COs, POs and PSOs mapping examples

16HS201 COMPLEX VARIABLES AND TRANSFORMATIONS

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Apply the concept of Laplace transforms and solve differential equations.

CO2: Apply the concept of Z- transforms and evaluate the difference equations.

CO3: Understanding the concept of Analytical function and to construct the harmonic conjugate of the function.

CO4: Understand the concept of elementary function and evaluate complex integral using Cauchy's theorem and formula.

CO5: Evaluating Integral by using the concept of Residues.

CO6: Applications of Residue Theorem.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	2	-	-	-	-	-	-	-	-	-	2	-	1
CO 2	3	1	2	-	-	-	-	-	-	-	-	-	2	-	1
CO 3	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO 4	3	3	3	-	-	-	-	-	-	-	-	-	2	-	1
CO 5	3	3	3	-	-	-	-	-	-	-	-	-	2	-	1
CO 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg	**3.00**	**2.20**	**2.20**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.80**	**-**	**1.00**

16EC201 MATERIALS FOR ELECTRONICS ENGINEERING

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Classification of materials and Understand the crystal structure.

CO2: Understand the fundamentals of the physical, mechanical, thermal and electronic properties of materials.

CO3: Apply all the electronic Properties of the material into the core electronic devices.

CO4: Applications of materials in the development of various electronic devices.

CO5: Apply electric and dielectric properties in the area of electromagnetic waves.

CO6: Understand the fundamentals of optical properties and applications of nano materials.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 2	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 4	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 5	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
CO 6	2	1	-	-	-	-	-	-	-	-	-	-	2	-	-
Avg	**2.17**	**1.50**	**-**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**-**	**-**

16EC202 ELECTRONIC DEVICES AND CIRCUITS

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Understand the semiconductor devices with the help of V-I characteristics.
CO2: Investigate the characteristics of Amplifier Circuits employing BJT and FET devices.
CO3: Design half wave and full wave rectifiers with and without filters.
CO4: Analyze the working of BJTs and FETs under various biasing conditions.
CO5: Compare CB, CE, CC configurations of BJT and CG,CD,CS configurations of FET.
CO6: Apply the concepts of basic electronic devices to design various circuits.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	-	-	-	-	-	-	-	-	-	2	2	-	-
CO 2	2	3	2	-	-	-	-	-	-	-	-	2	2	-	-
CO 3	2	2	3	-	-	-	-	-	-	-	-	2	2	-	-
CO 4	2	2	-	2	-	-	-	-	-	-	-	2	2	-	-
CO 5	3	3	-	2	-	-	-	-	-	-	-	2	2	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	2	-	-
Avg	**2.33**	**2.50**	**2.50**	**2.33**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**-**	**-**

16EC203 NETWORK THEORY

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Apply KVL, KCL, source transformation, star-delta transformation, voltage and current division rules on Electrical networks.
CO2: Investigate series and parallel circuits with AC excitation and resonant circuits.
CO3: Analyze the transient response of RL, RC and RLC circuits for DC and AC excitations.
CO4: Understand the concepts of various network theorems and applying to the linear circuits.
CO5: Analyze the two port network parameters, Interconnect, Represent and analyze two port networks.
CO6: Determine branch currents and voltages using Tieset and cutest.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	3	2	-	-	-	-	-	-	-	-	-	1	-	1
CO 2	3	2	2	2	-	-	-	-	-	-	-	-	1	-	1
CO 3	3	2	2	2	-	-	-	-	-	-	-	-	1	-	1
CO 4	3	2	2	2	-	-	-	-	-	-	-	-	1	-	1
CO 5	2	2	2	2	-	-	-	-	-	-	-	-	1	-	1
CO 6	2	2	2	2	-	-	-	-	-	-	-	-	1	-	1
Avg	**2.50**	**2.17**	**2.00**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.00**	**-**	**1.00**

16EC204 SIGNALS AND SYSTEMS

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Understand basic signals and analyze the representation using Fourier series.

CO2: Analyze continuous time signals by using appropriate mathematical tools like Fourier Transform and Laplace Transform.

CO3: Analyze the response of a LTI System to any arbitrary inputs and learn about signal transmission through linear systems.

CO4: Apply the concepts of convolution and correlation for continuous time signals.

CO5: Understand the fundamentals of sampling including the implications of sampling theorem.

CO6: Work in a team to analyze and demonstrate the applications of signals and systems.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	-	2	2	-	-	-	-	-	-	-	3	-	-
CO 2	2	3	-	2	2	-	-	-	-	-	-	-	3	-	-
CO 3	3	3	-	2	2	-	-	-	-	-	-	-	3	-	-
CO 4	3	3	-	2	2	-	-	-	-	-	-	-	3	-	-
CO 5	2	3	-	2	2	-	-	-	-	-	-	1	3	-	-
CO 6	2	3	2	2	3	-	-	-	2	2	2	2	3	-	-
Avg	**2.50**	**2.83**	**2.00**	**2.00**	**2.17**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**1.50**	**3.00**	**-**	**-**

16EC205 DIGITAL ELECTRONICS

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Understand number systems and its conversion; simplify Boolean expressions by different methods and implementation using logic gates.
CO2: Apply the Boolean algebra knowledge of mathematics to analyze combinational and sequential digital electronic circuits using K-map and QM technique.
CO3: Design combinational and sequential circuits for the given specifications/constraints.
CO4: Synthesize the state diagram, state table, state equation for Finite state machine.
CO5: Compare the characteristics of logic families for implementing combinational & sequential circuits.
CO6: Demonstrate applications of digital circuits.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	-	-	-	-	-	-	-	-	-	-	1	1	2
CO 2	3	2	3	-	-	-	-	-	-	-	-	-	-	2	2
CO 3	2	2	3	1	-	-	-	-	-	-	-	-	1	2	2
CO 4	2	2	3	1	1	-	-	-	-	-	-	-	2	2	2
CO 5	1	1	2	2	1	-	-	-	-	-	-	-	1	2	1
CO 6	2	3	3	2	2	-	-	-	2	2	2	2	2	1	2
Avg	**2.00**	**2.00**	**2.80**	**1.50**	**1.33**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**1.40**	**1.67**	**1.83**

16EC206 PROBABILITY THEORY AND STOCHASTIC PROCESSES

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Understands the basics of probability, sample space, events, statistics and apply them to real life problems.

CO2: Distinguish probability density and distribution functions for single and multiple random variables.

CO3: Calculate the statistical parameters for random variables.

CO4: Analyze the concept of random process along with its parameters.

CO5: Estimate the correlation, covariance and PSD for random processes.

CO6: Analyze the response of linear systems to random inputs.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO 2	1	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	2	2	1	-	-	-	-	-	-	-	-	-	2	-	-
CO 4	2	2	1	-	-	-	-	-	-	-	-	-	2	-	-
CO 5	2	3	2	1	-	-	-	-	-	-	-	-	2	-	-
CO 6	2	2	2	2	-	-	-	-	-	-	-	-	2	-	-
Avg	**2.00**	**2.00**	**1.50**	**1.50**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.83**	**-**	**-**

16EC207 ELECTRONIC CIRCUIT ANALYSIS

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Analyze and demonstrate negative feedback amplifier circuits and positive feedback oscillators.

CO2: Understand the working of tuned amplifiers.

CO3: Understand and analyze the different multistage amplifiers.

CO4: Investigate the frequency response of amplifiers.

CO5: Analyze the efficiency of power amplifiers like class-A, B, C, AB.

CO6: Design and verify some common electronic circuits.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	3	2	-	-	-	-	-	-	-	-	-	1	-	2
CO 2	2	3	2	-	-	-	-	-	-	-	-	-	1	-	2
CO 3	2	3	-	2	-	-	-	-	-	-	-	-	1	-	2
CO 4	2	3	2	-	-	-	-	-	-	-	-	-	1	-	2
CO 5	2	3	-	-	-	-	-	-	-	-	-	-	1	-	2
CO 6	3	3	-	2	2	-	-	-	2	2	2	2	2	-	2
Avg	**2.17**	**3.00**	**2.00**	**2.00**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**1.17**	**-**	**2.00**

16EC208 ANALOG COMMUNICATIONS

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Understand the concepts of modulation, demodulation and learn the basic amplitude modulation techniques.

CO2: Analysis of DSB-SC, SSB-SC and VSB-SC modulation and demodulation techniques.

CO3: Analyze the performance of different types of Angle Modulation Techniques for a given set of parameters.

CO4: Identify the transmitter and receiver types required for a given application.

CO5: Understand the calculation of SNR in different modulation techniques.

CO6: Experiment on different types of Analog communication subsystems using hardware and simulations.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	-	3	-	-	-	-	-	-	-	-	3	-	-
CO 2	2	3	-	3	-	-	-	-	-	-	-	-	3	-	-
CO 3	2	3	-	3	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	1	-	1	-	-	-	-	-	-	-	-	2	-	-
CO 5	2	2	-	3	-	-	-	-	-	-	-	-	2	-	-
CO 6	3	2	2	2	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.17**	**2.00**	**2.50**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**-**	**-**

16EC209 LINEAR CONTROL SYSTEMS

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Calculate the transfer function of different control systems.

CO2: Apply mathematical modeling to the physical systems/electrical systems.

CO3: Understand and analyze the characteristics of feedback systems.

CO4: Analyze the response of the open and closed loop systems with time domain and state space analysis.

CO5: Design lag, lead and lead-lag compensators and PID controllers.

CO6: Investigate the stability of a given control system by using RH, Root locus, Bode plot and Nyquist plot.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	1	-	-
CO 5	2	2	3	-	-	-	-	-	-	-	-	-	-	-	-
CO 6	2	3	-	3	-	-	-	-	-	-	-	-	2	1	2
Avg	**2.33**	**2.33**	**3.00**	**2.50**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.50**	**1.00**	**2.00**

16EC301 LINEAR IC's AND APPLICATIONS

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the characteristics and specifications of operational amplifiers.
CO2: Analyze operational amplifiers based circuits used for various applications.
CO3: Design various types of filters and regulators using operational amplifiers.
CO4: Understand and analyze the operation and applications of timer, phase locked loop and voltage controlled oscillators.
CO5: Understand data converters and OTA.
CO6: Design and verify some common electronic circuits using linear ICs.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2
CO 2	2	3	1	-	-	-	-	-	-	-	-	-	-	-	2
CO 3	2	2	3	1	-	-	-	-	2	-	-	-	2	-	2
CO 4	2	2	-	1	-	-	-	-	-	-	-	-	2	-	2
CO 5	2	2	1	-	-	-	-	-	-	-	-	-	2	-	2
CO 6	2	2	2	2	2	1	-	-	2	2	2	1	2	-	2
Avg	**2.00**	**2.17**	**1.75**	**1.33**	**2.00**	**1.00**	**-**	**-**	**2.00**	**2.00**	**2.00**	**1.00**	**2.00**	**-**	**2.00**

16EC302 MICROPROCESSORS AND MICROCONTROLLERS

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand and analyze the architectures of 8086 microprocessors and 8051 micro controllers.
CO2: Identify various peripheral interfaces to 8051:
CO3: Understand the architecture of ARM Processor.
CO4: Create basic assembly language programs for 8086, 8051 and ARM processors.
CO5: Experiment to interface various peripherals to 8051:
CO6: Develop applications based on different processors and controllers.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	3		2	-	-	-	-	-	-	-	-	-	2	-
CO 2	2	2	3	2	-	-	-	-	-	-	-	-	-	2	-
CO 3	3	2	-	-	-	-	-	-	-	-	-	-	-	2	-
CO 4	2	3	3	2	2	-	-	-	-	-	-	-	-	2	-
CO 5	2	3	3	2	2	-	-	-	2	2	-	2	-	3	-
CO 6	3	3	3	3	3	-	-	-	2	2	2	2	-	3	-
Avg	**2.33**	**2.67**	**3.00**	**2.20**	**2.33**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**-**	**2.33**	**-**

16EC303 DIGITAL COMMUNICATIONS

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Understand the models of digital communication systems and Information theory.

CO2: Describe and analyze digital pulse modulation techniques.

CO3: Analyze digital modulation schemes and understand the reception of digital signal.

CO4: Apply error control coding techniques for efficient communication.

CO5: Understand basic multiple access techniques for communications.

CO6: Experiment on different types of digital communication subsystems using hardware and simulations for a given application / problem statement

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 2	2	2	2	1	-	-	-	-	-	-	-	-	2	-	-
CO 3	2	3	-	1	-	-	-	-	-	-	-	-	2	-	-
CO 4	3	2	2	2	-	-	-	-	-	-	-	-	2	-	-
CO 5	2	1	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 6	3	3	3	3	3	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.17**	**2.33**	**1.75**	**3.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.17**	**-**	**-**

16EC304 ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Discuss the various electromagnetic quantities in spatial distribution by various co-ordinate systems.

CO2: Understand the concepts of electric field intensity and electric flux density due to various charge distributions and applications of Gauss's law.

CO3: Analyze the magneto-static for charge distributions and boundary conditions. CO4: Explain the Maxwell's Equations in integral and differential form.

CO5: Illustrate the concepts of electro-magnetic wave propagation, wave characteristics and poynting theorem.

CO6: Analyze the characteristics of transmission lines and solve the parameters using smith chart.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 2	3	2	2	2	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	2	2	-	-	-	-	-	-	-	-	2	-	-
CO 4	3	2	2	2	-	-	-	-	-	-	-	-	2	-	-
CO 5	3	2	2	1	-	-	-	-	-	-	-	-	2	-	-
CO 6	3	2	2	2	2	-	-	-	-	-	-	-	2	-	-
Avg	**3.00**	**2.00**	**2.00**	**1.80**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**-**	**-**

16EC305 COMPUTER ARCHITECTURE AND ORGANIZATION

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Understand the basic structure and operation of a digital computer.

CO2: Apply arithmetic algorithms and interpret the processed data.

CO3: Understand and analyze the concepts of CPU and its operations.

CO4: Categorize various memory mechanisms.

CO5: Understand and compare various data transfer techniques.

CO6: Understand the design of a pipelined, array and multiprocessors.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	-	-	-	-	-	-	-	-	-	-	1	-	2	-
CO 2	3	2	-	2	-	-	-	-	-	-	-	-	-	2	-
CO 3	3	-	-		-	-	-	-	-	-	-	-	-	2	-
CO 4	2	2	-	2	-	-	-	-	-	-	-	2	-	3	-
CO 5	3	2	-	2	-	-	-	-	-	-	-	2	-	3	-
CO 6	3	2	-	-	-	-	-	-	-	-	-	1	-	3	-
Avg	**2.83**	**2.00**	**-**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.50**	**-**	**2.50**	**-**

16EC306 VLSI DESIGN

Course Outcomes:

Upon successful completion of this lab course, students should be able to:

CO1: Analyze the operation and Electrical Behavior of MOS transistors. CO2: Understand the fabrication process of different MOS technologies.
CO3: Design VLSI circuits and Layouts of simple MOS circuit using Lambda based design rules.
CO4: Develop subsystems (digital circuits) using various logic methods and their limitations. (Minor project)
CO5: Model the combinational and sequential circuits using VHDL.
CO6: Synthesize the digital circuits with hardware description language/schematic levels.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO 2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CO 3	2	2	3	-	2	-	-	-	-	-	-	-	-	-	3
CO 4	2	1	3	-	-	-	-	-	-	-	-	-	-	-	3
CO 5	2	2	3	-	3	-	-	-	-	-	-	-	-	2	3
CO 6	2	2	3	3	3	-	-	-	2	2	2	2	-	-	3
Avg	**2.17**	**2.00**	**3.00**	**3.00**	**2.67**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**-**	**2.00**	**3.00**

16EC307 ANTENNA PROPAGATION

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Analyze the parallel plate waveguide and rectangular waveguides.
CO2: Understand the fundamental characteristics of antennas (gain, bandwidth, directivity etc.) in order to compute a wireless communication link.
CO3: Distinguish the characteristics of antenna such as radiation pattern, radiation efficiency, radiation intensity, antenna temperature.
CO4: Analyze different antenna arrays and patterns. CO5: Design the different antennas and properties.
CO6: Discuss the mechanism of the atmospheric effects on radio wave propagation.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	1	-	2	-	-	-	-	-	-	-	3	-	-
CO 2	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
CO 3	3	2	1	-	2	-	-	-	-	-	-	-	3	-	-
CO 4	2	2	3	2	2	-	-	-	-	-	-	-	3	-	-
CO 5	3	2	2	2	2	-	-	-	-	-	-	2	3	-	-
CO 6	2	2	-	-	-	-	2	-	-	-	-	1	3	-	-
Avg	**2.67**	**2.00**	**1.75**	**2.00**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**1.50**	**3.00**	**-**	**-**

16EC308 DIGITAL SIGNAL PROCESSING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO 2	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 5	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.40**	**3.00**	**2.25**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**2.00**	**-**

16EC401 OPTICAL COMMUNICATIONS

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the significance of optical communication and fundamental operating principles.
CO2: Estimate the signal distortion phenomena through various parameters like losses and pulse broadening.
CO3: Understand the principles and Analyze efficiencies of various optical sources.
CO4: Investigate the characteristics of different optical connectors.
CO5: Differentiate various optical detectors.
CO6: Understand and estimate link power budget and rise time budget.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 2	2	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 3	2	3	-	1	-	-	-	-	-	-	-	-	2	-	-
CO 4	2	1	-	3	-	-	-	-	-	-	-	-	2	-	-
CO 5	3	2	-	1	-	-	-	-	-	-	-	-	1	-	-
CO 6	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Avg	**2.50**	**2.00**	**-**	**1.75**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**-**	**-**

16EC402 MICROWAVE AND RADAR ENGINEERING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand and apply the concepts of scattering parameters to various microwave components.
CO2: Analyze microwave linear beam tubes.
CO3: Understand and analyze various microwave cross field devices like MAGNETRON, PIN, GUNN, IMPACTT, TRAPATT.
CO4: Perform various microwave measurements.
CO5: Evaluate the performance of different types of Radars.
CO6: Demonstrate the microwave bench setups and microwave components.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	2	-	2	-	-	-	-	-	-	-	3	-	-
CO 2	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO 3	3	3	2	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	2	-	-	-	-	-	-	-	-	-	-	3	-	-
CO 5	3	2	2	3	-	-	-	-	-	-	-	2	3	-	-
CO 6	3	2	2	2	2	-	2	-	2	2	-	2	3	-	-
Avg	**2.83**	**2.33**	**2.00**	**2.33**	**2.00**	**-**	**2.00**	**-**	**2.00**	**2.00**	**-**	**2.00**	**3.00**	**-**	**-**

16EC403 ELECTRONIC INSTRUMENTATION

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the fundamentals of static, dynamic characteristics and different errors used in the context of measuring instruments.
CO2: Classify various electro mechanical instruments.
CO3: Measure unknown impedance using AC and DC bridges.
CO4: Understand and analyze various signal generators and Spectrum analyzer.
CO5: Understand the working principles of various display devices and signal conditioning circuits.
CO6: Demonstrate the characteristics of various sensors.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	2
CO 2	3	2	-	-	-	-	-	-	-	-	-	-	2	2	2
CO 3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2
CO 4	2	3	-	-	-	-	-	-	-	-	-	-	2	1	2
CO 5	3	1	-	-	-	-	-	-	-	-	-	-	1	2	2
CO 6	2	2	3	2	2	-	-	-	2	2	2	2	-	2	2
Avg	**2.50**	**2.00**	**3.00**	**2.00**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**1.67**	**1.75**	**2.00**

16CS306 COMPUTER NETWORKS

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the basic concepts of Network hardware, software and reference models.
CO2: Learn different physical layer media and switching methods.
CO3: Identify various protocols involved in data link layer operations.
CO4: Analyze various design issues, protocols and functionalities of network layer.
CO5: Apply different protocols to perform end-to-end delivery and interaction with users.
CO6: Implement various protocols with modern tools.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	-	-	-	-	-	-	-	-	-	-	-	3	2	-
CO 2	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO 3	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 4	2	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO 5	3	1	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 6	3	2	3	2	3	-	-	-	2	2	2	2	3	-	-
Avg	**2.67**	**2.00**	**2.50**	**2.00**	**3.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.50**	**2.00**	**-**

16EC411 PROJECT WORK

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	2	3	2	-	-	2	2	2	3	3	3	3	3
CO 2	2	2	-	-	-	3	3	2	2	-	3	3	3	3	3
CO 3	-	-	-	-	-	2	2	3	2	2	3	2	3	3	3
CO 4	2	2	2	2	2	-	-	2	2	2	3	3	3	3	3
CO 5	2	1	2	2	3	1	2	2	2	2	3	2	3	3	3
CO 6	2	2	1	2	2	-	-	-	3	2	3	2	3	3	3
CO 7	3	2	3	2	2	2	2	2	2	2	3	2	3	3	3
Avg	**2.17**	**1.83**	**2.00**	**2.20**	**2.20**	**2.00**	**2.25**	**2.17**	**2.14**	**2.00**	**3.00**	**2.43**	**3.00**	**3.00**	**3.00**

16EC308 DIGITAL SIGNAL PROCESSING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO 2	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 5	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.40**	**3.00**	**2.25**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**2.00**	**-**

16EC308 DIGITAL SIGNAL PROCESSING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO 2	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 5	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.40**	**3.00**	**2.25**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**2.00**	**-**

16EC308 DIGITAL SIGNAL PROCESSING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO 2	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 5	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.40**	**3.00**	**2.25**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**2.00**	**-**

16EC308 DIGITAL SIGNAL PROCESSING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO 2	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 5	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.40**	**3.00**	**2.25**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**2.00**	**-**

16EC308 DIGITAL SIGNAL PROCESSING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO 2	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 5	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.40**	**3.00**	**2.25**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**2.00**	**-**

16EC308 DIGITAL SIGNAL PROCESSING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO 2	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 5	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.40**	**3.00**	**2.25**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**2.00**	**-**

16EC308 DIGITAL SIGNAL PROCESSING

Course Outcomes:

Upon successful completion of this course, students should be able to:
CO1: Understand the generations and basic concepts of Digital Signal Processor architecture.
CO2: Understand the basics of discrete time signals and systems.
CO3: Apply the concepts of transform techniques in realizing discrete time signals.
CO4: Analyze various transform properties for discrete time signals.
CO5: Design of analog and digital Filters for a given specification.
CO6: Verify various transform techniques and filters.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO 2	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 4	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO 5	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO 6	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
Avg	**2.33**	**2.40**	**3.00**	**2.25**	**2.00**	**-**	**-**	**-**	**2.00**	**2.00**	**2.00**	**2.00**	**2.67**	**2.00**	**-**

16EC412 INTERNSHIP

Course Outcomes:

Upon successful completion of this course, students should be able to:

CO1: Survey in independent study to literature in the identified domain.

CO2: Identify the community that shall benefit through the solution to the identified engineering problem and also demonstrate concern for environment.

CO3: Demonstrate compliance to the prescribed standards/ safety norms through implementation of the identified engineering problem.

CO4: Plan independent study mathematical concepts, science concepts, engineering concepts necessary to solve the identified engineering problem.

CO5: Make use of available engineering tools that may be used for solving the identified engineering problem.

CO6: Function in the team, contribute to the team and lead the team.

CO7: Apply the identified concepts and engineering tools to arrive at design solutions for the identified engineering problem.

Course Outcomes with Program Outcomes and Program Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	2	3	2	-	-	2	2	2	3	3	3	3	3
CO 2	2	2	-	-	-	3	3	2	2	-	3	3	3	3	3
CO 3	-	-	-	-	-	2	2	3	2	2	3	2	3	3	3
CO 4	2	2	2	2	2	-	-	2	2	2	3	3	3	3	3
CO 5	2	1	2	2	3	1	2	2	2	2	3	2	3	3	3
CO 6	2	2	1	2	2	-	-	-	3	2	3	2	3	3	3
CO 7	3	2	3	2	2	2	2	2	2	2	3	2	3	3	3
Avg	**2.17**	**1.83**	**2.00**	**2.20**	**2.20**	**2.00**	**2.25**	**2.17**	**2.14**	**2.00**	**3.00**	**2.43**	**3.00**	**3.00**	**3.00**