Innovations by the Faculty in Teaching and Learning

Innovative Teaching Methods:

Innovation and Creativity bring about interest and motivation to learners, which eventually lead to better learning. Few of the innovation techniques adopted in our teaching - learning process is specified herewith.

The Documents are maintained in the respective course file by individual subject teacher.

Sl. No.	Innovative Teaching Methods followed in the Department.
1	Simulation Based learning
2	Activity based Learning (Circuit Ideas & its implementation)
3	Flip-Mode Learning (Circulate Video & Audio material in advance & discuss the related topics in the class)
4	Case Studies –Case based learning (Review paper preparation)
5	Teaching concepts through animation-Animation based learning

Academic Year 2024-2025

Sl. No.	Subject	Topic	Innovative type
1.	DIGITAL SYSTEM DESIGN USING VERILOG (BEC302)	Simulation of Logic Devices	Collaborative Learning
2.	ELECTRONIC PRINCIPLES AND CIRCUITS (BEC303)	Simulation	Collaborative Learning
3.	NETWORK ANALYSIS(BEC304)	Circuit Ideas & its implementation	Collaborative learning Simulation Based Learning Activity based Learning
4.	COMPUTER ORGANISATION AND	Simulation	Collaborative Learning

SI. No.	Subject	Topic	Innovative type
	ARCHITECTURE (BEC306C)		
5.	MATLAB PROGRAMMIG (BEC358B)	To bridge the gap between Academics and Industry students were told about the Industry standards.	WORKSHOP CONDUCTED
6.	Digital Signal Processing (BEC502)	Simulation	Collaborative Learning-
7.	Data Structure using C++ (BEC515C)	Simulation	Collaborative Learning
8.	Research Methodology And Intellectual Property Right (BRMK557)	Presentation	Collaborative Learning
9.	MICROCONTROLLERS (BEC405A)	Simulation	Collaborative Learning
10.	PRINCIPLES OF COMMUNICATION SYSTEMS (BEC402)	Presentation	Collaborative learning
11.	Embedded System Design (BEC601)	Simulation, Case Study	Collaborative learning
12.	Digital Image Processing (BEC613C)	Simulation	Collaborative Learning

Academic Year 2023-2024

SI. No.	Subject	Topic	Innovative type
1.	DIGITAL SYSTEM DESIGN USING VERILOG (BEC302)	Simulation of Logic Devices	Collaborative Learning
2.	NETWORK ANALYSIS(BEC304)	Circuit Ideas & its implementation	Collaborative learning Simulation Based Learning Activity based Learning
3.	COMPUTER ORGANISATION AND ARCHITECTURE (BEC306C)	Case Study - Presentation and Report Writing	Collaborative Learning
4.	DIGITAL COMMUNICATION (21EC51)	Simulation of Digital Circuits	Collaborative Learning-

Sl. No.	Subject	Topic	Innovative type
5.	COMPUTER NETWORKS (18EC71)	Simulation – Simulation of Networks Topologies	Collaborative Learning
6.	VLSI DESIGN (18EC72)	Simulation Based Learning	Collaborative Learning
7.	SATELLITE COMMUNICATION (18EC732)	Presentation	Collaborative Learning
8.	PRINCIPLES OF COMMUNICATION SYSTEMS (BEC402)	Presentation	Collaborative learning
9.	MICROCONTROLLERS (BEC405A)	Presentation	Collaborative learning
10.	Technological Innovation Management and Entrepreneurship(21EC61)	Case Studies	Presentation and Report Writing
11.	MICROWAVE THEORY AND ANTENNAS (21EC62)	Solving Problems on Microwave circuit and Types of Antenna	Flip Learn Mode
12.	PYTHON PROGRAMMING (21EC643)	Simulation	Collaborative learning-

Academic Year 2022-2023

Sl. No.	Subject	Topic	Innovative type
1.	Analog Electronics Circuits (21EC34)	Seminars on concepts of Analog Electronics Circuits.	Collaborative Learning
2.	Circuits and Controls (21EC43)	Simulation of Networks using TINA TI	Simulation and Lab Assignment
3.	Technological Innovation Management and Entrepreneurship (18ES51)	Case Study - Presentation and Report Writing	Collaborative Learning
4.	Information theory and Coding (18EC54)	Flip Mode – Use various channel coding techniques to reduce the probability of error	Flip Mode, Quiz
5.	Digital Communication (18EC61)	To study the different communication principles like digital modulation techniques, baseband data techniques, spectrum modulation techniques etc	Crossword

SI. No.	Subject	Topic	Innovative type
6.	Computer Networks (18EC71)	Simulation – Simulation of Networks Topologies	Collaborative Learning
7.	Wireless Communication (18EC81)	To study cellular concepts and propagation models, GSM, TDMA, CDMA technologies, LTE standardisation	Crossword
8.	Network Security (18EC821)	Apply firewalls and its characteristics through biasing and configuration to provide security for the network	Quiz
9.	Network Security (18EC821)	To explain working of network model and network security in real time applications	Quiz

Academic Year 2021-2022

SI. No.	Subject	Topic	Innovative type
1.	Basic Electronics (21ELN14/24)	Simulation of Analog and Digital Circuits using Multisim	Collaborative Learning
2.	Digital System Design (18EC34)	Quiz on Combinational Circuits	Multiple Choice Questions
3.	Computer Organization and Architecture (18EC35)	Microprocessor Architecture Plan , ARM Cortex plan.	Simulation
4.	Technological Innovation Management and Entrepreneurship (18ES51)	Case Studies	Presentation and Report Writing
5.	Principles of Communication Systems (18EC53)	Develop codes in MATLAB for Simulation of Modulation And Demodulation Techniques	Simulation
6.	Information Theory & Coding (18EC54)	Simulate source and Channel coding algorithms using MATLAB	Simulation
7.	Electromagnetic Waves (18EC55)	Coulomb's Law, EFI, Potential , Laplace Solution	Flip Learn Mode
		MATLAB exercises in Electromagnetic Waves	Collaborative Learning
8.	Verilog HDL (18EC56)	Analyze and Implement digital Systems using HDL	Simulation
		IC design flow	Simulation

		FPGA	Hardware Implementation
		To design the given digital system using Verilog HDL	Collaborative Learning
9.	Computer Networks (18EC71)	Live Demonstration of Switch and Hub	Live Demonstration
10.	Machine Learning (18EC745)	Implementation of mini projects	Collaborative Learning and Simulation
11.	Basic Electronics (21ELN24)	Schmitt Trigger , Inverter using Op Amp	Simulation
		Simulation of Analog and Digital Circuits using MULTISIM	Collaborative Learning
12.	Analog Circuits (18EC42)	Design and Simulation of Analog circuits	Simulation
13.	Control Systems (18EC43)	Response of a Second order system for different damping factors	Simulation
14.	Engineering Statics and Linear Algebra (18EC44)	Implement ESLA concepts using MATLAB and plot the results	Simulation
15.	Signals and Systems (18EC45)	To construct basic signals using MATLAB	Simulation and Collaborative Learning
16.	Microcontroller (18EC46)	8051 codes to interface the peripheral devices	Flip Mode
17.	Digital Communication (18EC61)	Digital Communication Techniques	Collaborative Learning
		Industrial Visit to ISRO	Live Demonstration
18.	Embedded Systems (18EC62)	Design , Formulate and Implement applications using ARM Cortex M3 and its application in IOT	Collaborative Learning
19.	Microwaves and Antennas (18EC63)	Solving Problems on Microwave circuit and Types of Antenna	Flip Learn Mode
20.	Python Application Programming (18EC646)	Python Programming using list dictionaries and regular expressions	Quiz
		Developing Python codes using IDLE	Collaborative Learning
21.	Artificial Neural Networks (18EC642)	Simulation of various neural networks	Simulation

22.	Wireless and Cellular Communication (18EC81)	Implementation of OFDM and CDMA system using MATLAB and SciLab Simulation	Simulation
23.	Wireless Cellular and LTE 4G Broadband (17EC81)	Implementation of SIS - OFDM using MATLAB	Simulation
24.	Fibre Optics & Networks (17EC82)	Optical Fibre Communication sources, detector, amplifiers	Collaborative Learning

Academic Year 2020-2021

Sl. No.	Subject and code	Innovative /Novel Approach practiced	Learning style
1.	Network Theory(18EC32)	Problem Solving	Collaborative Learning
2.	Electronic Devices (18EC33)	Quiz on MOS Transistors and Fabrication of Semiconductor Process	Quiz
3.	Digital System Design (18EC34)	Multiplexer expansion and code converters	SIMULATION
4.	Computer Organization & Architecture (18EC35)	RAM ROM and Virtual Memory	Design
5.	Technological Innovation Management and Entrepreneurship (18ES51)	Case Studies on Entrepreneurship activities and family business	Collaborative Learning
6.	Digital Signal Processing (18EC52)	Realisation of various filters using MAT LAB	Collaborative Learning(Simulation)
7.	Information Theory & Coding (18EC54)	Implementation of ITC concepts using MATLAB	SIMULATION
8.	Verilog HDL (18EC56)	Hardware Modelling using Verilog, IC design flow	SIMULATION
9.	Digital Image Processing (17EC72)	Image Processing Techniques in spatial and frequency domain to enhance and restore the quality of the image	Collaborative Learing
10.	Satellite Communication (17EC755)	Satellite Communication Concepts	Flip Mode

SI. No.	Subject and code	Innovative /Novel Approach practiced	Learning style
11.	Basic Electronics (21ELN14/24)	Simulation of Analog and Digital Circuits using MULTISIM	Collaborative Learning
12.	Analog Circuits (18EC42)	Design and Simulation of Analog Circuits	SIMULATION and Collaborative Learning
13.	Control Systems (18EC43)	Analyse the stability of the system using various time domain and frequency domain techniques	Collaborative Learning
14.	Engineering Statics and Linear Algebra (18EC44)	Implement ESLA concepts using MATLAB and plot the results	Simulation
15.	Signals & Systems (18EC45)	Concepts of Signals and Systems	Video lecture
16.	Microcontroller (18EC46)	Design and Simulate Microcontroller based applications	SIMULATION and Collaborative Learning
17.	Embedded Systems (18EC62)	Implementation of mini projects using Keil and LPC1768 boards	Collaborative Learning
18.	Python Application Programming (18EC646)	Implementation of mini projects	SIMULATION and Collaborative Learning
19.	Artificial Neural Networks (18EC642)	Demonstration of SVM Classifier using virtual lab	SIMULATION
20.	Wireless Cellular and LTE 4G Broadband (17EC81)	Implementation of OFDM and CDMA systems	SIMULATION
21.	Fibre Optics & Networks (17EC82)	Optical Fibre Communication sources, detector , amplifiers	Collaborative Learning
22.	Micro Electro Mechanical Systems (17EC831)	MEMS and micro system products in various industry	Case Study

Academic Year 2019-2020

SI. No.	Subject and code	Innovative /Novel Approach practiced	Learning style
1.	Verilog HDL/ 17EC53	Simulation: Simulation of Digital Circuits and applications	Collaborative learning
2.	Satellite Communication/	Presentation and Report Writing	Flip-Mode

		15EC755		
3.	Object Oriented Programming using C++/17EC562	Simulation: Simulation and demonstration of various topics like pointers, inheritance, files and constructors from C++	Collaborative learning:
4.	Management and Entrepreneurship /17ES51	Collaborative learning: to Have their own start up	Activity based Learning
5.	Information Theory and Coding	Simulation of ITC Algorithm using MATLAB Animation: Convolution coding	1.Simulation 2.Activity Based Learning (Collaborative Learning) 3.Teaching Concepts Through Animation
6.	Digital Image Processing (15EC72)	1)Morphological operation 2) Simulation of Basic Image Processing Techniques	Video demonstration Simulation based learning
7.	Computer Organization And Architecture /18EC35	Collaborative learning: to simulate memory mapping Techniques	Teaching concepts through Animation
8.	Cryptography/ 15EC744	Animations	Animation based learning
9.	VLSI Design/15EC63	Simulation: Simulation of MOS circuits	Collaborative learning:
10	BASIC ELECTRONICS	Design the circuits and check the output of the designed circuit for their accuracy (circuit ideas and its implementation)	Activity based learning
11	COMPUTER ORGANIZATION/18EC35	Circuit Ideas and ;its implementation)	Collaborative learning
12	Digital Signal Processing/15EC52	Simulation: Design and demonstration of filter	Collaborative learning
13	NETWORK THEORY / 18EC32	Simulation using TINA software	Simulation based learning

14	Basic Electronics/ 18ELN14	Teaching concepts through Animation	Collaborative learning:
15	Basic Electrical Engineering 17ELE15/25	Service mains, meter board and distribution board. Concealed conduit wiring	Case Studies
16	Advanced Embedded Systems/ 18EVE13	I2C Communication Interface demonstration.	Animation based learning
17	Multimedia Communication/15 EC741	Analyze the compression techniques using simulation tools like MATLAB	Collaborative learning
18	MICROWAVE AND ANTENNA 15EC71	Klystron Amplifier youtube video Case Studies	Flip-Mode learning
19	Control Systems (18EC43)	Response of a Second order system for different damping factors	Simulation
20	Microcontroller (18EC46)	Design and Simulate Microcontroller based applications	SIMULATION and Collabrative Learning
21	ARM Microcontroller and Embedded Systems (17EC62)	Implementation of mini projects	SIMULATION and Collabrative Learning
22	VSI Design(17EC63)	Quiz	Quiz
23		Design and Simulate CMOS logic structures using Dsh-Microwind Tool	SIMULATION and Collabrative Learning
24	Computer Communication Networks (18EC64)	Simulation of Network Topologies	Collaborative Learning
25		Live Demonstartion of Switch and Hub	Live Demonstartion

SI. No.	Subject and code	Innovative /Novel Approach practiced	Learning style
26	Artificial Neural Networks (17EC653)	Demonstration of SVM Classifier using virtual lab	SIMULATION
27	Digital System Design using Verilog (18EC652)	Simulation of Digital Arithmetic Circuits using modern tool	SIMULATION and Collabrative Learning
28	Wireless Cellular and LTE 4G Broadband (17EC81)	Implementation of OFDM and CDMA systems	SIMULATION

Academic Year 2018 - 2019

SI. No.	Subject and code	Innovative /Novel Approach practiced	Learning style
1.	Computer Communication Network (15EC64)	Simulation and implementation of various routing algorithms.	Collaborative learning:.
2.	VLSI Design (15EC63)	Simulation of MOS circuits	Collaborative learning
3.	ARM microcontroller and Embeddded systems (15EC62)	Design and implementation of simple applications using ARM Cortex M3	Collaborative learning:
4.	ARM microcontroller and Embeddded systems (15EC62)	Case study: Accelerated chip design for drones and cameras with Arm Design Start	Self learning and presentation
		ARM IP in SOC for a wide range of applications	Self learning and presentation
5.	ARM microcontroller and Embeddded systems	Design and implementation of simple applications using ARM Cortex M3	Collaborative learning:

	(15EC62)		
6.	Control Systems (17EC43)	Simulation for control system concepts	Simulation based learning
7.	Signals and Systems (17EC42)	Simulation of Signals and their processing	Collaborative learning:
8.	Digital system design using verilog (15EC663)	Simulation of booth multiplier,8 bit carry look ahead adder,8 bit binary divider,2s complement implementation	Simulation based learning
9.	Multimedia Communication (15EC741)	Demonstration and verification of compression techniques	Collaborative learning:
10.	Basic Electronics (18ELN14)	Implementation of simple circuits using modern tools	Collaborative learning
11.	VLSI Design (15EC63)	Simulation and Fabrication of CMOS circuits through Animations of	Collaborative learning
12.	Microprocessor (17EC46)	Simulation: Execution of 8086 programs	Activity based learning
		Information about advanced microprocessor and implementation of simple programs in hardware	Collaborative learning: to implement simple codes by interfacing hardware to 8086 kit
13.	OOP using C++ (17EC562)	Simulation and demonstration of various topics like pointers, inheritance, files and constructors from C++	Collaborative learning
14.	Digital communication (15EC61)	Simulate and implementation of various digital modulations	Collaborative learning
15.	Power Electronics (10EC73)	Simulation: Simulation of power electronics converter	Collaborative learning
		Activty based learning: Demonstrated the experimental methods in class for few circuits	Collaborative learning:

		Case studies: Application of power electronics: solar, wind power generation systems and laptops and electric vehicles	Case studies
		Animation : AC voltage controller and inverter	Animation based learning

Academic Year 2017-2018

Sl. No.	Subject and code	Innovative /Novel Approach practiced	Learning style
1.	Electrical /17ELE 15/25	Solving Numericals	Collaborative Learning
2.	Analog Electronics 15EC32/3rd	To improve analytical skills	Quiz mode
3.	Analog Electronics 15EC32/3rd	To improve problem solving and analytical ability of students.	Quiz mode Assignment writing
4.	Digital Electronics 15EC33/3rd	To enhances analytical skills	Quiz mode
5.	Digital Electronics 15EC33/3rd	To enhances analytical skills	Quiz mode
6.	Network Analysis 15EC34/3rd	To improve analytical skills. To provide the conceptual view of the circuits.	Quiz mode Collaborative Learning
7.	Network Analysis 15EC34/3rd	To improve analytical skills. To provide the conceptual view of the circuits.	Quiz mode Simulation based learning Collaborative Learning
8.	Electronics Instrumentation- 15EC35/3rd	To improve analytical skills. To provide the conceptual view of measuring instruments.	Quiz mode Assignment writing Collaborative Learning
9.	Engineering Electromagnetic Theory 15EC36/3rd	To improve analytical skills.	Demonstration of electric and magnetic fields using MATLAB

10.	Engineering Electromagnetic Theory 15EC36/3rd	To improve problem solving and analytical ability of students.	Quiz mode Collaborative Learning
11.	Management and Entrepreneur 15ES51/5th	Identify roles of management and their function. Develop a character of successful entrepreneur	Quiz mode Assignment learning Collaborative Learning
12.	Management and Entrepreneur 15ES51/5th	Identify roles of management and their function. Develop a character of successful entrepreneur	Quiz Assignment Collaborative Learning
13.	Digital Signal Processing 15EC52/5th	To improve analytical skills. Implement the algorithms in Mat lab.	Quiz Simulation based learning Collaborative learning
14.	Digital Signal Processing 15EC52/5th	To improve analytical skills. Motivate the students use tools to implement algorithms and techniques	Quiz mode
15.	Verilog HDL 15EC53/5th	To improve analytical skills.	Quiz mode Assignment writing Collaborative Learning
16.	Verilog HDL 15EC53/5th	To improve analytical skills.	Quiz mode Assignment writing Collaborative Learning
17.	Information Theory and Coding 15EC54/5th	To improve analytical skills. Implement the algorithms in Mat lab.	Collaborative Learning
18.	Information Theory and Coding 15EC54/5th	To improve analytical skills. Implement the algorithms in Mat lab.	Quiz mode Collaborative learning
19.	Operating System 15EC553/5th	To improve analytical skills.	Collaborativelearning
20.	Operating System 15EC553/5th	To improve analytical skills.	Quiz mode Collaborative learning

21.	Operating System 15EC553/5th	To improve analytical skills.	Collaborative learning
22.	Automotive Electronics 15EC561/5th	Operation of Engine, sensor working principle	VIDEOS demonstration & PPTs
23.	Programming in C++ 15EC562/5th	To improve design and analytical skills.	Collaborative learning
24.	Programming in C++ 15EC562/5th	To improve design and analytical skills.	Collaborative learning
25.	Computer Communication Network 10EC71/7th	To improve skill in networking.	Quiz mode Collaborative Learning
26.	Optical Fiber Communication 10EC72/7th	For better understanding of subject by Individual and Team work.	Quiz mode Assignment writing Collaborative Learning
27.	Power Electronics 10EC73/7th	To enhance students' knowledge w.r.t to utilization of modern tool for	Quiz mode Presentation based learning Collaborative Learning Simulation based learning
28.	Embedded System Design 10EC74/7th	To improve analytical ability of study	Quiz mode
29.	Embedded System Design 10EC74/7th	To improve analytical ability of study	Quiz mode
30.	DSP Algorithms 10EC751/7th	Concepts of DSP Algorithms	PPTs based learning
31.	Image Processing 10EC763/7th	To enhance problem analysis ability and improve design skills	Quiz mode Collaborative Learning

Academic Year 2016-2017

Sl. No.	Subject and code	Innovative /Novel Approach practiced	Learning style
1.	Basic Electronics 15ELN14	For better understanding of subject by Individual	Quiz mode Collaborative Learning
2.	Basic Electronics 15ELN14	For better understanding of subject by Individual	Quiz mode
3.	Basic Electrical Engineering 15ELE13	For better understanding of subject by Individual and team work	Quiz mode Collaborative Learning
4.	Basic Electrical Engineering 15ELE13	For better understanding of subject by Individual and team work	Quiz mode mode Collaborative Learning
5.	Basic Electrical Engineering 15ELE13	For better understanding of subject by Individual	Quiz mode
6.	Basic Electrical Engineering 15ELE13	For better understanding of subject by Individual and Team work	Quiz mode Collaborative Learning
7.	Microprocessor 10EC62	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
8.	Microprocessor 10E62	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
9.	Microprocessor 10EC62	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
10.	Control Systems 10EC43	Self Learning Usage of Modern Tools for Simulation Individual Team work	Collaborative Learning, Quiz mode
11.	Control Systems 10EC43	For better understanding of subject by Individual	Quiz mode
12.	Signals and Systems 10EC44	For better understanding of subject by Individual Usage of Modern Tools for Simulation	Quiz mode

13.	Signals and systems 10EC44	For better understanding of subject by Individual	Quiz mode
14.	Principles of Communication Systems 10EC45	For better understanding of subject by Individual	Quiz mode
15.	Principles of Communication systems 10EC45	For better understanding of subject by Individual	Quiz mode
16.	Principles of Communication systems 10EC45	For better understanding of subject by Individual	Quiz mode
17.	Linear Integrated Circuits 10EC46	For visual display of circuits and designs For better understanding of subject by Individual	Chart, design Quiz mode
18.	Linear Integrated Circuits 10EC46	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
19.	Linear Integrated Circuits 10EC46	For better understanding of subject by Individual	Quiz mode Collaborative Learning
20.	Digital Communication 10EC61	For better understanding of subject by Individual	Quiz mode
21.	Microprocessor 10EC62	For better understanding of subject by Individual and Team work.	Quiz mode
22.	Microprocessor 10EC62	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
23.	Microelectronics circuits 10EC63	For better understanding of subject by Individual	Quiz mode
24.	Microelectronics circuits 10EC63	For better understanding of subject by Individual	Quiz mode

25.	Antennas and Propagation 10EC64	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
26.	Satellite Communication 10EC662	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
27.	Programming in C++ 10EC665	For improving programming skills	Activity based learning
28.	Wireless Communication 10EC81	Case Study presentation	Quiz mode Collaborative Learning
29.	Digital Switching Systems 10EC82	For better understanding of subject by Individual	Quiz mode
30.	Network Security 10EC843	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
31.	GSM 10EC841	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning
32.	GSM 10EC841	For better understanding of subject by Individual and Team work.	Quiz mode Collaborative Learning