3rd Sem

BHARATI VIDYAPEETH'S COLLEGE OF ENGINEERING
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Department of Electronics and Communication Engineering

3.1.1 Course Name: Analog Electronics I (ETEC 203)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 203.1	Understand the structure and operation of different transistors	Understand
ETEC 203.2	Classify and summarise concepts of amplifier circuits with and without feedback	Understand
ETEC 203.3	Apply stabilisation and compensation techniques in BJT amplifiers	Apply
ETEC 203.4	Analyze various small signal amplifiers in both single stage and multi stage configurations.	Analyze
ETEC 203.5	Evaluate the performance of various power amplifiers.	Evaluate
ETEC 203.6	Design different application specific amplifiers.	Create

3.1.2. CO-PO matrix

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO1 2	PSO1	PSO2
ETEC 203.1	3	2											3	
ETEC 203.2	3	3	2										3	
ETEC 203.3	3	3	2	2									3	
ETEC 203.4	3	3	2	3		2							3	
ETEC 203.5	3	3											3	
ETEC 203.6	3	3	3	3	3	2			2			2	3	

1=Slightly, 2=moderately, 3=substantially

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Switching Theory and Logic Design (ETEC 205)

At the end of course, students will be able to:

CO	Statement	Bloom's Level
ETEC 205.1	Remember and understand the concepts of number systems and code conversion.	Remember, Understand
ETEC 205.2	Apply minimization techniques namely Boolean algebra, Karnaugh-map (K-map), Quine McCluskey (QM) method to simplify Boolean functions.	Apply
ETEC 205.3	Evaluate the merits and demerits of digital logic families and Programmable Logic Devices (PLDs).	Evaluate
ETEC 205.4	Design and analyze combinational logic circuits.	Analyze, Create
ETEC 205.5	Design and analyze sequential logic circuits.	Analyze, Create
ETEC 205.6	Develop complex state machines using state diagrams and Algorithmic State Machine (ASM) charts.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 205.1	3	1	1	1								3	3	1
ETEC 205.2	3	1	1	1								3	3	1
ETEC 205.3	3	1	1	1								3	3	2
ETEC 205.4	3	3	3	3								3	3	2
ETEC 205.5	3	3	3	3								3	3	2
ETEC 205.6	3	3	3	3		3		1	1			3	3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Electronic Instruments and Measurements (ETEC 207)

At the end of course, students will be able to:

CO	Statement	Bloom's Level
ETEC 207.1	Contrast the performance characteristics and various errors in basic Measuring instruments.	Analyze
ETEC 207.2	Explain basic meter movement, different types of display devices and printers.	Understand
ETEC 207.3	Describe various types of voltmeters and ammeters	Understand
ETEC 207.4	Explain the basic features of oscilloscope and study of its different types.	Understand
ETEC 207.5	Discuss different electronic instruments like signal generator, wave analyzers, function generator	Understand
ETEC 207.6	Describe digital data recording, transducers and data acquisition system	Understand

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 207.1	3	3	3									2	3	3
ETEC 207.2	3	3	1									3	3	2
ETEC 207.3	3	3	2									3	3	2
ETEC 207.4	3	2	2										3	1
ETEC 207.5	3	2	3										3	3
ETEC 207.6	3	3	3										2	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Data Structures (ETCS 209)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETCS 209.1	Summarize the various types of data structures and programming methodologies.	Understand
ETCS 209.2	Determine various parameters for the purpose of analyzing an algorithm's performance.	Apply
ETCS 209.3	Develop algorithms for manipulating linear and nonlinear data structures.	Apply
ETCS 209.4	Demonstrate a variety of search and sorting techniques.	Understand
ETCS 209.5	Choose an appropriate hashing technique for a given problem.	Apply
ETCS 209.6	Identify the most effective data structures for solving real-world problems.	Apply

3.1.2 CO- PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETCS 209.1	3	2	2	2								1	1	
ETCS 209.2	3	2	2	2								1	1	
ETCS 209.3	3	3	3	2								1	1	
ETCS 209.4	3	2	2	1								1	1	
ETCS 209.5	3	3	3	2								1	1	
ETCS 209.6	3	3	3	2		1						1	1	

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3.1.1 Course Name : Signals and Systems (ETEC 211)

At the end of course, students will be able to:

CO	Statement	Bloom's Level
ETEC 211.1	Define basics of signals and systems with their transformation.	Remember
ETEC 211.2	Understand spectral analysis of periodic and aperiodic signals using Fourier methods and their convolution.	Understand
ETEC 211.3	Apply convolution method to find output and stability of Linear Time Invariant (LTI) systems	Apply
ETEC 211.4	Analyze Continuous Time (CT) Systems using Laplace transform & Discrete Time (DT) systems using Z- transform (ZT).	Analyze
ETEC 211.5	Evaluate CT and DT periodic Signals by using Fourier series coefficients, Laplace Transform (LT) and Z-Transform.	Evaluate
ETEC 211.6	Construct DT signal by sampling and re-construct its original signals from its samples using Low Pass Filter (LPF)	Create

3.1.2 CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 211.1	3	3										2		3
ETEC 211.2	3	3	3									2	2	2
ETEC 211.3	3	3	3									2	3	2
ETEC 211.4	3	3	3									2	2	2
ETEC 211.5	3	3	3									2	3	3
ETEC 211.6	3	2	3									2	3	3

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3.1.1 Course Name : Applied Mathematics III (ETMA 201)

At the end of course, students will be able to:

CO	Statement	Bloom's Level
ETMA 201.1	To understand the concepts of Fourier and numerical analysis.	Understand
ETMA 201.2	To apply the theory of numerical methods, Z-transforms and Fourier transforms to solve various engineering problems which are expressed in terms of difference and differential equations.	Apply
ETMA 201.3	To analyze and interpret the given numerical data.	Analyze
ETMA 201.4	To design problems related to difference equations and differential equations in various technical problems.	Design
ETMA 201.5	To investigate solutions of various real life problems by using numerical techniques and Fourier transformation.	Analyze
ETMA 201.6	To apply the basics of numerical differentiations and integrations which serve as a mathematical tool for the formulations of concerned computer program.	Apply

3.1.2 CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETMA 201.1	3												3	
ETMA 201.2	3				2	2							3	2
ETMA 201.3		3		2							2			3
ETMA 201.4		2		3								2		3
ETMA 201.5	2		3						2					2
ETMA 201.6			2		3								3	

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3.1.1 Course Name : Analog Electronics 1 Lab (ETEC 251)

At the end of course, students will be able to:

CO	Statement	Bloom's Level
ETEC 251.1	Understand and analyse the input and output characteristics of Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET) Configurations.	Remember, Analyze
ETEC 251.2	Design and analyse different transistor biasing circuits for stability.	Create
ETEC 251.3	Understand and evaluate frequency response of multistage amplifiers.	Evaluate
ETEC 251.4	Understand the frequency response of feedback amplifier with and without bypass capacitor.	Understand
ETEC 251.5	Design and analyse the characteristics of single tuned and double-tuned amplifier.	Analyze, Create
ETEC 251.6	Design power amplifier and measure efficiency.	Apply

3.1.2 CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO11	PO12	PSO1	PSO2
ETEC 251.1	3				3							2	3	
ETEC 251.2	3	2	3	3	3							3	3	
ETEC 251.3	3	3		3	3							3	3	3
ETEC 251.4	3	3			3							3	3	
ETEC 251.5	3	3	3		3							3	3	3
ETEC 251.6	3				3	3			3			2	3	2

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3.1.1 Course Name: Switching Theory and Logic Design Lab (ETEC 253)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETEC 253.1	Remember and understand the concepts of basic logic gates.	Remember, Understand
ETEC 253.2	Apply the concept of the digital logic circuit to the design of various adders.	Apply
ETEC 253.3	Understand and analyse the behaviour of sequential circuits like flip-flops.	Understand, Analyse
ETEC 253.4	Design and analyse complex circuits such as ALU and shift registers.	Create
ETEC 253.5	Evaluate the functionality of Mealy and Moore sequential machines.	Evaluate
ETEC 253.6	Design real-world problems like Multiplexers and Priority Encoder.	Create, Apply

3.1.2. CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 253.1	3	1			2							2		1
ETEC 253.2	3	2	2		3							2		1
ETEC 253.3	3	3	2	3	3							2	3	1
ETEC 253.4	3	3	3	3	3							2	3	1
ETEC 253.5	3	3	2	2	3							2	2	1
ETEC 253.6	3	3	3	2	3	2		1	2			2	2	3

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3.1.1 Subject: Course Name : Data Structures Lab (ETCS 255)

At the end of the course, student will be able to

CO	Statement	Bloom's Level
ETCS 255.1	Compare different types of searching and sorting techniques	Evaluate
ETCS 255.2	Utilize arrays and linked lists to build data structures	Create
ETCS 255.3	Create programs to make use of dynamic memory management	Create
ETCS 255.4	Select an appropriate data structure to handle a variety of computing problems	Evaluate
ETCS 255.5	Applying hash functions that avoid collisions when storing and retrieving data	Apply
ETCS 255.6	Select the most suitable data structure and algorithm for resolving a real-world problem.	Apply

3.1.2 CO- PO Matrix

CO	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
ETCS 255.1	3	3	3	3								1	1	
ETCS 255.2	3	3	3	3								1	1	
ETCS 255.3	3	3	3	3								1	1	
ETCS 255.4	3	3	3	3								1	1	
ETCS 255.5	3	3	3	3								1	1	

ETCS 255.6	3	3	3	3								1	1	

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Electronic Instruments and Measurements Lab (ETEC 257)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETEC 257.1	Discuss various display devices like LCD, LED.	Understand
ETEC 257.2	Measure various parameters using RLC meter and multimeter.	Evaluate
ETEC 257.3	Measure the value of Voltage, Frequency & Phase using DSO.	Evaluate
ETEC 257.4	Demonstrate LVDT as a transducer.	Apply
ETEC 257.5	Examine various parameters using Function generator and Frequency Counter.	Analyze
ETEC 257.6	Discuss various type of printers.	Understand

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 257.1	3	3	2									3	3	3
ETEC 257.2	3	3	1									3	3	2
ETEC 257.3	3	3	2									2	3	2
ETEC 257.4	3	2	2										3	1

ETEC 257.5	3	2	3									3	3
ETEC 257.6	3	2	3									3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Signals and Systems Lab (ETEC 259)

At the end of course, students will be able to:

CO	Statement	Bloom's Level
ETEC 259.1	Understand basics of MATLAB syntax, functions, and programming.	Remember, Understand
ETEC 259.2	Generate and characterize various continuous and discrete time signals.	Create
ETEC 259.3	Design and analyze linear time-invariant (LTI) systems and compute its response.	Apply
ETEC 259.4	Analyze the spectral characteristics of signals using Fourier analysis.	Analyze, Create
ETEC 259.5	Analyze the systems using Laplace transform and Z-transform. Find out the stability of system.	Apply

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 259.1	3	1	2		3							2	1	2
ETEC 259.2	3	3	2		3							2	1	3
ETEC 259.3		1	2		3							2	1	2
ETEC 259.4	3	3	3		3							2	1	3
ETEC 259.5	3	3	2		3							2	1	3

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Department of Electronics and Communication Engineering

3.1.1. Course Name: Applied Mathematics IV (ETMA 202)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETMA 202.1	To understand the concepts of probability and statistics.	Understand
ETMA 202.2	To apply the knowledge of numerical methods to solve real life problems.	Apply
ETMA 202.3	To analyze and interpret statistical data.	Analyze
ETMA 202.4	To design problems related to partial differential equations and linear programming.	Design
ETMA 202.5	To investigate statistical constants for various probability distributions.	Analyze
ETMA 202.6	To recognize the need for various mathematical programming approaches to solve technical problems.	Apply, Analyze

3.1.2 CO-PO Matrix

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2
ETMA 202.1						2					2		3	
ETMA 202.2	3		2			3	2				2		3	2
ETMA 202.3		3		2										3
ETMA 202.4		3												3

ETMA 202.5	2		3										3
ETMA 202.6				2	3				2				3	

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3.1.1. Course Name: Analog Electronics-II (ETEC 204)

At the end of the course, students will be able to

CO	Statement	Bloom's level
ETEC204.1	Remember and understand the basic internal circuit of operational amplifier (Op-Amp) IC.	Remember, understand
ETEC 204.2	Understand linear and nonlinear operation of Op-Amp.	Understand
ETEC 204.3	Implement active filters using Op-Amp.	Apply
ETEC 204.4	Analyze operational Transconductance Amplifier (OTA) and Regulators ICs.	Analyze
ETEC 204.5	Evaluate different types of multivibrators using Op-Amp.	Evaluate
ETEC 205.6	Design different application-based circuits using OP-Amp ICs.	Create

3.1.2 CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC204.1	3	3										3	2	3
ETEC 204.2	3	3	3									2	3	3

ETEC 204.3	3	3	3									2	3	3
ETEC 204.4	3	3	3									2	2	3
ETEC 204.5	3	3	3									2	3	3
ETEC 204.6	3	3	3						3			2	3	3

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3.1.1. Course Name: Network Analysis and Synthesis (ETEC 206)

At the end of course, students will be able to:

CO	Statement	Bloom's level
ETEC 206.1	To understand basics of electrical signals and systems with nodal, mesh, Kirchhoff's voltage law and Kirchhoff's current law analysis.	Remember
ETEC 206.2	To understand, analyse linear and time invariant network for transientand steady state response using classical and laplace transform method.	Understand
ETEC 206.3	To analyse network functions for linear networks using Hurwitz Criteria.	Analyze
ETEC 206.4	Evaluate electrical two port networks using Z, Y, h, ABCD parameters.	Evaluate
ETEC 206.5	Apply Foster and Cauver forms to synthesize the linear networks with passive elements.	Apply
ETEC 206.6	To design and evaluate filters using Passive elements.	Create

3.1.2 CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 206.1	3	1										1	2	

ETEC 206.2	3	3	2									2	1	
ETEC 206.3	3		2									1		
ETEC 206.4	2											2	3	
ETEC 206.5	2											1		
ETEC 206.6	2	3	2									2	3	

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3.1.1. Course Name: Communication Systems (ETEC 212)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETEC 212.1	Understand the concepts of Basic communication systems	Remember, Understand
ETEC 212.2	Solve numerical problems related to random signals and communication systems	Apply
ETEC 212.3	Analyze the effect of noise on communication systems and different modulation schemes.	Analyze
ETEC 212.4	Formulate the method of implementation of different modulation schemes and their demodulation systems including receiver design.	Evaluate
ETEC 212.5	Evaluate the performance of different communication techniques in terms of various parameters	Evaluate
ETEC 212.6	Create a communication design model using simulation-based software.	Create

3.1.2. CO – PO matrix

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
ETEC 212.1	3											2	2	2
ETEC 212.2	3	3										2	2	2
ETEC 212.3	3	3		2								2	2	1
ETEC 212.4	3	3	3	2								2	3	3
ETEC 212.5	3	3	3	3								2	3	3
ETEC 212.6	3	3	3	3	3							3	3	3

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3.1.1. Course Name: Electromagnetic Field Theory (ETEE 210)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETEE 210.1	Understand rectangular, cylindrical and spherical coordinate system and del operator and it's physical interpretation.	Remember, Understand
ETEE 210.2	Understand distribution of charges, electrostatic fields and boundary conditions for electric field.	Remember, Understand
ETEE 210.3	Understand distribution of current, magnetic fields, and boundary conditions for magnetic field.	Remember, Understand
ETEE 210.4	Understand point form and integral form of Maxwell's equation for free space, dielectric media and conductor.	Understand
ETEE 210.5	Apply Maxwell's equation to define wave equation and propagation of electromagnetic wave.	Apply, Analyze
ETEE 210.6	Analyze two wire transmission line with the application of Maxwell's equation and wave equation.	Apply, Analyze

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEE 210.1	3	3	3	3								3		3
ETEE 210.2	3	3		3										
ETEE 210.3	3	3		3										
ETEE 210.4	3	3		3										2
ETEE 210.5	3	3	3	2	3							3		3
ETEE 210.6	3	3		3	3							3	3	3

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3.1.1 Course Name: Computer Organisation & Architecture (ETCS 204)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETCS 204.1	Understand the concept of different number systems and their conversions.	Remember, Understand
ETCS 204.2	Study the internal architecture of a computer system and the interconnections.	Remember, Analyze
ETCS 204.3	Implement a computer system using register transfer language and micro-operations.	Create, Apply,
ETCS 204.4	Design arithmetic and logic unit,control unit of a computer system.	Apply, Create
ETCS 204.5	Build digital logic circuits and digital components of a microprocessor.	Apply, Create
ETCS 204.6	Evaluate different types of memories of a computer system and their interconnection.	Evaluate

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETCS 204.1	1	1												
ETCS 204.2	2	3		3	3							2	2	1
ETCS 204.3	3	3		3	3							1		
ETCS 204.4		3	3		3							2	2	

ETCS 204.5	3	3		3	3				1			2	2	
ETCS 204.6			3	3	3							1	1	1

1=Slightly, 2=moderately, 3=substantially

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Department of Electronics and Communication Engineering

3.1.1. Course Name: Applied Mathematics IV Lab (ETMA 252)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETMA 252.1	To understand the concepts of numerical methods.	Understand
ETMA 252.2	To apply the theory of numerical methods to formulate a computer program of various technical problems.	Apply
ETMA 252.3	To analyze and interpret the given numerical data.	Analyze
ETMA 252.4	To design program codes based on applications of mathematics in real life problems.	Design
ETMA 252.5	To investigate solutions of various real life problems.	Analyze
ETMA 252.6	To formulate a computer program based on numerical methods which serve as a mathematical tool for the solution of various numerical problems.	Apply

3.1.2 CO-PO Matrix

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2
ETMA 252.1											1		3	
ETMA 252.2	3				2						2			2
ETMA 252.3		3		2										2

ETMA 252.4				3		2								2
ETMA 252.5	2	2	3											2
ETMA 252.6			2	2	3				2				2	

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Department of Electronics and Communication Engineering

3.1.1. Course Name: Analog Electronics II Lab (ETEC 254)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETEC 254.1	Remember and understand basic operation of operational amplifier (op-amp) in inverting and non-inverting mode.	Remember
ETEC 254.2	Understand open-loop and closed-loop configuration of an op-amp.	Understand
ETEC 254.3	Implement positive and negative peak clippers using op-amp.	Apply
ETEC 254.4	Implement and analyze frequency response of non-linear op-amp based wave shaping circuits.	Analyze
ETEC 254.5	Evaluate the performance of waveform generators and filters.	Evaluate
ETEC 254.6	Design multivibrators using 555 timer IC.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 254.1	2	1	1									2	3	1
ETEC 254.2	2	1	3	2								2	3	1
ETEC 254.3	2			3								2	3	2

ETEC 254.4	1	1	3	3								2	3	2
ETEC 254.5	3	2	1	2		1						2	3	2
ETEC 254.6	3	3	3	3		2						3	3	3

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Department of Electronics and Communication Engineering

3.1.1. Course Name: Network Analysis and Synthesis Lab (ETEC 258)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETEC 258.1	Remember basics of electrical circuits with nodal, mesh, Kirchhoff's voltage law(KVL) and Kirchhoff's current law(KCL) analysis.	Remember
ETEC 258.2	Understand transient response of linear system for basic input waveforms	Understand
ETEC 258.3	Evaluate electrical two port networks using Z,Y,h and ABCD parameters	Evaluate
ETEC 258.4	Apply Network Theorem for linear and time invariant circuits.	Apply
ETEC 258.5	Analyze different interconnection and determine two port network parameters.	Analyze
ETEC 258.6	Design different types of circuits using passive elements.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 258.1	3													
ETEC 258.2	3	3		3									3	

ETEC 258.3	3	3	3										3	
ETEC 258.4	3			3									3	
ETEC 258.5	3		3		3									
ETEC 258.6	3		3		3				2			3	3	3

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3.1.1. Course Name: Communication System Lab (ETEC 256)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETEC 256.1	Understand the concepts of Basic communication systems	Remember, Understand
ETEC 256.2	Solve numerical problems related to random signals and communication systems	Apply
ETEC 256.3	Analyze the output the simulation of modulation and demodulation implementation on MATLAB	Analyze
ETEC 256.4	Formulate the method of implementation of different modulation schemes and their demodulation systems including receiver design.	Evaluate
ETEC 256.5	Evaluate the performance of different communication techniques in terms of various parameter	Evaluate
ETEC 256.6	Create a communication design model using MATLAB simulation.	Create

3.1.2. CO – PO matrix

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
ETEC 256.1	3											2	2	2
ETEC 256.2	3	3										2	2	2
ETEC 256.3	3	3		2								2	2	1
ETEC 256.4	3	3	3	2	3							3	3	3
ETEC 256.5	3	3	3	3	3							3	3	3
ETEC 256.6	3	3	3	3	3				3			3	3	3

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Department of Electronics and Communication Engineering

3.1.1. Course Name: Computer Organisation & Architecture lab (ETCS 260)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETCS 260.1	Defined different number systems and their use in a computer system.	Remember, Understand
ETCS 260.2	Explain microprocessor with low level instructions.	Remember, Analyze
ETCS 260.3	Analyze the transfer of data between various components of a computer system.	Create, Apply, Evaluate

ETCS 260.4	Analyze the memory requirements of various data transfer operations and optimize it.	Apply, Create
ETCS 260.5	To apply various low level instructions for data transfer.	Apply, Create
ETCS 260.6	Effectively program a microprocessor and understand its interfacing.	Evaluate

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETCS 260.1	3			3										
ETCS 260.2						2						3		
ETCS 260.3		3	3	3	3							2	1	1
ETCS 260.4		3		3	3								1	1
ETCS 260.5	3	3		3	3							3		
ETCS 260.6			3	3	3				1				1	1

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3.1.1. Course Name: NSS (ETSS 250)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETSS 250.1	Understand the community in which they work	Understand

ETSS 250.2	Identify the needs and problems of the community and involve them in problem-solving.	Apply
ETSS 250.3	Identify the needs and problems of the community and involve them in problem-solving	Analyze
ETSS 250.4	Utilize their knowledge in finding practical solutions to individual and community problems	Create
ETSS 250.5	Develop capacity to meet emergencies and natural disasters.	Remember
ETSS 250.6	Acquire leadership qualities and democratic attitudes.	Apply

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETSS 250.1	3	3												
ETSS 250.2	3	3										3		
ETSS 250.3	3	3	3	3								3		
ETSS 250.4	3	3	-	3								3		
ETSS 250.5					3				3			3		
ETSS 250.6	3	3	3	3				3			2	3		

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5th Sem

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Communication Skills for Professionals (ETHS 301)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETHS 301.1	Recall the process of communication and its effect on giving and receiving information	Remember

ETHS 301.2	Explain the role of body language and voice tone in effective communication	Understand
ETHS 301.3	Compose an effective speech through frequent critique and revision, rehearsal.	Apply
ETHS 301.4	Develop language appropriately for interviews, group discussion and public speaking	Analyze
ETHS 301.5	Create nuances of English speech sounds, word accent, intonation and rhythm	Evaluate
ETHS 301.6	Develop leadership skills, design a resume, a cover letter, and a profile on professional social media sites	Create

3.1.2. CO-PO matrix

CO	PO 1	P O2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETHS 301.1										3				
ETHS 301.2										2				
ETHS 301.3										2				
ETHS 301.4										3				
ETHS 301.5										2				
ETHS 301.6									3					

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Digital Communication (ETEC 303)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 303.1	Understand the concepts of Basic digital communication systems.	Remember, Understand
ETEC 303.2	Solve numerical problems related to random signals, digital communication systems and signal to noise ratio	Apply
ETEC 303.3	Analyze the limitations of practical communication channels and the methods of overcoming those limitations	Analyze
ETEC 303.4	Formulate the method of implementation of different modulation	Evaluate
ETEC 303.5	Evaluate the performance of different digital communication techniques in terms of different parameters.	Evaluate
ETEC 303.6	Create a digital communication system design model using simulation software	Create

3.1.2. CO-PO matrix

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
ETEC 303.1	3											2	2	2
ETEC 303.2	3	3										2	2	2
ETEC 303.3	3	3		2								2	2	1
ETEC 303.4	3	3	3	2								2	3	3
ETEC 303.5	3	3	3	3								2	3	3
ETEC 303.6	3	3	3	3	3							3	3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Microprocessor and Microcontroller (ETEC 305)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 305.1	Understand microprocessor and microcontroller internal architecture and its operation.	Remember, Understand
ETEC 305.2	Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor and microcontroller.	Apply
ETEC 305.3	Compare microprocessors and microcontrollers to analyze specific performance requirements.	Apply, Analyze
ETEC 305.4	Analyze different peripherals (8255, 8253 etc.) interfacing with a microprocessor.	Analyze
ETEC 305.5	Understand assembly language programs and machine codes.	Understand
ETEC 305.6	Develop solutions for specific applications.	Create

3.1.2 CO-PO Matrix

CO	PO 1	PO 2	PO3	PO4	PO 5	PO6	PO7	PO 8	PO9	PO10	PO11	PO1 2	PS O1	PSO2
ETEC 305.1	3	3	2	2	1							3	3	3
ETEC 305.2	3	3	2	2	2							3	3	3
ETEC 305.3	3	3	2	2	3							3	3	3
ETEC 305.4	3	3	2	2	3							3	3	3
ETEC 305.5	3	3	3	2	2							3	3	3
ETEC 305.6	3	2	3	2	3	2		2	3			3	3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Control Systems (ETEL 307)

At the end of the course, student will be able to

CO	Statement	Bloom's Level
ETEL 307.1	Understand the fundamentals of a control system, its classification and the concept of transfer function.	Remember, Understand
ETEL 307.2	Apply block diagram and signal flow graph (SFG) techniques to describe the working of different control components.	Apply
ETEL 307.3	Define time domain performance specifications and discuss the time response of a system.	Understand, Analyze
ETEL 307.4	Describe the concept of stability using time domain analysis method.	Understand, Analyze
ETEL 307.5	Evaluate the relative stability using frequency domain analysis methods.	Analyze, Evaluate
ETEL 307.6	Design and study the controllers, lead Lag/Lead/Lag-Lead networks/ or compensators using the Bode plot.	Evaluate, Create

3.1.2. CO-PO matrix

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEL 307.1	3											2		
ETEL 307.2	3		1									2	2	2
ETEL 307.3	3	3	2									2	3	2
ETEL 307.4	3	3	2									3	3	2
ETEL 307.5	3	3	2									3	3	2
ETEL 307.6	3	3	3	3								3	3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Digital System Design (ETEC 309)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 309.1	Study and understand the concepts of digital logic, capabilities of digital circuits, Very High Speed Integrated Circuit (VHSIC) Hardware Description Language (VHDL) and programmable devices.	Remember, Understand
ETEC 309.2	Apply the behavior of various kind of concurrent and sequential statements pertaining to VHDL	Apply
ETEC 309.3	Analyze and implement logical operations of various combinational and sequential logic circuits using VHDL	Understand, Analyze
ETEC 309.4	Design and optimize complex circuits.	Create
ETEC 309.5	Validate the functionality of digital circuits using Test cases	Evaluate
ETEC 309.6	Design and Conduct experiments of CAD tools.	Create, Apply

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 309.1	3												3	1
ETEC 309.2	2	1			2								3	1
ETEC 309.3	2	3	3	2	2								3	1
ETEC 309.4	2	3	3	2	2							2	3	3
ETEC 309.5	2	2	3	3	3							2	3	3
ETEC 309.6	2	2	3	3	3	2		1	2			2	3	3

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3.1.1 Course Name: Industrial Management (ETMS 311)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETMS 311.1	Define Industrial relations and disputes to recognize ethical and professional responsibilities in industry.	Remember, Understand
ETMS 311.2	Understand the concepts, objectives and needs of industrial relations, trade unions, labour legislations and machinery to handle industrial disputes.	Understand
ETMS 311.3	Apply their knowledge of work study and work measurement as needed using appropriate tools of total quality management.	Apply
ETMS 311.4	Identify and compare various applications of work study to produce solutions for industry that meet their specified needs including environmental and economic factors.	Analyze
ETMS 311.5	Choose the determinants of quality that help in quality control using control charts.	Evaluate
ETMS 311.6	Design a more efficient work-flow to increase the productivity of both man and machine by also minimizing the defects.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETMS 311.1								3			3			3
ETMS 311.2									3		3			3
ETMS 311.3	3			2	3									3
ETMS 311.4		3					3							3

ETMS 311.5					2						2			
ETMS 311.6			3											3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Digital System Design Lab (ETEC 351)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETEC 351.1	Understand the functional verification and HDL synthesis CAD tools for digital logic.	Remember, Understand,
ETEC 351.2	Model the combinational logic with VHDL language.	Understand, Apply
ETEC 351.3	Model the sequential logic in VHDL language.	Understand, Apply
ETEC 351.4	Evaluate the functioning of digital circuits using test benches.	Understand, Evaluate
ETEC 351.5	Create a hierarchical design model of a digital system.	Create, Evaluate
ETEC 351.6	Create and analyze real world problems into digital logic formulations using CAD tools.	Create, Analyze

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

ETEC 351.1	3	1	1	1	3							2	3	1
ETEC 351.2	3	1	1	1	3							2	3	1
ETEC 351.3	3	1	1	1	3							2	3	1
ETEC 351.4	3	3	2	3	3							3	3	2
ETEC 351.5	3	3	2	3	3	1						3	3	2
ETEC 351.6	3	3	2	3	3	1			3			3	3	3

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3.1.1 Course Name: Communication Skills for Professionals Lab (ETHS 351)

At the end of the course, studentS will be able to

CO	Statement	Bloom's Level
ETHS 351.1	Recall common methods of professional communication	Remember
ETHS 351.2	Demonstrate effective speech through frequent revision, rehearsal.	Understand
ETHS 351.3	Apply effective strategies for a successful interview, group discussion and an interview.	Apply
ETHS 351.4	Discover basic skills required in the preparation of placement and career advancement	Analyze
ETHS 351.5	Assess best practices in workplace etiquette.	Evaluate
ETHS 351.6	Develop listening, note taking and observational skills.	Create

3.1.2. CO-PO matrix

CO	PO 1	P O2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETHS 351.1										3				

ETHS 351.2										2				
ETHS 351.3										2				
ETHS 351.4										2				
ETHS 351.5										3				
ETHS 351.6										3				

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3.1.1 Course Name: Microprocessor and Microcontroller Lab (ETEC 355)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 355.1	Understand the assembly language programming for addition and subtraction of numbers.	Understand
ETEC 355.2	List the instructions to write assembly language programming for multiplication.	Remember
ETEC 355.3	Analyze assembly language programming to generate fibonacci series.	Analyze
ETEC 355.4	Execute program for factorial of a number.	Apply
ETEC 355.5	Evaluate real time interfaces including 8255,8254.	Evaluate
ETEC 355.6	Generate square wave using 8051 microcontroller.	Create

3.1.2 CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2
ETEC 355.1	3	3	2	2	3							3	3	3
ETEC 355.2	3	3	2	2	3							3	3	3
ETEC 355.3	3	3	3	2	3							3	3	3
ETEC 355.4	3	3	2	2	1							3	3	3
ETEC 355.5	3	3	3	3	2							3	3	3
ETEC 355.6	3	3	3	3	3							3	3	3

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3.1.1 Course Name : Control system Lab (ETEL 355)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEL 355.1	Define and formulate transfer function for given control system problems using MATLAB	Remember Understand
ETEL 355.2	Solve the different control problems with and without feedback	Apply
ETEL 355.3	Analyze transient response of the systems on given specifications.	Analyze
ETEL 355.4	Formulate stability of control systems with different methods.	Evaluate
ETEL 355.5	Evaluate the performance of various industrial controllers (P, PI, PID) based control system	Evaluate
ETEL 355.6	Ability to design Lead, Lag, Lead-Lag systems in control systems	Create

3.1.2. CO-PO matrix

CO	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
ETEL 355.1	2													
ETEL 355.2	3	3		3	3								2	2
ETEL 355.3		3		3	3								2	
ETEL 355.4			3	3	3									2
ETEL 355.5			3	3	3								3	2

ETEL 355.6		3	3		3								3	2

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3.1.1 Course Name: Digital Communication Lab (ETEC 357)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETEC 357.1	Understand the concepts of Basic digital communication systems	Remember, Understand
ETEC 357.2	Solve numerical problems related to random signals, digital communication systems and signal to noise ratio	Apply
ETEC 357.3	Practically Analyze the limitations of communication channels and the methods of overcoming those limitations	Analyze
ETEC 357.4	Simulate the method of implementation of different modulation schemes on MATLAB	Evaluate
ETEC 357.5	Evaluate the performance of different digital communication techniques in terms of different parameters using MATLAB	Evaluate
ETEC 357.6	Create a digital communication design model using MATLAB	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
ETEC 357.1	3											2	2	2
ETEC 357.2	3	3										2	2	2
ETEC 357.3	3	3		2								2	2	1

ETEC 357.4	3	3	3	2	3							3	3	3
ETEC 357.5	3	3	3	3	3							3	3	3
ETEC 357.6	3	3	3	3	3				3			3	3	3

1=Slightly, 2=moderately, 3=substantially

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Industrial- Summer Training (ETEC 359)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 359.1	Understand the basic concepts related to the assigned project work during industrial training/certification course.	Understand
ETEC 359.2	Analyze the assigned problem by considering its impact on society and environment.	Analyze
ETEC 359.3	Develop and discuss the design solution for the problem.	Create, Evaluate
ETEC 359.4	Demonstrate the ability to work effectively in team with commitments to professional ethics.	Apply
ETEC 359.5	Compile the project work through proper documentation in the form of project report.	Create
ETEC 359.6	Summarize the project work through individual power point presentations.	Create

3.1.2. CO-PO matrix

CO	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

ETEC 359.1	3	2										1	1	1
ETEC 359.2	1	3		3		2			2	1		1	3	
ETEC 359.3	1	2	3		2					1	2	1	3	2
ETEC 359.4								3	3	2	2		2	1
ETEC 359.5		2				2	1	2	3	3	2		2	
ETEC 359.6		3			1				2	3	1	2	2	2

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6th Sem

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Microwave Engineering (ETEC 302)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 302.1	Understand the concept of wave propagation in TEM / TE / TM mode in rectangular and circular waveguide.	Remember, Understand
ETEC 302.2	Understand the limitation of Z, Y, and H parameters at microwave frequencies.	Remember, Understand
ETEC 302.3	Apply the concept of rectangular waveguide as microwave components Tees, Junctions and couplers, and construct S-matrix.	Understand, Apply
ETEC 302.4	Describe the working of linear beam tubes and cross field tubes as microwave frequencies oscillators and amplifiers	Understand
ETEC 302.5	Understand the working of microwave active components based on transferred electron devices, negative resistance devices, avalanche transit time devices and parametric devices.	Understand
ETEC 302.6	Measure impedance, frequency, VSWR and power at microwave frequency range with the help of detectors and frequency meters.	Analyze

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 302.1	3	3	2	3	3							3	3	3
ETEC 302.2	3				3							3	3	3
ETEC 302.3	3		2		3							3	2	3
ETEC 302.4	3				3							3		2
ETEC 302.5	3				3							3		2
ETEC 302.6	3				3							3	3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Information Theory and coding (ETEC 304)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 304.1	Understand the fundamental concepts of random variables and Information Theory.	Understand
ETEC 304.2	Apply source coding techniques to construct code words and compare there efficacies	Apply
ETEC 304.3	Analyse different discrete memoryless channels and evaluate channel capacity of each one.	Analyse
ETEC 304.4	Analyse error detection and correction codes: Linear Block and Cyclic Codes.	Analyse
ETEC 304.5	Evaluate Bose Choudhary Hocquenghem, Reed Soloman and Golay channel coding schemes for channel performance improvement against errors.	Evaluate
ETEC 304.6	Design convolutional encoder and decoder.	Create

3.1.2. CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 304.1	3	3										3		
ETEC 304.2	3	2	3									3		
ETEC 304.3	3	3	3	2								3		
ETEC 304.4	3	3	3	2								3		3
ETEC 304.5	3	3	3	2								3		3
ETEC 304.6	3	3	3	3								3	1	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Digital Signal and Processing (ETEC 306)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 306.1	Understand frequency domain analysis of discrete time signals using DFT.	Remember Understand
ETEC 306.2	Design and analyze FIR and IIR discrete time filters using various techniques.	Create Analyze
ETEC 306.3	Implement discrete time filters in different filter structures	Apply
ETEC 306.4	Design Lattice Ladder structure for discrete filters using Levinson Durbin technique and Schur's Algorithm	Apply Evaluate
ETEC 306.5	Analyze finite world length effects and different type of quantization error.	Analyze
ETEC 306.6	Discuss the concept of multirate digital signal processing	Understand

3.1.2. CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 306.1	3	3										2	1	2
ETEC 306.2	3	3	3									2	1	2
ETEC 306.3	3	3	3	2								2	1	1
ETEC 306.4	3	3	3	2								2	2	3
ETEC 306.5	3	3	3	2								2	1	3
ETEC 306.6	3	3	2	2								2	1	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: VLSI Design (ETEC 308)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 308.1	Understand the VLSI evolution, MOSFET fabrication and its working principle	Remember, Understand
ETEC 308.2	Design and analyze different MOSFET based inverters	Apply, Analyze
ETEC 308.3	Design MOSFET based combinational and sequential logic circuits with different logic methods	Create, Analyze
ETEC 308.4	Understand principle of MOS circuit optimization techniques	Evaluate, Understand
ETEC 308.5	Demonstrate an understanding VLSI designing methodology for system level design.	Understand, Apply
ETEC 308.6	Create and evaluate as per performance matrix parameters for MOS based circuits using CAD tools.	Create, Evaluate

3.1.2. CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 308.1	3		2									3	1	
ETEC 308.2	3	3	2	2								3	3	2
ETEC 308.3	3	3	2	2		2						3	3	2
ETEC 308.4	3	3	3	3		2						3	3	2
ETEC 308.5	3	3	3	3		2						3	3	3
ETEC 308.6	3	3	3	3	3	3						3	3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Digital Communication and Network (ETEC 310)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 310.1	Learn network communication using the layered concept, Open System Interconnect (OSI) and the Internet Model.	Remember, Understand
ETEC 310.2	Cognize various types of transmission media, network devices; and parameters evaluate performance for each media and device.	Apply, evaluate
ETEC 310.3	Comprehend the concept of flow control, error control and LAN protocols to explain the design of the physical and data link layers.	Analyze
ETEC 310.4	Realize the working principles of LAN and the concepts behind physical and logical addressing, subnetting and supernetting.	Evaluate
ETEC 310.5	Perceive the functions performed by a Network Management System and analyze connection establishment and congestion control with respect to TCP Protocol.	Analyze
ETEC 310.6	Interpret the principles and operations behind various application layer protocols like HTTP, SMTP, FTP.	Apply

3.1.2. CO-PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 310.1	3											2	2	2
ETEC 310.2	3	3										2	2	2
ETEC 310.3	3	3		2								2	2	1

ETEC 310.4	3	3	3	2								2	3	3
ETEC 310.5	3	3	3	3								2	3	3
ETEC 310.6	3	3	3	3	3							3	3	3

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3.1.1 Course Name: Antenna and Wave Propagation (ETEC 314)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 314.1	Understand the basic knowledge of antenna, its radiation mechanism and fundamental parameters of antenna.	Remember, Understand
ETEC 314.2	Apply and calculate vector potentials for electric and magnetic source, linear wire antennas and its radiation properties.	Apply
ETEC 314.3	Analyze utilization of theorems, two element and N-element antenna arrays and concept of phased arrays.	Analyze
ETEC 314.4	Design and analyze different types of planar and non-planar antennas, broadband antennas, travelling wave antennas, long wire antennas & frequency independent antennas.	Analyze, Evaluate
ETEC 314.5	Design different types of antenna and evaluate their performance for realtime application.	Evaluate
ETEC 314.6	Create new designs and analyze mathematical calculations for various Antenna parameters measurement done using anechoic chamber & vector network analyzer	Analyze, Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 314.1	2											3		

ETEC 314.2	3	2		2										
ETEC 314.3	2	2	3	2										2
ETEC 314.4	2	2	3	3		2			1			2		1
ETEC 314.5	2	3	3	3	3	2			1			3	2	2
ETEC 314.6	2	2	3	3	3	2			2			2	2	2

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Microwave Engineering Lab (ETEC 352)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 352.1	Understand basic experimental concepts of Microwave Engineering related to resonance frequency, wavelength, modes	Define
ETEC 352.2	Demonstrate the performance of Non reciprocal components namely Isolators, Circulator.	Understand
ETEC 352.3	Analyse the S-parameters of Tee planes and Directional couplers components and make comparison among them.	Apply
ETEC 352.4	State the basic experimental concepts of Microwave Engineering related to Reflection coefficients, Return loss and VSWR	Analyze
ETEC 352.5	Justify the value of no of modes and tunning range of Reflex klystron tube.	Evaluate
ETEC 352.6	Study different type of Microstrip passive components using MIC.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 352.1	3											2		2
ETEC 352.2	3	3										2		2
ETEC 352.3	3	3	2						2			3		3
ETEC 352.4	3								3			3		3
ETEC 352.5	3	3							3					3

ETEC 352.6	3	3	3		3				2			2	2	3

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3.1.1 Course Name: VLSI Design Lab (ETEC 354)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 354.1	Understand the working of CAD tools for VLSI design.	Remember, Understand
ETEC 354.2	Design and study characteristics of MOSFET.	Understand, Apply
ETEC 354.3	Analyze and study the DC characteristics of different inverters.	Analyze, Apply
ETEC 354.4	Design and evaluate basic CMOS circuits like NAND, NOR, multiplexer.	Analyze, Evaluate
ETEC 354.5	Design and evaluate performance of different complex combinational and sequential circuits.	Evaluate, Create
ETEC 354.6	Understand the concepts of digital system design methods through the practical domain.	Analyze, Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 354.1	3		1		3	3						3	3	1
ETEC 354.2	3	2	1		3				3			3	3	1
ETEC 354.3	3	2	2	1	3							3	3	1
ETEC 354.4	3	2	2	1	3				3			3	3	1
ETEC 354.5	3	3	3	3	3	2			3			3	3	2

ETEC 354.6	3	3	3	3	3	2			3			3	3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Digital Signal Processing Lab (ETEC 356)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 356.1	Understand the concepts of digital signal processing fundamentals such as signal implementation, discrete operations, frequency domain transformations, filter designing.	Remember, Understand
ETEC 356.2	Apply fundamentals for MATLAB simulation of different signal processing tasks like DFT, its properties, convolution, correlation etc.	Apply
ETEC 356.3	Analyse the outputs of MATLAB simulations and correlate with the theoretical understanding of the fundamentals	Analyze
ETEC 356.4	Analyze the output of the MATLAB simulations of FIR and IIR filter design technique and correlate with theoretical understanding.	Analyze
ETEC 356.5	Evaluate the filter design components of direct form and lattice ladder structures using MATLAB	Evaluate
ETEC 356.6	Create a solution to an end to end digital signal processing design problem.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 356.1	3											3	2	2

ETEC 356.2	3	3	2		3							2	1	2
ETEC 356.3	3	3	3	3	3							2	1	2
ETEC 356.4	3	3	3	3	3				3			3	2	3
ETEC 356.5	3	3	3	3	3				3			3	2	3
ETEC 356.6	3	3	3	3	3				3			3	2	3

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3.1.1 Course Name: Digital Communication Network Lab (ETEC 358)

At the end of the course, students will be able to:

CO	Statement	Bloom's level
ETEC 358.1	Understand different internetworking devices, types of networks and their characteristics.	Remember, Understand
ETEC 358.2	Apply discrete event simulator to network simulations.	Apply
ETEC 358.3	Analyse pcap file process	Analyse
ETEC 358.4	Design P2P and CSMA channel networks.	Evaluate
ETEC 358.5	Investigate the effect of queuing disciplines on network performance with the help of discrete event simulator	Evaluate
ETEC 358.6	Implement adhoc network	Create, Evaluate

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

ETEC 358.1	2				2				2			2		
ETEC 358.2	2				2							2		
ETEC 358.3	3	3			2									
ETEC 358.4	3			3	2							2		2
ETEC 358.5	3	3		3	2							2		
ETEC 358.6	3		3	3	2							3		2

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Industrial / In-house Training (ETEC 360)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 360.1	Understand the basic concepts related to the assigned project work during industrial training/certification course.	Understand
ETEC 360.2	Analyze the assigned problem by considering its impact on society and environment.	Analyze
ETEC 360.3	Develop and discuss the design solution for the problem.	Create, Evaluate
ETEC 360.4	Demonstrate the ability to work effectively in team with commitments to professional ethics.	Apply
ETEC 360.5	Compile the project work through proper documentation in the form of project report.	Create
ETEC 360.6	Summarize the project work through individual power point presentations.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 360.1	3	2										1		
ETEC 360.2	1	3		3		2			2	1		1		
ETEC 360.3	1	2	3		2					1	2	1	2	2
ETEC 360.4								3	3	2	2			
ETEC 360.5		2				2	1	2	3	3	2			
ETEC 360.6		3			1				2	3	1	2		

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7th Sem

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3.1.1 Course Name: Embedded System (ETEC 401)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETEC 401.1	Define the basics of embedded systems.	Knowledge
ETEC 401.2	Understand the design process of embedded systems and PIC microcontrollers.	Understand
ETEC 401.3	Apply the operational understanding of various peripheral components and their program development for 8051, PIC & ARM.	Apply
ETEC 401.4	Know hardware software design aspect in embedded system.	Analyze
ETEC 401.5	Evaluate the operating systems and RTOS.	Evaluate
ETEC 401.6	Design different concepts of a RTOS, sensors, memory interface, communication interface.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 401.1	3													
ETEC 401.2	3	3												
ETEC 401.3	3	3	2			1							2	2
ETEC 401.4	3	3	3	1		2							2	2
ETEC 401.5	3	3	3	2									2	2
ETEC 401.6	3	3	3	2	2							3	3	3

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3.1.1 Course Name: Optoelectronics and Optical Communication (ETEC 403)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETEC 403.1	Define the ray propagation in optical fiber using the waveguide structure	Remember, Understand
ETEC 403.2	Understand the basic optical communication system and different kinds of fibers	Understand, Apply
ETEC 403.3	Analyse different transmission characteristics of optical fibers	Apply, Analyze
ETEC 403 .4	Describe the concepts of optical sources, power launching methodologies and coupling methods.	Create
ETEC 403 .5	Compare the characteristics of fiber optic receivers	Evaluate, Create
ETEC 403 .6	Evaluate different optical network topologies and its applications	Understand, Analyze

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 403.1	3											3		
ETEC 403 .2	3	3	2									3	2	3
ETEC 403 .3	3	3	2									3	2	2
ETEC 403 .4	3											3	2	3
ETEC 403 .5	3	3										3	2	3
ETEC 403 .6	3		2	2	2	2						3	2	1

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3.1.1 Course Name: Wireless Communication (ETEC 405)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 405.1	Understand the concepts of various wireless communication technologies	Remember, Understand
ETEC 405 .2	Apply various communication technologies and study the evolution of PCS systems.	Understand, Apply
ETEC 405 .3	Analyze the performance of wireless communication systems with reference to various wireless technologies like 2G,2.5G, 3G, WLAN, Mobile IP etc.	Apply, Analyze
ETEC 405 .4	Develop wireless networks using the concepts learned	Create

ETEC 405 .5	Understand the performance of WLL, Bluetooth, WiMAX, and Manets.	Understand, Analyze
ETEC 405 .6	Investigate the performance of various satellite systems – Globalstar, IRIDIUM etc.	Understand, Analyze

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 405.1	3		3									3		2
ETEC 405 .2	3	2	1	3								3		2
ETEC 405 .3	3	3		2								3		2
ETEC 405 .4	3	3	3	3	3	3						3		2
ETEC 405 .5	3		1		3	3						3		2
ETEC 405 .6	3		1			3						3		2

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Project Management (ETMS 421)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETMS 421.1	Demonstrate understanding of the basic concepts of project management, Project planning and project organization.	Remember, Understand
ETMS 421.2	Understand and define work content, Time estimation method, Project cost estimation and budgeting.	Understand, Create, Analyze
ETMS 421.3	Understand project risk management, project scheduling and planning tools like WBS, LRC, Gantt charts, CPM/PERT networks.	Understand, Create, Analyze
ETMS 421.4	Develop project plan, cash flow analysis, create project scheduling with resource constraints, and create and understand time cost trade off.	Create,Analyze

ETMS 421.5	Implement a project. Project Monitoring and control with PERT/Cost by using computer application in project management.	Create, Apply
ETMS 421.6	Contract management and project procurement management. Create post project analysis.	Understand, Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETMS 421.1	3	3		1					1		3	3		1
ETMS 421.2	3	1	3		1	1	1	2	1	1	3	3		1
ETMS 421.3	3	3	2	3	3	2	1	1	1	1	2	3		1
ETMS 421.4	3	3	3	3	2	1	1	1	1	1	3	3		1
ETMS 421.5	3	3	3	3	3	1	1	1	1	1	3	3		1
ETMS 421.6	3	3	3	1	1	1	1	1	1	2	1	3		1

1=Slightly, 2=moderately, 3=substantially

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Department of Electronics and Communication Engineering

3.1.1. Course Name : Database Management System (ETCS 425)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETCS 425.1	Understand and explain basic concepts of database management system along with storage structures and access techniques	Remember, Understand
ETCS 425.2	Demonstrate working of various database models including Entity Relationship model.	Apply

ETCS 425.3	Examine and execute Structured Query Language (SQL) as well as Relational algebra to find solutions to a broad range of queries.	Apply, Analyze
ETCS 425.4	Organize the database using different Normal Forms to enhance overall database organization.	Analyze
ETCS 425.5	Determine and assess the principles of transaction management and query processing.	Evaluate
ETCS 425.6	Design a database for a particular application using Procedural Language/Structured Query Language(PL/SQL)	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETCS 425.1	3	2	1								1	2	1	
ETCS 425.2	2	3	3	1						3				
ETCS 425.3	3	3		2	1							3	1	
ETCS 425.4	2	3	2	3								1		
ETCS 425.5	2	2	2	2								2	1	
ETCS 425.6	3	3	3	2	1	2		3	3			3		

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3.1.1. Course Name: Optical & Wireless Communication Lab (ETEC 451)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 451.1	Understand the principle of Basic Optical Link	Remember

ETEC 451 .2	Analyze the scan feature of simulation tool to study the performance of the fibre.	Understand
ETEC 451 .3	Evaluate numerical aperture and coupling losses in fibers	Apply Analyze
ETEC 451 .4	Compare different kinds of fibers based on their characteristics	Create
ETEC 451 .5	Create compound components of basic modules in an optical communication system.	Evaluate Create
ETEC 451 .6	Apply the basic concepts to design optical multiplexing systems	Analyze

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 451.1	3				3							3		
ETEC 451 .2	3				3							3	1	
ETEC 451.3	3				3							3	1	
ETEC 451 .4	3	3		2	3							3	1	
ETEC 451 .5	3	3	3	2	3				3			3	1	
ETEC 451 .6	3	3	3	3	3								1	

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3.1.1 Course Name: Embedded System Lab (ETEC 453)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 453.1	Remember basic concepts of 8051 microcontroller and interfacing modules	Remember
ETEC 453.2	Understand ideas and concepts in the interfacing of microcontroller with LEDs in different pattern like on and off all LEDs continuously, on alternate LEDs and rotate glowing LED	Understand
ETEC 453.3	Execute and analyze interfacing of LCD, counter, seven segment display and ADC with 8051 microcontroller	Apply Analyze
ETEC 453.4	Evaluate a square wave of different frequencies using timer for the delay at microcontroller port and see the output on LED	Evaluate
ETEC 453.5	Create ALP for arithmetic operations using ARM processor	Create
ETEC 453.6	Apply concept of interfacing to make any embedded system.	Apply

3.1.2 CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 453.1	3	3				3								
ETEC 453.2	3		3										3	3
ETEC 453.3		3	3									3	3	3
ETEC 453.4		3		3										
ETEC 453.5			3		2									
ETEC 453.6	3				2	3			2			3	3	3

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Lab based on elective-DBMS lab (ETEC 455)

At the end of the course, students will be able to :

CO	Statement	Bloom's Level
ETEC 455.1	Understand the concept of database modelling and discuss a model for a specific problem.	Remember Understand
ETEC 455.2	Implement and Execute various Database language commands.	Apply
ETEC 455.3	Apply the concept of joins and views in various tables.	Apply
ETEC 455.4	Analyse various inbuilt functions of SQL.	Analyze
ETEC 455.5	Evaluate complex queries using nested queries.	Evaluate
ETEC 455.6	Build database applications using PL/SQL structures.	Create

3..1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO 5	PO6	PO 7	PO 8	PO9	PO10	PO11	PO1 2	PSO1	PSO 2
ETEC 455.1	2		3		2				2	2		2	1	
ETEC 455.2	2				2					2		2		
ETEC 455.3	3	3			2	2				2		3	1	
ETEC 455.4	3				2					2		2		
ETEC 455.5	3	3		3	2	3				2		2		
ETEC 455.6	3		3	3	2	3				2		3	1	

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3.1.1 Course Name: Seminar (ETEC 457)

At the end of the course, students will be able to :

CO	Statement	Bloom's level
ETEC 457.1	Acquire awareness on latest technologies and current trends in the field of electronics and communications engineering, and select area(s) of interest.	Remember
ETEC 457.2	Identify problem(s) in the selected area(s).	Understand
ETEC 457.3	Identify and understand the importance of the identified problem(s) in terms of its impact on society and environment	Analyze
ETEC 457.4	Analyze the available solution methodologies in the identified area(s) of interest.	Analyze, Evaluate
ETEC 457.5	Prepare the seminar report in the format prescribed by the department.	Understand Apply
ETEC 457.6	Evaluate the presentation on the basis of presentation design ,verbal communication , skills knowledge of the selected area	Evaluate

3.1.2 CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 457.1	3	1	1	3	2	3	3	1	1			3	2	2
ETEC 457.2	3	3	2	3		3	3	1	1			3	2	2
ETEC 457.3	3	3	1	3		3	3	1	2			3	2	2
ETEC 457.4	3	2	3	3	3	3	3	1	2			3		3
ETEC 457.5	3							1	3	3		3		
ETEC 457.6	3							1	3	3		3		

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Minor Project (ETEC 459)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 459.1	Acquire awareness on latest technology and current trends in the area of interest.	Remember, Understand
ETEC 459.2	Study the prior-art/existing inventions in the selected area of interest, with a comprehensive and systematic approach.	Understand, Analyze
ETEC 459.3	Identify and analyze the existing problems in the selected area.	Understand, Analyze
ETEC 459.4	Learn a modern engineering/programming tool(s) used for implementing and comparing the performance of existing solutions to the identified problem in the area of interest.	Remember, Apply, Analyze
ETEC 459.5	Implement an existing technique, prepare a project report and presentation, as per the prescribed format.	Create, Evaluate
ETEC 459.6	Write a review paper and communicate to a reputed conference/refereed journal.	Create

3.1.2.CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 459.1	1				2			1				2	1	1
ETEC 459.2	2	2		2				1				2	2	2
ETEC 459.3		2		2				1				2	3	3
ETEC 459.4	1	1	2	3	3	2	1		2			1	1	2
ETEC 459.5		2				2	1	2	3	3	2		2	2
ETEC 459.6		3		2		2	2	2	3	3	1	2	1	1

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Industrial Training (ETEC 461)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETEC 461.1	Understand the basic concepts related to the assigned project work during industrial training/certification course.	Understand
ETEC 461.2	Analyze the assigned problem by considering its impact on society and environment.	Analyze
ETEC 461.3	Develop and discuss the design solution for the problem.	Create, Evaluate
ETEC 461.4	Demonstrate the ability to work effectively in team with commitments to professional ethics.	Apply
ETEC 461.5	Compile the project work through proper documentation in the form of project report.	Create
ETEC 461.6	Summarize the project work through individual power point presentations.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 461.1	3	2										1	1	1
ETEC 461.2	1	3		3		2			2	1		1	3	
ETEC 461.3	1	2	3		2					1	2	1	3	2
ETEC 461.4								3	3	2	2		2	1
ETEC 461.5		2				2	1	2	3	3	2		2	
ETEC 461.6		3			1				2	3	1	2	2	2

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8th Sem

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3.1.1 Course Name: Human Values Professional Ethics II (ETHS-402)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETHS 402.1	Define the aspect of diversity and the role of a human being in respecting it.	Remember
ETHS 402.2	Understand the importance of trust, mutually satisfying human behavior and enriching interaction with nature.	Understand
ETHS 402.3	Apply the wisdom to discriminate the superficial success with actual.	Apply
ETHS 402.4	Analyze the comportment through which a professional can experience happiness.	Analyze
ETHS 402.5	Evaluate the professional practices so as to achieve results that are beneficial for the organization and to the society at large.	Evaluate
ETHS 402.6	Create harmony in professional and personal life by developing appropriate technologies and management patterns.	Create

3.1.2 CO- PO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

ETHS 402.1						1		3	2					
ETHS 402.2						1	2	3	2					
ETHS 402.3			2					3						
ETHS 402.4								3				1		
ETHS 402.5			2			2	2	3			2	1		
ETHS 402.6								3	1	1	2	1		

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3.1.1 Course Name: Satellite Communication (ETEC 404)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETEC 404.1	To understand basic Satellite communication theory	Understand
ETEC 404.2	Understand principle, working and operation of various sub systems of satellite as well as the earth stations.	Understand
ETEC 404.3	Apply various communication techniques for satellite applications	Apply
ETEC 404.4	Analyse and design satellite communication link	Create
ETEC 404.5	Contrast advanced techniques and regulatory aspects of satellite communication	Analyze
ETEC 404.6	Understand role of satellite in various applications	Understand

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 404.1	3	3										2	3	3
ETEC 404.2	3	3										2	3	2

ETEC 404.3	3	3										3	3	2
ETEC 404.4	3	3	2	2									3	1
ETEC 404.5	3	3	2	2									3	3
ETEC 404.6	3	3	3	3									3	3

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3.1.1 Course Name: Ad Hoc and Sensor Networks (ETEC 406)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level
ETEC 406.1	Understand issues and challenges in ad-hoc/ sensor networks	Remember
ETEC 406.2	Understand design issues and apply different approach to MAC protocols	Apply
ETEC 406.3	Explain various Ad hoc routing protocols and transport layer mechanism	Apply
ETEC 406.4	Identify the issues and challenges in providing QoS.	Create
ETEC 406.5	Discuss the sensor characteristics and WSN layer protocols	Apply
ETEC 406.6	Discuss wireless geolocation systems and recent advances in wireless system.	Analyze

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 406.1	3					3						3		3
ETEC 406.2	3	2	2	3	3	3						3		3

ETEC 406.3	3	2	2	3	3	3						3		3
ETEC 406.4	3	3	3	3	3	3						3		3
ETEC 406.5	3	2	2	3	3	3						3		3
ETEC 406.6	3	2	2		2	3						3		3

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3.1.1 Course Name: Digital Image Processing (ETIT 418)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETIT 418.1	Define and understand the fundamentals of image processing techniques.	Remember, Understand
ETIT 418.2	Analyze digital images using filtering techniques in the spatial and frequency domain.	Analyze
ETIT 418.3	Understand and apply the concepts of image transform, image compression and segmentation.	Understand Apply
ETIT 418.4	Implement the image enhancement, edge detection and noise analysis.	Apply, Evaluate
ETIT 418.5	Interpret image restoration, segmentation and representation techniques.	Evaluate
ETIT418.6	Demonstrate knowledge of image processing in practical applications.	Create, Apply

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETIT 418.1	3	2	2		2							1	2	1
ETIT 418.2	3	3	2	2	3								1	
ETIT 418.3	3	3	3	3	3							1	1	
ETIT 418.4	3	3	3	3	3							1	1	
ETIT 418.5	3	3	3	3	3								1	
ETIT 418.6	3	3	3	3	3				2			2	1	

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Department of Electronics and Communication Engineering

3.1.1 Course Name: Mobile Computing(ETIT 402)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETIT 402.1	Understand the concept of mobile computing paradigm and architectures.	Remember Understand
ETIT 402.2	Apply different algorithms to build a network in mobile computing.	Apply Understand
ETIT 402.3	Learn the basic concepts of GSM, SMS, GPRS Architecture.	Understand
ETIT 402.4	Evaluate the concepts of IP and TCP in Wireless Networks with mobile nodes.	Analyze Evaluate

ETIT 402.5	Analyze different wireless protocols –Wireless LAN, Bluetooth, WAP, Zig Bee issues.	Understand Analyze
ETIT 402.6	Understand the concepts of Adhoc and wireless sensor networks.	Understand Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETIT 402.1	3	2			1							2		3
ETIT 402.2	3	3	2	2								2		3
ETIT 402.3		3	3	3								1		3
ETIT 402.4		3	3	3	2									3
ETIT 402.5		3	3	3	2									3
ETIT 402.6		2			1							3		2

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3.1.1 Course Name: Computer Graphic and Multimedia(ETIC 428)

At the end of the course, student will be able to

CO	Statement	Bloom's Level
ETIC 428.1	Define and explain basic components of Interactive Computer Graphics System, Input & Output devices, raster & random scan CRT displays and multimedia	Remember, Understand
ETIC 428.2	Apply 2D and 3D transformations (Translation, Scaling, Rotation, Shear, Reflection) to image objects	Apply
ETIC 428.3	Analyse and compare different line and circle algorithms	Analyze

ETIC 428.4	Categorize and clip the line using clipping algorithms and generate curves	Analyze
ETIC 428.5	Evaluate different projection techniques, and discuss various illumination and shading models.	Evaluate
ETIC 428.6	Formulate the computing artefacts to solve complex problems based on various data compression techniques.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETIC 428.1	3	3	2									2	3	2
ETIC 428.2	3	2	2									2	3	
ETIC 428.3	2	3	2										3	3
ETIC 428.4	3	2	2										3	2
ETIC 428.5	3	2	2	3									3	3
ETIC 428.6	3	2	2	3	3							2	3	3

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3.1.1 Course Name : Satellite and Antenna Lab (ETEC 452)

At the end of the course, students will be able to

CO	Statement	Bloom's level
ETEC 452.1	Discuss the concepts of satellite communication.	Understand
ETEC 452.2	Examine the active and passive link used in satellite communication.	Analyze
ETEC 452.3	Interpret the concept of delay in satellite communication network.	Apply

ETEC 452.4	Investigate the performance of sensors used for telemetry commands	Create
ETEC 452.5	Understand the radiation pattern and current distribution of an antenna used in satellite communication	Understand
ETEC 452.6	Understand the concept of SNR in the link generated in satellite communication network.	Understand

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 452.1	3	2											3	2
ETEC 452.2	3	2											3	2
ETEC 452.3	3	2											3	3
ETEC 452.4	3	1	3	3									3	2
ETEC 452.5	3	3	3	2									3	1
ETEC 452.6	3	3	3	2									3	2

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3.1.1 Course Name: Digital Image Processing Lab (ETEC-455)

At the end of the course, students will be able to

CO	Statement	Bloom's Level
ETEC 455.1	Define and understand the image processing techniques.	Remember, Understand
ETEC 455.2	Enhance digital images using filtering techniques in the spatial domain.	Analyze
ETEC 455.3	Enhance digital images using filtering techniques in the frequency domain.	Analyze

ETEC 455.4	Examine and restore images in the presence of only noise through filtering techniques.	Evaluate
ETEC 455.5	Interpret image segmentation and representation techniques.	Evaluate, Analyze
ETEC 455.6	Demonstrate knowledge of image processing in practical applications.	Apply, Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 455.1	3	2	2		2								2	1
ETEC 455.2	3	2	2		3								1	
ETEC 455.3	3	3	3	3	3								1	
ETEC 455.4	2	3	3	3	3								1	
ETEC 455.5	3	3	3	3	3								1	
ETEC 455.6	3	3	3	3	3				2				1	

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3.1.1 Course Name: Mobile Computing (ETEC 454)

At the end of the course, students will be able to:

CO	Statement	Bloom's Level

ETEC 454.1	Understand the concept of mobile computing paradigm and architectures.	Understand
ETEC 454.2	Understand the basic commands used in Mobile computing software for designing networks.	Understand
ETEC 454.3	Configure an adhoc mode network in Mobile computing software	Apply, Create
ETEC 454.4	Configure an infrastructure mode network in Mobile computing software	Apply, Create
ETEC 454.5	Investigate the performance of mobile adhoc networks under different scenarios, using different routing protocols.	Evaluate, Create
ETEC 454.6	Create a multitasking application in wired scenario.	Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2
ETEC 454.1	3	2												2
ETEC 454 .2	3	2			2									2
ETEC 454 .3	3	3	2	3	2									2
ETEC 454 .4	3	3	3	3	3									2
ETEC 454 .5	3	3	3	3	3									2
ETEC 454 .6	3	3	3	3	3									2

1=Slightly, 2=moderately, 3=substantially

BHARATI VIDYAPEETH'S COLLEGE OF ENGINEERING
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Department of Electronics and Communication Engineering

3.1.1 Course Name: Major Project (ETEC 456)

At the end of the course, student will be able to

CO	Statement	Bloom's Level

ETEC 456.1	Identify the research problem(s) and select the problem(s) of interest in the field of engineering.	Understand
ETEC 456.2	Comprehensively discuss and examine the possible solution(s) to the selected problem(s).	Understand, Analyze
ETEC 456.3	Design and implement the solution methodology(s), using modern engineering tool(s).	Create, Apply
ETEC 456.4	Compare and evaluate the performance of the designed solution methodology(s) with the existing methodologies	Analyze, Evaluate
ETEC 456.5	Perform a group-demonstration and document the detailed analysis and results in the Project Report, as per the prescribed format.	Evaluate, Create
ETEC 456.6	Formulate, document and submit a research paper based on the completed performance analysis, with strict adherence to professional ethics.	Evaluate, Create

3.1.2. CO-PO matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETEC 456.1		2		2				1				2	3	2
ETEC 456.2	1	2		2			1					1	2	1
ETEC 456.3	1	2	3		3				2			2	2	2
ETEC 456.4	1	1		3		2	1		2			1	1	1
ETEC 456.5		2				2	1	2	3	3	2		2	
ETEC 456.6		3		2		2	2	3	3	3	1	2	3	2

1=Slightly, 2=moderately, 3=substantially