SHRI G. S. INSTITUTE OF TECHNOLOGY AND SCIENCE

ELECTRONICS & INSTRUMENTATION DEPARTMENT

BE II Year (4 YDC) Semester A

SUBJECT CODE: EI-27001

SUBJECT NOMENCLATURE: CIRCUIT ANALYSIS AND SYNTHESIS

Course Outcomes:-

CO1: Discussed and enhanced the knowledge about circuits analysis and synthesis by applying KVL and KCL.

CO2: Identify the circuit‘s topology to reduce complexity.

CO3: Apply the knowledge of Fourier series and Laplace Transform for circuit analysis.

CO4: Determine the solutions for differential equations for circuit analysis.

CO5: Understanding the concept of transient and steady state response of electrical circuits. Also the knowledge about Applicability of Foster and Cauer forms.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1		1	1						1
CO2	3	1	2									
CO3	3	2	2									
CO4	3	3	3	1	1	1						
CO5	2	1	2	1								
AVG.	2.8	1.8	2	1	1	1						1

SUBJECT CODE: EI-27002

SUBJECT NOMENCLATURE: FUNDAMENTALS OF MEASUREMENT

Course Outcomes:

CO1: To discuss fundamentals of measuring instruments theoretically as well as practically.

CO2: To determine Cathode ray oscilloscope in detail with its applications and probe compensation.

CO3: Attain basic knowledge about Analog instruments.

CO4: Description of measurement of low resistances, voltage, current, phase frequency etc.

CO5: To implement compensation, calibration and testing of measuring instruments.

CO6: Gain knowledge about A.C. bridges and its applications.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2									
CO2	3	2	3		2							
CO3	3	2	1	3					2			
CO4	3	3	3	2	2		2					
CO5	2	2	3	2	1				2			
CO6	3	3	3	2	2							
AVG.	2.8	2.3	2.5	2.3	1.8		2		2			

SUBJECT CODE: EI-27003
SUBJECT NOMENCLATURE: ELECTRONIC DEVICES AND CIRCUITS

Course Outcomes:

CO1: To determine basic semiconductor theory and types of semiconductors devices.
CO2: To determine current transport in semiconductor and the working principle of diodes and bipolar transistor.
CO3: To apply the modelling of diode, BJT, MOS.
CO4: To discuss fabrication techniques for integrated circuits.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2									
CO2	3	3	2	2								
CO3	2	2	3	1								
CO4	3	3	2									
AVG.	2.75	2.25	2.25	1.5								

SUBJECT CODE: MA-27014
SUBJECT NOMENCLATURE: MATHEMATICS-III

Course Outcomes:

CO1: Learn advance calculus.
CO2: Understand Fourier series, partial differential equation and their applications in Engg.
CO3: Learn Laplace & Fourier transforms & their applications in Electronics circuit analysis, communication & control systems.
CO4: Learns calculus for finite differentiation and its applications.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3									3
CO2	3	3	3									3
CO3	3	3	3									3
CO4	3	3	3									3
AVG.	3	3	3									3

SUBJECT CODE: HU-27005

SUBJECT NOMENCLATURE: ECONOMICS FOR ENGINEERS

COURSE OUTCOMES: after completion of course, the students will be able to:

1. Explain economic cyclic flow and Estimate the demand and demand elasticity for a product.
2. Plan the production; choose appropriate production technology (combination of production factors); and estimate feasible range of production.
3. Analyze the production-cost-profit relation and select the suitable project for investment
4. Estimate price and the equilibrium for a firm/organization in different competitive market situations.
5. Review, summarize and compare the financial statements of an accounting entity and able to apply financial ratio technique for financial analysis.
6. Identify the problems, see the opportunity, and ideate the solution to the problems

SUBJECT CODE: EI-27498

SUBJECT NOMENCLATURE: ELECTRONIC WORKSHOP

Course Outcomes:

CO1: To identify about basic electronic component.
CO2: To apply colour coding scheme for resistance (Band 4, Band 5 & band 6)
CO3: To implement methodology for designing PCB (Etching, Drilling & Soldering)
CO4: To become familiar with fundamental electronic circuits.

CO	P0 1	P0 2	P0 3	P0 4	P0 5	P0 6	P0 7	P0 8	P0 9	P0 10	P0 11	P0 12
CO 1	3	3	2	1	3							
CO 2	3	2	1	1	2							
CO 3	3	2	1	1	2							
CO 4	3	2			3							1
Average PO	**3**	**2.25**	**1.333**	**1**	**2.5**							**1**

SUBJECT CODE: OC-I

SUBJECT NOMENCLATURE: INSTRUMENTATION WORKSHOP

Course Outcomes:

CO1: To study basic introduction of electronic hardware systems and provides hands-on training with familiarization.
CO2: To implement the circuits on PCB and test it with CRO, Function generator and multimeter.
CO3: Testing of electronics components.
CO4: soldering practice and assembling of electronics circuits.

CO	P0 1	P0 2	P0 3	P0 4	P0 5	P0 6	P0 7	P0 8	P0 9	P0 10	P0 11	P0 12
CO 1	3	3	2	1	3							
CO 2	3	2	1	1	2							
CO 3	3	2	1	1	2							
CO 4	3	2			3							1
Average PO	**3**	**2.25**	**1.333**	**1**	**2.5**							**1**

BE II Year (4 YDC) Semester B

SUBJECT CODE: EI-27501
SUBJECT NOMENCLATURE: ANALOG ELECTRONICS

Course Outcomes:

CO1: To discuss the frequency response & gain calculation of single/double stage amplifiers.
CO2: To apply the fundamentals of feedback amplifier & oscillators.
CO3: To analyse the theory behind Op-amp & application in technology.
CO4: Descriptive view about Op-amp IC's like 74,324,308 etc.
CO5: To discuss RFICs & review of regulators using Zener diodes, series and shunt regulators
CO6: To describe the role of Multivibrators.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3				2	2	3			1		2
CO2	3	3	2		3	1	2					1
CO3	3			2	2	2				3		2
CO4	3	1	3		3	2				2		3
CO5	3	3	3	3	1	3				2		2
CO6	3		2	1	1		2					3
AVG.	3	2.33	2.5	2	2	2	2.33			2		2.16

SUBJECT CODE: EI-27551
SUBJECT NOMENCLATURE: SENSORS& TRANSDUCERS

Course Outcomes:-

CO1: To discuss role of Sensor and transducers in instrumentation
CO2: Descriptive view for the transducer construction, classification, principle of operation and characteristics.
CO3: Gain knowledge about transducers for measurement of displacement, strain, velocity, acceleration etc.
CO4: To analyze transducers for measurement of pressure and force.
CO5: To discuss about bimetallic and temperature measurement system.
CO6: To discuss about transducers for flow and level measurement.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3		1	2						
CO2	3	2	2			2						
CO3	3	2	1									
CO4	3	3	2									
CO5	3	3	2	1								
CO6	3	2	2	1								
AVG.	3	2.5	2	1	1	2						

SUBJECT CODE: EI-27562
SUBJECT NOMENCLATURE: DIGITAL ELECTRONICS

Course Outcomes:

CO1: To apply the Boolean algebra with its postulates- laws, expressions & minimization techniques.
CO2: To discuss the role of logic gates in digital electronics.
CO3: To apply combinational logics and circuits.
CO4: To gain the knowledge of sequential circuits with their implementations.
CO5: To adapt with memory classification and devices.
CO6: To implement asynchronous and synchronous circuits fall under digital electronics.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2						1	1		
CO2	3	2	3						1	1		
CO3	3	3	2						1	1		
CO4	3	3	2						1	1		
CO5	3	2	1						1	1		
CO6	3	2	2						1	1		
AVG.	3	2.5	2						1	1		

SUBJECT CODE: MA -27563
SUBJECT NOMENCLATURE: MATHEMATICS-IV

Course Outcomes:-

CO1: Learn functioning of complex variables.
CO2: Understand statistics & probability & their applications.
CO3: Learn reliability & its applications in electronics system.
CO4: Understand graph theory & optimization.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3									3
CO2	3	3	3									3
CO3	3	3	3									3
CO4	3	3	3									3
CO5	3	3	3									3
AVG.	3	3	3									3

SUBJECT CODE: EI-27992

SUBJECT NOMENCLATURE: SOFTWARE WORKSHOP

Course Outcomes:-

CO1: To implement the MATLAB Desktop, Command window and the Graph Window

CO2: Be able to do simple and complex calculation using MATLAB

CO3: Be able to carry out numerical computations and analyses

CO4: To apply the mathematical concepts upon which numerical methods.

CO5: Todiscuss the tools that are essential in solving engineering problems

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	3	1	2	3	2	3	3
CO2	3	3	3	3	3	2	1	2	3	2	2	2
CO3	3	3	3	2	3	2	1	2	3	3	3	2
CO4	3	3	3	3	3	2	2	2	3	2	2	3
CO5	3	3	3		3	2	2	3	3	2	3	3
AVG.	3	3	3	2.75	3	2.2	1.4	2.2	3	2.2	2.6	2.6

SUBJECT CODE: HU-27881

SUBJECT NOMENCLATURE: VALUES, HUMANITIES & PROFESSIONAL ETHICS

COURSE OUTCOMES:

1. Explain and elaborate the social institutions and Constitution of India through which the society and nation is governed.
2. Describe the kinds of values and ethics and their importance
3. Contextualize the professional attitude and approaches as per needs of society and values.
4. Explain and illustrate the process of Social, Political and Technological changes incontext to global changes

BE IIIYear (4 YDC) Semester A

SUBJECT CODE: IT-37005

SUBJECT NOMENCLATURE: DATA STRUCTURE

Course Outcomes:

CO1: Understand data structure stack queues, lists, trees, complexity etc. in detail.

CO2: Study memory hierarchy, management techniques partitioning, segmentation, paging and comparison of techniques.

CO3: Gain knowledge about CPU scheduling and multiprogramming

CO4: Understand file systems and Input / Output operations.

CO5: Case studies on MS-DOS, UNIX and WINDOWS NT.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	-	-	-	-	-	-	-	1
CO2	3	3	1	2	2	-	-	-	-	-	-	1
CO3	3	3	2	2	-	-	-	-	-	-	-	1
CO4	3	2	2	-	-	-	-	-	-	-	-	1
CO5	3	2	2	-	-	-	-	-	-	-	-	1
AVG.	3	2.4	1.6	2	2							1

SUBJECT CODE: EI-37006
SUBJECT NOMENCLATURE: MICROPROCESSOR SYSTEMS

CO1: To describe the evolution and organization of microprocessors and microcomputers along with its basic architecture and register set.
CO2: Evaluate different techniques of memory interfacing and I/O devices.
CO3: Develop knowledge about interfacing devices and peripheral sub-systems.
CO4: Gain knowledge about Analog and Digital sub-systems with data converters.
CO5: Developing skills of designing assembly language programming of microprocessors.
CO6: To discuss various practical applications of microprocessor system.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	--	--	--	2	2	3	--	--	1	--	2
CO2	3	3	2	--	3	1	2	--	--	--	--	1
CO3	3	--	--	2	2	2	--	--	--	3	--	2
CO4	3	1	3	--	3	2	--	--	--	2	--	3
CO5	3	3	3	3	1	3	--	--	--	2	--	2
	3	--	2	1	1	--	2	--	--	--	--	3
AVG.	3	2.3	2.5	2	2.4	2	2.3			2		2.6

SUBJECT CODE: EE -37003
SUBJECT NOMENCLATURE: CONTROL SYSTEM- SEMESTER 'A'
Course Outcomes

EE37003(T).1: Understand the dynamic systems and analyze mathematical modelling of physical systems such as Electrical, Mechanical, Thermal and Hydraulic.

EE37003(T).2: Evaluate the time domain and frequency domain design specifications of the system and error dynamics of first and second order systems with various inputs.

EE37003(T).3: Application of frequency domain analysis for ascertaining stability in time and frequency domain using Routh Hurwitz analysis, Root Locus, Nyquist and Bode Plots.

EE37003(T).4: Designing of Lead, Lag and Lead-Lag compensators for desired frequency domain closed loop performance, Designing of PID Controllers.

EE37003(T).5: Understanding the concept of controllability and Observability by state space analysis, State feedback Controller design with Pole Placement.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	2	2	1	--	--	--	--	--	--	--
CO2		3	2	2		--	--	--	--	--	--	--
CO3		3	2	2	1	--	--	--	--	--	--	--
CO4			2	2	1	--	--	--	--	--	--	--
CO5		3			1	--	--	--	--	--	--	--
AVG.	1	3	2	2	1							

SUBJECT CODE: EC-37014 SUBJECT NOMENCLATURE: ANALOG AND DIGITAL COMMUNICATION

Course Outcomes:-

CO1: Understand mathematical representation of signals.
CO2: Various transmission schemes used in analog& digital communication.
CO3: Designing a communication system sub parts.
CO4: Performance comparison of various analog& digital communications.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	--	--	--	--	--	--	--	--	--	--
CO2	2	1	2	2	1	--	--	--	--	--	--	1
CO3	2	2	3	2	1	--	--	--	--	1	--	2
CO4	--	--	2	1	1	--	--	--	--	--	--	2
AVG.	2.3	1.3	2.3	1.6	1					1		1.6

SUBJECT CODE: EI-37251

SUBJECT NOMENCLATURE: ELECTIVE 1(INDUSTRIAL ENGINEERING & MANAGEMENT)

Course Outcomes:-

CO1: Learn work place design, work measurement tests & technology.
CO2: Understand concept of operations & organization management.
CO3: Learn operational research, linear programming, transportation models and its applications.
CO4: Apply and learn quality control & its economics.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	2	1			3	1	3	3
CO2	2	3	2	2	2			2	2	1	3	2
CO3	3	3	2	3	3				3		3	1
CO4	2	2		2	3				2	1	3	2
AVG.	2.5	2.5	2	2.25	2.5	1		2	2.5	1	3	2

SUBJECT CODE: EI-37252 SUBJECT NOMENCLATURE: ELECTIVE 1(INSTRUMENT SYSTEM DESIGN)

Course Outcomes:

CO1: To work on PCB designing software‘s.
CO2: To design Microcontroller based electronic circuit
CO3: To interpret data sheets & specifications of various logic families & IC‘s

SUBJECT CODE: EI 37481 SUBJECT NOMENCLATURE: TEST & CALIBRATION LABORATORY

COURSE OUTCOME:

CO1. Learn the static and Dynamic Charateristics of Measurement System
CO2:: Understand concept of testing of Measuring equipments
CO3: Analyzing the errors of electronic Equipments
CO4: Apply and learn the calibration of test Equipments

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1									
CO2	1	1	1	--	--	--	--	--	--	1	2	1
CO3	--	--	3	3	1	2	--	--	1	2	3	2
CO4	--	1	1	3	2	3	--	--	3	2	3	2
AVG.	1	1.6	1.5	3	1.5	2.5			2	1.6	2.6	1.6

SUBJECT CODE: EI-OC-III SUBJECT NOMENCLATURE: ANALYTICAL INSTRUMENTATION

Course Outcomes:

1. To provide various techniques and methods of analysis which occur in the various regions of t he spectrum.
2. To give unique methods of separation of closely similar materials, the most powerful being gaschromatography
3. To discuss important methods of analysis of industrial gases. Awareness and control of pollution in the environment is of vital importance.

BE III Year (4 YDC) Semester B

SUBJECT CODE: EI-37511 SUBJECT NOMENCLATURE: FILTER DESIGN AND SIMULATION

Course Outcomes:-

CO1: To discuss various active network elements, control sources and properties of GIC, Nic, gyrators using Op-amp.
CO2: Evaluation of elliptical filters and fundamentals of approximation theory.
CO3: To implement realization of Butterworth filters of first order and second order using Op-amp
CO4: Analyzing active networks using IAM approach and its implementation.
CO5: To discuss LC ladder simulation, cascade realization, Kerwins circuit and other filter circuits and its simulation.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	1	--	--	--	--	--	--	--
CO2	2	3	2	2	1	--	--	--	2	--	--	--
CO3	3	2	3	1	1	--	--	--	1	--	--	--
CO4	2	2	3	1	1	--	--	--	1	--	--	--
CO5	2	2	1	1	--	--	--	--		--	--	--
AVG.	2.4	2.2	2.2	1.2	1				1.33			

SUBJECT CODE: ME-37502
SUBJECT NOMENCLATURE: MECHANICAL MEASUREMENTS

Course Outcomes:

CO1: Learn the types of measurement, errors & their analysis.
CO2: Understand principle of mechanical measurement, electrical, optical etc.
CO3: Measurement of quantities like force, torque, vibration, shock, sound etc.
CO4: Mechanical elements like dampers, flappers, nozzles, valves etc.

SUBJECT CODE: EI-37513
SUBJECT NOMENCLATURE: HIGH FREQUENCY ENGINEERING

Course Outcomes:

CO 1: To describe Maxwell's equation & wave equation & their interpretation.
CO 2: To discuss concepts of waves.
CO 3: Gain knowledge of transmission lines & waveguides.
CO 4: To discuss working and operation of high frequency components like magnetron, klystron, TWT.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	--	--	--	--	--	--	--	--
CO2	3	2	2	1	--	--	--	--	--	--	--	--
CO3	3	3		2	1	--	--	--	--	--	--	--
CO4	3	3	3	2	3	--	--	--	--	--	--	--
AVG.	3	2.75	2.3	2	2							

SUBJECT CODE: EC-37512

SUBJECT NOMENCLATURE: DIGITAL SIGNAL PROCESSING

CourseOutcomes:-

CO1:Learn characteristics of signals &systems like time invariant,linear nonlinear,causal etc.
CO2: Gain knowledge of Z-transform & analyzing discrete system using Z-transform.
CO3: Evaluation of DFT and FFT
CO4: Realization and Implementation of digital Filters.
CO5:Designing digital filters& their implementation.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2		--	--	--	1	--	--	--
CO2	3	3	3	3	1	--	--	--	2	--	--	--
CO3	3	3	3	3	1	--	--	--	2	3	2	2
CO4	3	3	3	3	1	--	--	--	2	3	2	2
CO5	3	3	3	3	1	--	--	--	2	3	2	2
AVG	3	3	2.8	2.8	1				1.8	3	2	2

SUBJECT CODE: EI-37701 SUBJECT NOMENCLATURE: MICROCONTROLLER & EMBEDDED SYSTEM (ELECTIVE -I)

Course Outcomes:

CO 1: Analyze the basic concepts and architecture associated with different microcontrollers Families.
CO 2: Descriptive view about 8051 family of microcontrollers and designing assembly language programs for Different scenarios and calculations.
CO 3: Illustration of different devices interfacing with 8051 microcontroller.
CO 4: Brief overview of Motorola series microcontrollers.
CO 5: Evaluation of embedded system, its characteristics and applications by using few case studies.
CO6: To discuss various software architecture of embedded systems.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1											1	
CO2	2	1	2	2	1	1		1	1	2	2	
CO3							1	1		2	1	1
CO4												
CO5	2	2	3	2	1	1	2	1	1	2	2	1
CO6	1			1								
AVG	1.6	1.5	2.5	1.6	1	1	1.5	1	1	2	1.5	1

BE IV Year (4 YDC) Semester A

SUBJECT CODE: EI-47053
SUBJECT NOMENCLATURE: PROCESS INSTRUMENTATION

Course Outcomes:

CO1: To Analyse process control system and evaluation.
CO2: Application of pneumatic and electronic controller in control systems.
CO3: To describe PLC and ladder programming for designing various logics.
CO4: To discuss final control elements
CO5: Toe employ PLC and ladder programming to real world scenario.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1	2			1				1	1
CO2				3	2						1	1
CO3					1							
CO4												
CO5			2	3	3	1	1				2	
AVG			1.5	2.6	2	1	1				1.33	2

SUBJECT CODE: EI-47055/EI-47655/EI4755
SUBJECT NOMENCLATURE: VLSI DESIGN

Course Outcomes:

CO1: Illustration of VLSI design flow for PLD based system.
CO2: Discussion about HDLs and its features and introduction to VHDL.
CO3: Develop skills of designing digital circuit using different HDLs.
CO4: Examine different case studies of Xilinx 4000/3000 series FPGA.
CO5: To discuss CMOS, its characteristics and different logic circuits.
CO6: To discuss the basics of VLSI design and implementation of logic functions on basis of different properties such as rise/fall/delay time, fan-in, fan-out etc.
CO7: To describe FSM design using Mealy and Moore machines.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	--	3	--	--	--	--	--	--	--
CO2	3	2	1	1	3	--	--	--	--	--	--	--
CO3	3	3	3	3	3	2	--	--	--	--	2	2
CO4	3	--	--	--	3	--	--	--	--	--	--	2
CO5	3	1	--	2	3	2	--	--	--	--	2	2
CO6	3	3	3	2	3	--	--	--	--	--	--	3
CO7	3	1	2	--	3	--	--	--	--	--	--	--
AVG	3	1.8	1.8	2	3	2					2	2.5

SUBJECT CODE: EE-47002
SUBJECT NOMENCLATURE: POWER ELECTRONICS

COURSE OUTCOMES:

EE47002(T).1: Acquire knowledge about fundamental concepts and switches used in power electronics
EE47002(T).2: Ability to analyze various single phase and three phase line commutated power converter circuits and understand their applications.
EE47002(T).3: Nurture the ability to identify basic requirements for line commutated converter based design application.
EE47002(T).4: To develop skills to build, and troubleshoot power electronics circuits.
EE47002(T).5: Understand the firing circuit design for line commutated converters
EE47002(T).6: Foster ability to understand the use of line commutated converters in professional engineering.

SUBJECT CODE: EI-47257
SUBJECT NOMENCLATURE: FIBER OPTICS & PHOTONICS (ELECTIVE-I)

Course Outcomes:-

CO1: To discuss optical fiber and its types with its advantages and disadvantages. CO2: Gain knowledge about optical instrumentation.
CO3: Descriptive view about optical communication and break-through in optical network design. CO4: Illustration of optoelectronics, lasers and band-gap engineering

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	--	--	--	--	--	--	--	--	1
CO2	3	2	1	--	--	--	--	--	--	--	--	2
CO3	2	2	3	--	--	--	--	--	--	--	--	3
CO4	2	1	3	--	--	--	--	--	--	--	--	1
AVG	2.5	2	2.25									1.75

SUBJECT CODE: XX47201
SUBJECT NOMENCLATURE: DATA STRUCTURES (ELECTIV-I)

Course Outcomes:

CO1: Understand data structure stack queues, lists, trees, complexity etc. in detail.
CO2: Study memory hierarchy, management techniques partitioning, segmentation, paging and comparison of techniques.
CO3: Gain knowledge about CPU scheduling and multiprogramming CO4: Understand file systems and Input / Output operations.
CO5: Case studies on MS-DOS, UNIX and WINDOWS NT.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	-	-	-	-	-	-	-	1
CO2	3	3	1	2	2	-	-	-	-	-	-	1
CO3	3	3	2	2	-	-	-	-	-	-	-	1
CO4	3	2	2	-	-	-	-	-	-	-	-	1
CO5	3	2	2	-	-	-	-	-	-	-	-	1
AVG.	3	2.4	1.6	2	2							1

SUBJECT CODE: EI-47322
SUBJECT NOMENCLATURE: VLSI TECHNOLOGY (ELECTIVE-II)

Course Outcomes:-

CO1: To describe crystal growth and wafer preparation methods. CO2: To discuss layering in terms of chip fabrication.
CO3: Illustration of various patterning methods.
CO4: Gain knowledge about layout design rules, stick diagrams etc. CO5: Illustration of subsystem design and memories.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				2								1
CO2				2	3	1	2	3	1	1	2	1
CO3				3	3	1					2	
CO4	2	1	2		1	1				2	3	2
CO5	2	2	3	3	2	2	3	2	3	2	3	1
AVG	2	1.5	2.5	2.5	2.25	1.25	2.5	2.5	2	1.6	2.5	1.25

SUBJECT CODE: EI-47301

SUBJECT NOMENCLATURE: INTELLIGENT INSTRUMENTATION (ELECTIVE- II)

Course Outcomes:-

CO1: To discuss concepts of robotics, robot mechanism and its classification. CO2: To describe mechanical and electrical elements involved in robotics.
CO3: Practical analysis of robotic mechanism and its functioning at different abstraction levels.
CO4: Designing of smart systems and its study in terms of interfacing and intelligent instrumentation.
CO5: To discuss real time systems and its scheduling.
CO6: Evaluation of expert system for real time control applications.
CO7: Brief overview of artificial intelligence and its requirement in instrumentation.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1							
CO2	3	3	3	3								
CO3	3	3	3	3	2	2	2					2
CO4	3	2	3	2	2	1	1					3
CO5	3	2	2	2	2	2						
CO6	2	2	2	2	2							2
CO7	3	3	2	2	2							2
AVG	3	2.57	3	2.28	1.57	0.71	0.4					1.28

SUBJECT CODE: BM-470012
SUBJECT NOMENCLATURE: MEDICAL INSTRUMENTATION (ELECTIVE-III)

Course Outcomes:

CO1: Introduction to general human physiology.
CO2: Illustration of measurement of physiological signals from detection to display. CO3: Understand theory and design aspects of different therapeutic equipments.
CO4: Practical analysis of different therapeutic equipments.
CO5: Gain knowledge about advanced microprocessor and PC based biomedical instruments.
CO6: Perform the analytical experiments; improve analytical skills and attitude which help them to apply these skills in their field of engineering.
CO7: Understand different analytical techniques

BE IV Year (4 YDC) Semester B

SUBJECT CODE: EI-47601 SUBJECT NOMENCLATURE: DIGITAL IMAGE PROCESSING (ELECTIV-III)

Course Outcomes:

CO1: Understand the fundamentals of image processing. CO2: Study of various image transform.
CO3: Study of different filters used in image processing. CO4: Different types of image reconstruction process.
CO5: Study of coding and algorithms

SUBJECT CODE: EI-47602
SUBJECT NOMENCLATURE: COMPUTER NETWORKS (ELECTIV-III)

Course Outcomes:-

CO 1: To Analyse the concepts of networks, types and architectures.
CO2: To Identify error free transmission of data and analyse data collisions with various

protocols CO3: To Apply various routing algorithms over a network to provide optimal path
CO4: Illustrate the real time applications of networks.
CO5: Examine the addressing entities of a network with implementation of TCP, UDP protocols.

SUBJECT CODE: EI-47776
SUBJECT NOMENCLATURE: AUTOMATION IN INSTRUMENTATION (ELECTIV-IV)

Course Outcomes:-

CO1: Introduction to automation its types and application in instrumentation.
CO2: Develop a good sense of understanding towards computerized automation based instrumentation industry.
CO3: Illustrate the concepts of Microcomputer based numerical control system.
CO4: To analyse evolution of electronic system and instrumentation in terms of automation.
CO5: Illustrate the concepts of Virtual instrumentation with a few case studies.

CO – PO ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	--	--	--	--	--	--	--	--	1
CO2	2	3	2	1	--	--	--	--	--	--	--	2
CO3	2	3	1	1	--	--	--	--	--	--	--	1
CO4	2	3	1	3	--	--	--	--	--	--	--	1
CO5	1	3	3	2	--	--	--	--	--	--	--	3
AVG	2	2.8	1.6	1.75	--	--	--	--	--	--	--	1.6

SUBJECT CODE: EI-47701
SUBJECT NOMENCLATURE: DATA ACQUISITION SYSTEM (ELECTIVE-IV)

Course Outcomes:

CO1: Review of Fundamentals of Data Acquisition System.
CO2: Data Acquisition Systems: Hardware & software.
CO3: To discuss about Power Management & Timing System.
CO4: Review of Analog and Digital Signal Processing.
CO5: Design of Data Acquisition Systems.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1							2	
CO2	3	3	3	1	3	2					3	
CO3	3	3	2	3		3	3				2	3
CO4	3	3	1	1							1	
CO5	3	3	3	3	3	2					3	3
AVG	3	2.8	2.5	1.8	3	2.33	3				2.2	2