DEPARTMENT OF ELECTRONICS & TELECOM. ENGINEERING

1ST SEM- BASIC ELECTRONICS ENGINEERING(BE)

COURSE OUTCOMES

CO1: Understand the operation and application of semiconductor devices

CO2: Analyze characteristics of FETs

CO3: Apply the Feedback Amplifiers and Operational Amplifiers

CO4: Remember the fundamentals of different Digital arithmetic operations

- **CO-PO Matrix**

COs	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**
CO1	3	2	1	1	2	2	1	-	-	-	-	-
CO2	3	2	1	1	2	2	3	2	1	2	1	2
CO3	3	2	1	1	1	2	-	-	-	-	-	1
CO4	3	1	2	1	2	-	1	-	-		1	1
Average*	3	1.75	1.25	1.2	1.75	2	1.25	0.5	1	0.25	0.5	1

3RD SEM- ANALOG ELECTRONICS CIRCUIT

COURSE OUTCOMES

CO1: Understand BJT biasing and stabilization and analyse transistor re and hybrid models.

CO2: Understand the characteristics and configurations of single stage MOSFET amplifiers.

CO3: Design amplifier circuits using BJT, FET and study the low and high frequency response of BJT, FET amplifiers.

CO4: Understand operational amplifier's specifications, parameters, and its various applications.

- **CO-PO Matrix**

COs	PO 1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO 12
CO1	3	2	1	1	2	2	1	-	-	-	-	-
CO2	3	2	1	1	2	2	3	2	1	2	1	2
CO3	3	2	1	1	1	2	-	-	-	-	-	1
CO4	3	1	2	1	2	-	1	-	-		1	1
Average*	3	1.75	1.25	1	1.75	1.5	1.25	0.5	0.25	0.5	0.5	1

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3RD SEM- SIGNALS AND SYSTEMS)

COURSE OUTCOMES

- CO1: understand the basic properties of signals and systems in both continuous and discrete time.
- CO2: classify systems based on their properties and determine the response of LTI system using convolution.
- CO3: analyse the spectral characteristics of continuous-time periodic and aperiodic signals using Fourier analysis.
- CO4: understand the process of sampling and the effects of under sampling.
- CO5: apply the discrete time Fourier transform for analysis of discrete-time signals.

CO-PO Matrix

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	3	2	1	1	2	2	1	-	-	-	-	-
CO2	3	2	1	1	2	2	3	2	1	2	1	2
CO3	3	2	1	1	1	2	-	-	-	-	-	1
CO4	3	1	2	1	2	-	1	-	-		1	1
CO5	3	3	2	2	2	2	2	-	1	3	1	3
Average*	3	2	1.6	1.2	1.8	2	1.6	2	1	2.5	1	1.6

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4TH SEM DIGITAL SYSTEM DESIGN

COURSE OUTCOMES

CO1: Understand the representation of number systems, binary codes, and Boolean algebra for logic circuit design.

CO2: Design and simplify combinational logic circuits using tools like K-maps and Quine-McCluskey methods.

CO3: Analyze and construct sequential circuits using flip-flops, state diagrams, and finite state machine models.

CO4: Design counters, shift registers, and memory components while understanding programmable logic devices.

CO5: Develop, simulate, and implement basic digital systems using Verilog/VHDL programming.

CO-PO Matrix

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2	2	1	1	2	1	1	-	-	-	-	-
CO2	1	2	1	1	2	1	3	3	2	3	2	1
CO3	1	2	1	1	1	1	-	-	-	-	-	2
CO4	1	1	2	1	2	-	1	-	-		1	1
CO5	1	3	2	2	2	1	2	-	2	2	1	4
Average*	1	2	1.1	1.2	1.4	1	1.6	3	2	2.5	2	1.6

4TH SEM PRINCIPLES OF COMMUNICATION SYSTEM

COURSE OUTCOMES

CO1: Understand the importance of Fourier analysis to communication systems.

CO2: Understand fundamental concepts of analog and digital communication systems.

CO3: Describe various components of communication systems in the time domain and frequency domain.

CO4: Investigate and compare the performance of different communication systems.

CO5: Apply the knowledge to design some basic communication systems on their own.

CO-PO Matrix

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	1	1	1	1	1	1	1	-	-	-	-	-
CO2	2	1	2	1	1	1	2	3	2	3	2	1
CO3	1	2	1	1	1	1	-	-	-	-	-	2
CO4	2	2	2	1	1	-	1	-	-		1	1
CO5	2	1	2	1	2	1	1	-	2	2	2	3
Average*	1	4	1.1	1.1	1.2	1	1.4	3	2	2.2	1.8	1.4

5TH SEM Microprocessor & Microcontroller

COURSE OUTCOMES

CO1: Apply foundational knowledge of electronics, digital systems, and embedded systems to analyze microprocessor/microcontroller-based problems.

CO2: Identify and analyze engineering problems in processor and peripheral interfacing, and propose effective solutions.

CO3: Design embedded system solutions using microcontrollers for real-world applications, considering functional and practical constraints.

CO4: Conduct experiments with microcontrollers, evaluate outputs, and interpret results for debugging and performance analysis.

CO5: Use software tools (e.g., Keil, Proteus, MPLAB, STM32Cube IDE) and hardware kits for simulation, testing, and development of microcontroller-based applications.

CO-PO Matrix

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2	2	2	2	2	1	1	-	-	-	-	-
CO2	1	1	1	1	1	1	2	2	1	1	1	1
CO3	2	1	2	2	2	1	-	-	-	-	-	2
CO4	1	1	2	2	2	-	2	-	-		1	1
CO5	1	2	2	3	1	1	1	-	2	1	2	3
Average*	2	3	1.1	1.5	1.3	1	1.3	2	1	1.2	1.3	1.4

5TH SEM Digital Signal Processing

COURSE OUTCOMES

CO1: Analyze and characterize signals and systems.

CO2: Analyze digital systems in time and frequency domain.

CO3: Demonstrate digital system characterization through DFT and FFT.

CO4: Implement digital filters and systems.

CO5: Demonstrate adaptive signal spectral estimation methods

CO-PO Matrix

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	1	1	2	2	2	1	1	-	-	-	-	-
CO2	2	2	1	1	1	1	2	2	1	1	1	1
CO3	3	2	2	2	2	1	-	-	-	-	-	2
CO4	1	1	1	2	2	-	2	-	-		1	1
CO5	2	1	2	4	1	1	1	-	2	1	2	3
*Average**	2	2	1.2	1.4	1.4	1	1.4	2	1	1.2	1.3	1.2

5TH SEM -WIRELESS COMMUNICATION

COURSE OUTCOMES

CO1: **Classify the wireless channel of a given wireless communication system into the available analytical or empirical models**

CO2: Apply appropriate techniques to mitigate the impact of channel impairments

CO3: Analyse the capacity and reliability of wireless communication systems

CO4: Design and Develop resource efficient and eco-friendly wireless technologies.

CO5: Design and assess modern wireless communication systems considering channel capacity, standard evolution (LTE/5G), and resource efficiency.

CO-PO Matrix

COs	PO 1	PO 1	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2	2	1	1	1	1	1	-	-	-	-	-
CO2	1	1	2	1	2	2	1	1	1	2	1	2
CO3	2	2	2	1	1	1	-	-	-	-	-	1
CO4	1	2	3	2	2	-	2	-	-		1	1
CO5	1	1	1	1	2	2	1	-	2	2	1	2
Average*	2	2	1.3	1.2	1.3	1	1.3	1	1	1.2	1.3	1.3

6TH SEM - DIGITAL COMMUNICATION TECHNIQUES

COURSE OUTCOMES

CO1 **Apply sampling theorem and PCM concepts for digital signal representation and transmission.**

CO2 **Analyze digital and shift-keying modulation techniques (BPSK, QPSK, FSK, MSK, etc.) and evaluate their performance under noise.**

CO3 **Examine digital data transmission methods including line coding, pulse shaping, matched filtering, and error probability estimation.**

CO4 **Apply information theory concepts (entropy, Shannon's theorem, channel capacity) to assess communication system efficiency.**

CO5 **Design and evaluate error detection and correction codes (block, convolutional, and algebraic codes) for reliable data transmission.**

CO-PO Matrix

COs	PO 1	PO 1	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	1	1	2	2	1	1	1	-	-	-	-	-
CO2	2	2	1	1	2	2	1	1	1	2	1	2
CO3	2	1	1	1	1	1	-	-	-	-	-	1
CO4	1	1	2	2	2	-	2	-	-		1	1
CO5	2	1	2	2	2	2	1	-	2	2	1	2
Average*	1.5	1	1.2	1.2	1.3	1	1.2	1	1	1.1	1.2	1.2

6TH SEM - VLSI Design

COURSE OUTCOMES

CO1 Understand MOS transistor behavior, CMOS inverter characteristics, and design metrics.

CO2 Analyze and design basic CMOS combinational and sequential logic circuits.

CO3 Develop synthesizable Verilog HDL for digital systems.

CO4 Design and simulate RTL blocks and finite-state machines.

CO5 Understand synthesis, technology mapping, and FPGA implementation flow.

CO-PO Matrix

COs	PO 1	PO 1	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	1	1	2	2	1	1	2	-	-	-	-	-
CO2	2	3	1	1	2	2	1	1	2	2	1	2
CO3	1	1	1	1	1	1	-	-	-	-	-	1
CO4	2	1	1	2	1	-	1	-	-		1	1
CO5	3	2	1	2	2	1	1	-	2	1	2	2
*Average**	1.5	1	1.2	1.2	1.3	2	1.3	1	2	1.1	1.2	1.2

6TH SEM - OPTICAL AND SATELLITE COMMUNICATION

COURSE OUTCOMES

1. To provide fundamental knowledge of optical fiber communication including ray theory, modes of propagation, attenuation, and dispersion characteristics.

2. To familiarize students with different optical sources and detectors and their operational principles and characteristics.

3. To enable learners to understand fiber optic receiver design, measurement techniques, and performance evaluation.

4. To introduce the principles of satellite communication including orbital mechanics, spacecraft subsystems, and link design.

5. To impart knowledge on multiple access techniques, digital and analog transmission methods, and earth station technologies.

CO-PO Matrix

COs	PO 1	PO 1	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	1	1	2	2	1	1	2	-	-	-	-	-
CO2	1	2	2	1	1	2	1	1	2	2	1	2
CO3	1	1	1	1	1	1	-	-	-	-	-	1
CO4	1	1	1	1	1	-	1	-	-		1	1
CO5	2	1	1	1	1	1	1	-	2	1	2	2
Average*	1.5	2	1.3	1.2	1.3	2	1.3	1	2	1.2	1.3	1.4

7TH SEM - Radar and TV Engineering

COURSE OUTCOMES

- **CO1:** Classify the building blocks and scanning methods used in monochrome and color television systems.
- **CO2:** Discuss the principles of color television operation, including composite video signals, camera tubes, and modulation techniques (PAL, NTSC).
- **CO3:** Describe and differentiate working principles of various digital TV technologies and broadcasting standards.
- **CO4:** Explain the fundamental operation of RADAR systems, including the radar range equation and Doppler effect.
- **CO5:** Analyze the operations of various RADAR receivers, trackers, and displays (PPI, A-scope).
- **CO6:** Identify the principles of navigational aids such as LORAN, ILS, and Radio Compass.

CO-PO Matrix

COs	PO 1	PO 1	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	1	2	2	2	1	1	2	-	-	-	-	-
CO2	1	2	2	1	1	2	1	1	2	2	1	2
CO3	1	1	1	1	1	1	-	-	-	-	-	1
CO4	2	1	1	1	2	-	2	-	-		1	1
CO5	3	1	2	1	1	2	1	-	1	1	1	1
CO6	1	1	1	1	1	1	-	-	-	1	-	1
Average*	1.5	1.3	1.5	1.16	1.16	1.16	1	0.16	0.5	0.6	0.5	1