and transformation of random variable.(K3 level)			**2**	**2**	**2**
CO4 On the completion of this course, the student will be able to apply the concept of stochastic process.(K3 level)			**2**	**2**	**2**
CO5 On the completion of this course, the student will be able to apply the concept of stationary distribution of Markov Chain and queuing theory(K3 level)			**2**	**2**	**2**
			2	**2**	**2**
MTEC 102: Advanced Digital Communication					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1 – Understand the principles of baseband data transmission, including Nyquist criteria, correlative coding, filter design, and equalization.	**2**	**2**	**3**	**2**	**1**
CO2 – Analyze various passband digital modulation schemes, synchronization, and symbol timing techniques for efficient data communication.	**2**	**2**	**3**	**2**	**-**
CO3 – Apply error control coding techniques such as block codes, convolutional codes, and turbo codes to improve system reliability.	**2**	**2**	**3**	**2**	**-**
CO4- Analyse spread spectrum communication techniques including DS, FH, and CDMA systems, with a focus on synchronization and practical applications.	**2**	**2**	**3**	**3**	**-**
C05- Apply multichannel, multicarrier, and multi-user communication systems for modern digital communication environments.	**2**	**2**	**3**	**3**	**-**
	2	**2**	**3**	**2.4**	**1**
MTEC 013: Antenna Theory and Design					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: To understand the fundamentals of antenna theory.	**2**	**2**	**2**		
CO2: To understand the different types of antennas and antenna arrays.	**3**	**2**	**2**		
CO3: To understand the synthesis of antenna and method of moments.	**3**	**2**	**2**		
CO4: To apply the different concepts in different antennas and antenna arrays.	**3**	**3**	**3**		**2**
C05: To analyze the performance of antennas and antenna arrays.	**3**	**3**	**3**		
	2.8	**2.4**	**2.4**		**2**

MTEC 021: Optical Communication					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: Understand the basic principles of coherent optical systems and various modulation/demodulation techniques.	**3**	**2**	**3**		**1**
CO2: Analyze the performance of optical amplifiers such as EDFA and Raman amplifiers in high-power digital transmission systems.	**3**	**3**	**2**		
CO3: Apply WDM, TDM, and CDM techniques in multichannel optical communication systems and assess the impact of multiplexing technologies.	**3**	**3**	**3**		**2**
CO4: Analyze the role of SONET/SDH, ATM, and IP protocols in optical networking, including wavelength routing in next-generation optical internet infrastructure.	**3**	**2**	**3**		
C05: Apply soliton-based high-speed WDM systems by incorporating nonlinear effects and soliton dynamics.	**3**	**2**	**1**		**2**
Avg	**3**	**2.4**	**2.4**		**1.67**

MTCC 101: Research Process & Methodology					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: Explain concept/Fundamentals of the different types Research.		**3**	**2**		**2**
CO2: Apply relevant research design technique.		**3**	**2**		**2**
CO3: Use appropriate data collection technique.		**3**	**2**		**2**
CO4: Evaluate statistical analysis which includes various parametric test and non parametric test and ANOVAs technique.		**3**	**2**		**2**
C05: Prepare research report and publish ethically.		**3**	**2**		**2**
		3	**2**		**2**

MTEC 151: Lab I: Optical Fibre Communication Lab					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: Demonstrate the concept of optical fiber link establishment.	**2**	**1**		**2**	**1**
CO2: Measure losses and optical fiber parameters.	**2**	**1**	**1**	**2**	
CO3: Understanding the characteristics of communication channels			**2**	**2**	
CO4: Demonstrate the concept of various modulation techniques				**3**	**2**
C05: Demonstrate various coding and decoding schemes for optical	**2**			**3**	**2**
	2	**1**	**1.5**	**2.4**	**1.67**

MTEC 152: Lab II: Communication Engineering Lab					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: Apply the knowledge of statistical theory of communication and explain the conventional digital communication system.	**2**	**2**	**2**		
CO2: Apply the knowledge of signals and system and evaluate the performance of digital communication system in the presence of noise.	**2**	**2**	**2**		
CO3: Apply the knowledge of digital electronics and describe the error control codes like block code, cyclic code.	**2**	**2**	**2**	**2**	
CO4: Describe and analyze the digital communication system with spread spectrum modulation.	**2**	**2**	**2**		
C05: Design as well as conduct experiments, analyze and interpret the results to provide valid conclusions for digital modulators and demodulator using hardware components and communication systems using CAD tool.	**2**	**2**	**2**	**2**	
	2	**2**	**2**	**2**	

MTEC 201: Discrete Time Signal Processing					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: To understand digital signal processing in real world applications	**2**	**-**	**3**		**3**
CO2: Analysis of various multirate signal Processing	**3**	**1**			**1**
CO 3: To illustrate various filtering methods	**3**	**2**	**2**		**2**
CO4: Computation of discrete fourier transfomation properties	**3**	**3**	**1**		**2**
C05: Study Various digital signal Processors	**3**	**2**			
	2.8	**2**	**2**		**2**

MTEC 202: Detection and Estimation Theory					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: Solving problems involving the detection of signals in the presence of noise using statistics from basic detection theory	**3**	**2**	**3**		**1**
CO2: Discrete-time signal detection using various models.	**3**	**2**	**3**		
CO3: Analysis of optimal estimates for different signal parameters.	**3**	**2**	**3**		
CO4: To illustrate various filtering methods and orthogonality principles, and their applications.	**3**	**2**	**3**		**2**
C05: Illustrate the detection of signals in continuous time.	**3**	**2**	**3**		
	3	**2**	**3**		**1.5**

MTEC 031: Internet of Things					
	PO1	PO2	PO3	PO4	PO5
CO1: Interpret the vision of IoT from a global context.	2	2	2		
CO2: Implement state of the art architecture in IoT.	3	2	2		
CO3: Discuss on IoT reference layer and various protocols and wireless sensor network.	3	2	2	3	
CO4: Evaluate wireless technologies for IoT and software.	3	2	3	3	2
C05: Appreciate the need for IoT applications.	3	2	3		
	2.8	2	2.4	3	2

MTEC 042: Advanced Satellite Communication					
	PO1	PO2	PO3	PO4	PO5
CO1: Explain satellite orbits, elements, and visibility for communication performance.	3		3		3
CO2: Outline key spacecraft subsystems and perform satellite link analysis.	3	1			1
CO3: Apply FDMA systems, intermodulation effects, and noise performance.	3	2	2		2
CO4: Describe TDMA structure, synchronization, and channel capacity analysis.	3	3	1		2
C05: Analyze applications of satellite services like VSAT, GPS, and DBS.	3	2			
	3	2	2		2

MTEC 051: Advanced Wireless Networks					
	PO1	PO2	PO3	PO4	PO5
CO1: To formulate basic architecture of GSM system.	2		3		3
CO2: To demonstrate the basic concept of wireless standards	2	1			1
CO3: To explain the cellular concept and efficient frequency utilization.	3	2	2		2
CO4: To analyse the performance of Wi-Max physical layer	3	3	1		2
C05: To apply the concept of Wi-Max MAC to wireless system.	3	2			
	2.6	2	2		2

MTEC 251: Lab III: Modeling and Simulation of Communication System Lab					
	PO1	PO2	PO3	PO4	PO5
CO1: To formulate the concepts of analog communication circuits using simulation software	2	2	3	3	1
CO2: To formulate the concepts of digital communication circuits using simulation software.	2	2	3	3	1
CO3: Modeling and Analysis of Spread Spectrum Technology.		2	2	3	
CO4: Inspection of eye patterns using simulation software.		2	2	3	
C05: Investigation and Implementation of various codes using simulation software.	2	2	3	3	1
	2	2	2.6	3	1

MTEC 252: Seminar I					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: Identify recent trends, challenges, and advancements in the domain of Electronics and Communication Engineering.	**3**			**2**	**2**
CO2: Review and interpret technical research papers, patents, and industry reports in the ECE field.	**3**				**2**
CO3: Apply engineering concepts to analyze a selected topic and present technically sound conclusions.			**3**	**2**	**2**
CO4: Develop effective technical documentation and structure a professional seminar report.		**3**			**2**
C05: Deliver confident and articulate presentations using modern tools and techniques.				**3**	**2**
	3	**3**	**3**	**2.33**	**2**

MTEC 351: Seminar II					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1: Identify recent trends, challenges, and advancements in the domain of Electronics and Communication Engineering.	**3**			**2**	**2**
CO2: Review and interpret technical research papers, patents, and industry reports in the ECE field.	**3**				**2**
CO3: Apply engineering concepts to analyze a selected topic and present technically sound conclusions.			**3**	**2**	**2**
CO4: Develop effective technical documentation and structure a professional seminar report.		**3**			**2**
C05: Deliver confident and articulate presentations using modern tools and techniques.				**3**	**2**
	3	**3**	**3**	**2.33**	**2**

MTEC 352: Dissertation					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1:Students will be able to identify, select, and clearly define a relevant product, research, or application-based project with clarity and purpose.	**3**		**3**		**3**
CO2:Students will be able to design and analyze the proposed project using appropriate engineering principles, tools, and modern techniques..	**3**		**3**	**3**	
CO3:Students will be able to implement, develop, and test the project using suitable methods and tools to ensure its functionality and effectiveness.	**3**		**3**	**3**	
CO4:Students will be able to effectively communicate the project methodology, progress, and outcomes through oral presentations and technical writing.		**3**			**3**
C05:Students will be able to systematically document all stages of the project and manage project activities efficiently, ensuring proper record-keeping and organization.		**3**	**3**		**3**
	3	**3**	**3**	**3**	**3**

MTEC 451: Dissertation					
	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1:Students will be able to effectively implement project tasks and present progress in alignment with defined requirements and timelines.	**3**	**3**	**3**	**3**	
CO2: Students will be able to prepare project reports that strictly adhere to prescribed formatting guidelines and meet academic and professional standards.		**3**			**3**
CO3: Students will be able to identify and integrate relevant subject knowledge and previous learning experiences to enhance the quality and depth of the project.	**3**		**3**	**3**	
CO4:Students will be able to clearly define and structure project content to ensure comprehensive coverage, relevance, and clarity.	**3**	**3**	**3**		
C05:Students will be able to prepare a research paper and effectively communicate project findings to academic or professional audiences through oral and written presentations.	**3**	**3**	**3**		**3**
	3	**3**	**3**	**3**	**3**