BHARATI VIDYAPEETH'S COLLEGE OF ENGINEERING
(Approved by AICTE, New Delhi & Affiliated to Guru Gobind Singh Indraprastha University, Delhi)
(An ISO 9001:2015 Certified Institution)
A-4, Paschim Vihar, Main Rohtak Road, New Delhi – 110 063
Department: Instrumentation and Control Engineering

Semester: III

BHARATI VIDYAPEETH'S COLLEGE OF ENGINEERING

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Department: Instrumentation and Control Engineering

Paper Code: ES-201												
Paper: Computational Methods												
Course Outcomes (CO)												
CO 1	Ability to develop mathematical models of low-level engineering problems											
CO 2	Ability to apply interpolation methods and numerical integration.											
CO 3	Ability to solve simultaneous linear equations and curve fitting by splines											
CO 4	Ability to numerically solve ordinary differential equations that are initial value or boundary value problems											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	3	2	2	2	2	-	-	-	2	2	2	3
CO 2	3	2	2	2	2	-	-	-	2	2	2	3
CO 3	3	3	3	3	2	-	-	-	2	2	2	3
CO 4	3	3	3	3	2	-	-	-	2	2	2	3

Paper Code: HS-203												
Paper: Indian Knowledge System												
Course Outcomes (CO)												
CO 1	Ability to understand the Indian knowledge System.											
CO 2	Ability to understand and apply foundational concepts for science and technology.											
CO 3	Ability to understand and apply ancient Indian mathematics and astronomy											
CO 4	Ability to understand ancient Indian engineering and technology.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	-	-	-	-	-	3	-	-	-	-	-	2
CO 2	-	-	-	-	-	3	-	-	-	2	-	2
CO 3	3	3	-	-	-	-	-	-	-	-	-	2
CO 4	3	3	-	-	-	-	-	-	-	-	-	2

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Department: Instrumentation and Control Engineering

Paper Code(s): ICC-205												
Paper: Engineering Electromagnetics												
Course Outcomes (CO)												
CO 1	To understand the basic laws of electromagnetism.											
CO 2	To provide solution of real life plane wave problems for various boundary conditions and analyse the field equations for the wave propagation in special cases.											
CO 3	Understand the characteristics and carryout impudence transformation on high frequency transmission lines.											
CO 4	Analyze wave propagation on metallic waveguides in modal form.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	3	3	3	3	2	1	1	-	2	1	-	2
CO 2	3	3	3	3	2	1	1	-	2	1	-	2
CO 3	3	3	3	3	2	1	1	-	2	1	-	2
CO 4	3	3	3	3	2	1	1	-	2	1	-	2

Paper Code: ECC-207												
Paper: Digital Logic and Computer Design												
Course Outcomes (CO) :												
CO 1	Ability to understand Boolean Algebra and Design Combinational Circuits .											
CO 2	Ability to understand and Design Sequential Circuits.											
CO 3	Ability to understand Design of a basic computer.											
CO 4	Ability to understand Input-Output and Memory Organization of a Computer.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	3	2	3	2	2	-	-	-	3	2	2	3
CO 2	3	2	3	2	2	-	-	-	3	2	2	3
CO 3	3	2	3	3	2	-	-	-	3	2	2	3
CO 4	3	3	3	3	3	-	-	-	3	2	2	3

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Department: Instrumentation and Control Engineering

Paper Code: EEC-213	
Paper: Circuits and Systems	
Course Outcomes (CO)	
CO 1	Ability to understand properties of signal and system.
CO 2	Ability to determine transient respond of circuit.
CO 3	Ability to solve AC circuit.
CO 4	Ability to determine two port parameter and transfer function.

Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	3	3	3	3	2	-	-	-	1	1	1	1
CO 2	3	3	3	3	2	-	-	-	1	1	1	1
CO 3	3	3	3	3	2	-	-	-	1	1	1	1
CO 4	3	3	3	3	2	-	-	-	1	1	1	1

Paper Code(s): ECC-219	
Paper: Analog Electronics	
Course Outcomes (CO)	
CO 1	Ability to understand working and application of various Diodes.
CO 2	Ability to analyse various amplifier circuits.
CO 3	Ability to understand working and applications of operational amplifier.
CO 4	Ability to analyse different waveform generators.

Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	2	2	2	2	1	2	1	-	2	2	-	3
CO 2	3	3	2	2	1	2	1	-	2	2	-	2
CO 3	2	2	1	2	1	2	1	-	2	2	-	2
CO 4	2	2	2	2	1	2	1	-	2	2	-	2

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Department: Instrumentation and Control Engineering

Semester: IV

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A-4, Paschim Vihar, Main Rohtak Road, New Delhi – 110 063

Department: Instrumentation and Control Engineering

Paper Code(s): BS-202

Paper: Probability, Statistics and Linear Programming

Course Outcomes (CO):

CO1:	Ability to solve probability problems and describe probability distributions.
CO2:	Ability to describe and summarize data.
CO3:	Ability to use test for hypothesis.
CO4:	Ability to formulate and solve linear programming problems.

Course Outcomes (CO to Programme Outcomes (PO) Mapping (scale 1: low, 2: Medium, 3: High

CO/PO	*PO01*	*PO02*	*PO03*	*PO04*	*PO05*	*PO06*	*PO07*	*PO08*	*PO09*	*PO10*	*PO11*	*PO12*
CO1	-	3	1	1	1	-	-	-	-	-	1	2
CO2	-	3	1	1	1	-	-	-	-	-	1	2
CO3	-	3	2	2	1	-	-	-	-	-	2	2
CO4	-	3	3	3	1	-	-	-	-	-	2	2

Paper Code(s): HS-204

Paper: Technical Writing

Course Objectives:

1:	To improve grammar and sentence structure and build vocabulary.
2:	To understand how to write different types of writings.
3:	To understand how to compose different types of business documents.
4:	To understand business ethics and develop soft skills.

Course Outcomes (CO):

CO1:	Ability to improve grammar and sentence structure and build vocabulary.
CO2:	Ability to write different types of writings with clarity.
CO3:	Ability to write different types of business documents.
CO4:	Ability to apply business ethics and enhance personality.

Course Outcomes (CO to Programme Outcomes (PO) Mapping (scale 1: low, 2: Medium, 3: High

CO/PO	*PO01*	*PO02*	*PO03*	*PO04*	*PO05*	*PO06*	*PO07*	*PO08*	*PO09*	*PO10*	*PO11*	*PO12*
CO1	-	-	-	-	-	1	-	-	-	3	-	-
CO2	-	-	-	-	-	1	-	-	-	3	-	-
CO3	-	-	-	-	-	1	-	-	-	3	-	-
CO4	-	-	-	-	-	1	-	3	-	3	-	-

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Department: Instrumentation and Control Engineering

Paper Code(s): ECC-206												
Paper: Communication Systems												
Course Outcomes (CO)												
CO 1	Ability to understand principal and working of electric and electronic measuring instruments											
CO 2	Ability to analyse various errors in measurement											
CO 3	Ability to evaluate the unknown quantities using measuring instruments											
CO 4	Ability to design bridge circuits for measurement of resistance, capacitance and inductance											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	2	2	2	2	1	2	1	-	2	2	-	3
CO 2	3	3	2	2	1	2	1	-	2	2	-	2
CO 3	2	2	1	2	1	2	1	-	2	2	-	2
CO 4	2	2	2	2	1	2	1	-	2	2	-	2

Paper Code(s): ECC-208												
Paper: Digital Electronics												
CO 1	Ability to understand conversion of codes and switching operations.											
CO 2	Ability to design combinational logic circuits using gates.											
CO 3	Ability to analyse sequential logic circuits.											
CO 4	Ability to understand applications of 555 timer and A to D and D to A converters.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	3	3	3	3	2	1	1	-	2	1	-	2
CO 2	3	3	3	3	2	1	1	-	2	1	-	2
CO 3	3	3	3	3	2	1	1	-	2	1	-	2
CO 4	3	3	3	3	2	1	1	-	2	1	-	2

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Department: Instrumentation and Control Engineering

Paper Code(s): ICC-210												
Paper: Sensors and Transducers												
Course Outcomes (CO)												
CO 1	Ability to define, understand various Sensors, their need and properties of sensors.											
CO 2	Ability to apply knowledge of various types of transducers in domestic and industrial applications											
CO 3	Ability to analyse various types of sensors for particular application.											
CO 4	Ability to design signal conditioning circuit for various sensors and transducers.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	3	3	2	1	1	1	1	-	1	3	-	3
CO 2	3	2	1	3	2	1	1	-	1	3	-	1
CO 3	3	2	1	2	3	1	1	-	1	3	-	3
CO 4	3	3	2	1	1	1	1	-	1	3	-	3

Paper Code(s): EEC-214												
Paper: Electrical and Electronics Measurements												
Course Outcomes (CO)												
CO 1	Ability to understand principal and working of electric and electronic measuring instruments											
CO 2	Ability to analyse various errors in measurement											
CO 3	Ability to evaluate the unknown quantities using measuring instruments											
CO 4	Ability to design bridge circuits for measurement of resistance, capacitance and inductance											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	3	2	-	-	-	-	-	-	-	-	-	3
CO 2	3	3	-	-	-	-	-	-	-	-	-	3
CO 3	3	3	2	3	-	-	-	-	-	2	-	3
CO 4	3	3	3	3	-	2	2	-	2	2	-	3

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Department: Instrumentation and Control Engineering

Semester: V

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Department: Instrumentation and Control Engineering

Paper Code(s): HS-301	
Paper: Economics for Engineers	
Course Outcomes (CO)	
CO 1	Analyze the theories of demand, supply, elasticity, and consumer choice in the market.
CO 2	Analyze the theories of production, cost, profit, and break-even analysis.
CO 3	Evaluate the different market structures and their implications for the behavior of the firm.
CO 4	Apply the basics of national income accounting and business cycles to Indian economy.

Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	1	2	1	2	1	-	1	-	1	1	3	1
CO 2	1	2	1	2	1	-	1	-	1	1	3	1
CO 3	1	2	1	2	1	-	1	-	1	1	3	1
CO 4	1	2	1	2	1	-	1	-	1	1	3	1

Paper Code(s): ECC-303	
Paper: Digital Signal Processing	
Course Outcomes (CO)	
CO 1	To understand the basic concept of DFT and FFT.
CO 2	To Acquire a clear idea of FIR filter designing techniques and realization methods.
CO 3	To understand the IIR filter designing techniques and realization methods and the stability.
CO 4	To understand the quantization errors in Digital Signal Processing and the concept of Multirate signal processing.

Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1	3	3	3	3	2	1	1	-	2	1	-	2
CO 2	3	3	3	3	2	1	1	-	2	1	-	2
CO 3	3	3	3	3	2	1	1	-	2	1	-	2
CO 4	3	3	3	3	2	1	1	-	2	1	-	2

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Department: Instrumentation and Control Engineering

Paper Code(s): EEC-307												
Paper: Introduction to Control Systems												
Course Outcomes (CO)												
CO 1	Ability to define, understand various terms related to control system and evaluation of transfer function											
CO 2	Ability to apply knowledge of various types of signals in time response of systems											
CO 3	Ability to analyse frequency response of systems											
CO 4	Ability to design compensators and controllers											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	3	3	2	1	1	1	1	-	1	3	-	3
CO 2	3	2	1	3	2	1	1	-	1	3	-	1
CO 3	3	2	1	2	3	1	1	-	1	3	-	3
CO 4	3	3	2	1	1	1	1	-	1	3	-	3

Paper Code(s): ICC-309												
Paper: Industrial and Optical Instrumentation												
Course Outcomes (CO)												
CO 1	Ability to understand various measurement techniques used for measuring industrial process variables											
CO 2	Ability to apply knowledge of various types of transducers, optical and analytical instruments for industrial applications											
CO 3	Ability to analyze the Optical sources and detectors and various types of measurement techniques for industrial applications											
CO 4	Ability to design signal conditioning circuit for various sensors and transducers used for measurement of industrial variables											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	3	3	-	-	-	2	-	-	-	2	-	3
CO 2	3	3	2	2	-	2	-	-	2	2	-	3
CO 3	3	3	3	3	-	2	-	-	2	3	2	3
CO 4	3	3	3	3	-	2	-	2	2	3	2	3

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Department: Instrumentation and Control Engineering

Paper Code(s): CIC-313												
Paper: Computer Networks												
Course Outcomes (CO)												
CO 1	Understand basic computer network technology.											
CO 2	Understand and explain Data Communications System and its components.											
CO 3	Implements various network topologies and IP addressing, subnetting.											
CO 4	Enumerate the layers of the OSI model and TCP/IP.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	3	2	1	1	3	1	-	-	-	-	-	3
CO 2	3	2	1	1	3	1	-	-	-	-	-	3
CO 3	3	2	1	1	3	1	-	-	-	-	-	3
CO 4	3	2	1	1	3	1	-	-	-	-	-	3

Paper Code(s): ECC-313												
Paper: Microprocessors and Microcontrollers												
Course Outcomes (CO)												
CO 1	Ability to understand and distinguish the use of different 8085 instructions, timing diagram, addressing modes, interrupts and apply those instructions for implementing assembly language programs.											
CO 2	Ability to analyse the timing diagrams, understand its instruction set, assess its memory organisation and will implement the assembly language programs , interfacing of memory with 8086 successfully											
CO 3	Understand and realize the interfacing of 8255 (PPI), 8254/8255 (PIT), 8251 (USART), 8259 (PIC), 8279 (Keyboard and display), Sample and hold circuit, DAC/ADC, LCD & Stepper motor with 8086 microprocessor.											
CO 4	Understand the architecture and operation of 8051 microcontroller and ability to use them for designing various applications based on 8051 by implementing the elaborate instruction set.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	3	3	3	2	-	1	1	-	-	-	-	1
CO 2	3	3	3	2	3	1	1	-		-		1
CO 3	3	3	3	2	3	1	1	-	1	-	-	1
CO 4	3	3	3	2	3	1	1	-	-	-	-	1

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Department: Instrumentation and Control Engineering

Semester: VI

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Department: Instrumentation and Control Engineering

Paper Code(s): MS-302												
Paper: Principles of Management for Engineers												
Course Outcomes (CO)												
CO 1	Examine the relevance of the political, legal, ethical, economic andcultural environments in global business											
CO 2	Evaluate approaches to goal setting, planning and organizing in a variety of circumstances.											
CO 3	Evaluate contemporary approaches for staffing and leading in an organization											
CO 4	Analyze contemporary issues in controlling for measuring organizational performance.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	2	2	1	2	-	2	-	-	1	2	3	2
CO 2	2	2	1	2	-	2	-	-	1	2	3	2
CO 3	2	2	1	2	-	2	-	-	1	2	3	2
CO 4	2	2	1	2	-	2	-	-	1	2	3	2

Paper Code(s): HS-304												
Paper: Universal Human Values												
Course Outcomes (CO)												
CO 1	Evaluate the significance of value inputs in formal education and start applying them in their life and profession											
CO 2	Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.											
CO 3	Examine the role of a human being in ensuring harmony in society and nature.											
CO 4	Apply the understanding of ethical conduct to formulate the strategy for ethical life and profession.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	-	-	-	-	-	3	-	3	1	1	-	1
CO 2	-	-	-	-	-	3	-	3	1	1	-	1
CO 3	-	-	-	-	-	3	-	3	1	1	-	1
CO 4	-	-	-	-	-	3	-	3	1	1	-	1

Paper Code(s): ICE-314T												
Paper: Advanced Control Systems for Instrumentation												
Course Outcomes (CO)												
CO 1	Understand and derive discrete-time mathematical model in both time domain and frequency domain											
CO 2	Apply and formulate mathematical model and state space model of physical systems.											
CO 3	Evaluate nonlinear system behaviour by phase plane and describing function methods and analyse its stability.											
CO 4	Design and assess different systems stability using Lyapunov stability analysis.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	3	3	3	2	3	-	-	-	-	-	-	3
CO 2	3	3	1	3	3	-	-	-	-	-	-	3
CO 3	3	3	3	3	3	-	2	-	1	-	-	3
CO 4	3	3	2	3	3	2	-	-	-	-	-	3

Paper Code(s): ICE-322T												
Paper: Neural Networks and Fuzzy Logic												
Course Outcomes (CO)												
CO 1	Apply artificial neural network concept for real-world problem with scientific tools.											
CO 2	Analyse the supervised and unsupervised learning algorithms and its applications.											
CO 3	Application of Fuzzy logic concepts to real world problem.											
CO 4	Develop fuzzy logic controller using fuzzy logic concepts.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	3	2	2	3	3	-	2	-	-	1	3	2
CO 2	3	3	1	1	1	-	1	1	-	2	2	1
CO 3	3	2	3	3	2	-	2	-	-	2	3	1
CO 4	1	2	3	2	2	-	1	-	-	1	2	2

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A-4, Paschim Vihar, Main Rohtak Road, New Delhi – 110 063

Department: Instrumentation and Control Engineering

Paper Code(s): ICE-328T												
Paper: Internet of Things												
Course Outcomes (CO)												
CO 1	Demonstrate basic concepts, principles and challenges in IoT.											
CO 2	Illustrate functioning of hardware devices and sensors used for IoT											
CO 3	Analyze network communication aspects and protocols used in IoT											
CO 4	Apply IoT for developing real life applications using Ardunio programming.											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	-	1	-	-	-	1	-	-	2	-	3	-
CO 2	1	-	2	-	3	-	-	-	-	1	-	2
CO 3	-	2	2	-	-	1	-	-	2	-	-	2
CO 4	2	1	-	-	2	-	-		-	1	1	-

Paper Code(s): OCSE-310T												
Paper: Data Structures and Algorithms												
Course Outcomes (CO)												
CO 1	Understand data structures like Arrays Stack,Queues,Linked lists and ability to choose the efficient data structures for given problem											
CO 2	Construct Binary Search trees ,Heap trees and AVL trees and learn about sparse matrix											
CO 3	Apply sorting and searching techniques efficiently and learn about Hashing and its types											
CO 4	Apply graph theory and its concepts in various applications and able to differentiate between trees and graphs											
Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)												
	PO01	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**
CO 1	3	2	2	3	2	3	2	1	2	3	2	1
CO 2	2	3	1	2	3	3	2	1	2	2	1	3
CO 3	1	2	3	3	2	1	1	2	3	3	2	1
CO 4	2	3	1	2	3	1	2	3	1	3	2	1

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Department: Instrumentation and Control Engineering

Paper Code(s): OCSE-306T	
Paper: C++ Programming	
Course Outcomes (CO)	
CO 1	Understand tokens, expressions, and control structures
CO 2	Explain arrays and strings and create programs using them
CO 3	Describe and use constructors and destructors
CO 4	Understand and employ file management

Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO 1		3	-	-	-	2	-	2	-	-	3	2
CO 2		-	2	-	-	-	2	-	-	3	-	-
CO 3	-	-	-	2	3	-	-	3	-	-	2	-
CO 4	3	-	3	-	-	3	3	-	3	-	-	3