THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II301T	Digital Circuits	3		---	3	30	70	100

Course Objectives	Course Outcomes
This course is intended ● To explain the importance of Electronics and number system ● To analyse and explain the importance of Boolean algebra and logic circuits ● To understand and explain the simplification of Boolean functions ● To describe, illustrate and analyse the use of combinational and sequential logic circuits	**Students will be able to** ● Convert a number from one number system to another and perform arithmetic operations in various types of number system such as binary, octal and hexadecimal etc ● Study different types of logic gates and properties of Boolean algebra ● Reduce Boolean expression to the minimum terms using logic design minimization techniques and formulate Sum of Product and Product of Sum. ● Design combinational circuits such as half adder, full adder, half subtractor, full subtractor, BCD adder, multiplexers and de-multiplexers etc. ● Explain the concept of synchronous and asynchronous sequential circuits like flip flops, latches and apply the concepts of flip flops to design registers and counters.

UNIT I

Number System: **[06 hours]**

Binary Numbers, Decimal numbers, hexadecimal numbers, octal numbers and number conversion, 1's complement and 2's complement representation. Arithmetic operations: binary addition, binary subtraction using 1's complement and 2's complement, binary multiplication and division, 2's complement arithmetic, octal addition, hexadecimal addition.

UNIT II

Boolean Algebra and logic circuits **[08 hours]**

Basic logic variables and logic functions-NOT, AND, NOR, XOR, OR, XNOR, NAND, idealized logic gates and symbols, truth tables, basic theorems and properties of Boolean algebra, DeMorgan's rules.

UNIT III

Simplification of Boolean Functions **[08 hours]**

Logic minimization, representation of truth table, SOP form, POS form, simplification of logical functions, minimization of SOP and POS form, don't care conditions, reduction techniques: k-maps up to 4 variables.

UNIT IV

Combinational Logic **[08 Hours]**

Different types of Codes: BCD, EXCESS-3, Gray code, binary code and their conversion. Circuits: half -adder, full adder, half subtractor, full subtractor, BCD adder using IC7483. Multiplexers (MUX): working of MUX, implementation of expression using MUX, Demultiplexers (DEMUX): implementation of expression using DEMUX, decoder, encoder.

UNIT V

Sequential Logic Circuit Design **[10 Hours]**

Sequential circuit introduction, difference between combinational circuits and sequential circuits, flip-flop: SR, JK, D, T; preset & clear, master and slave flip-flop, their truth tables and excitation tables conversion from one type to another type of flip-flop. Counters: asynchronous counter, synchronous counter, ring counter, BCD counter, Johnson counter.

Text Books

1. "Digital design", M.M. Mano, PHI, 4th edition
2. "Modern Digital Electronics", R. P. Jain, Tata McGraw-Hill, 3rd Edition
3. "Fundamentals of Digital Logic with VHDL Design", Stephen Brown, Zvonko Vranesic McGraw-Hill 2nd edition

Reference Books:

1. Electronic Devices and Circuit Theory: Robert L. Boylestad, Louis Nashelsky, Pearson Education, Ninth Edition
2. Electronic Devices and Circuits: S Salivahanan, N Suresh Kumar, Tata Mc Graw Hill Education Private Limited, Second Edition
3. Integrated Electronics, J. Millman and Halkias, TMH Publications

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II301P	Digital Circuits Lab	-	-	2	1	25	25	50

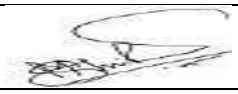
Course Objectives	Course Outcomes
1. To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. 2. To prepare students to perform the analysis and design of various digital electronic circuits.	After studying this course, the students would gain enough knowledge ● To explain the fundamental concepts and techniques used in digital electronics. ● To understand and examine the structure of various number systems and its application in digital design. ● The ability to understand, analyze and design various combinational and sequential circuits. ● To develop skill to build, and troubleshoot digital circuits.

- **All eight experiments to be performed from the list**

Expt. No.	Title of the experiment
1	**To study and verify truth table of basic logic gates**
2	**To study and demonstrate the working of combination logic circuit**
3	**To study and demonstrate the working of flip-flop circuits**
4	**To study and demonstrate the working of sequential logic circuits**
5	**To verify the operation of multiplexer and demultiplexer circuits**
6	**To study and demonstrate Half Adder**
7	**To study the memory unit and different types of memory**
8	**To study of basic properties of operation amplifier: Inverting & Non-inverting amplifier on virtual lab**

Text Books

S. N	Title	Authors	Edition	Publisher
1.	Analog and Digital Electronics	Charles H. Roth, Larry L. Kinney, Raghunandan G.H., Cengage Publication	1st Edition	Cengage Learning
2.	Principles of Electronics	V.K. Mehta	7th Edition	S.Chand Publications

		July 2024	1.1	Applicable for 2024-25
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III SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II302T	Analog and Digital Communication	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended ● Impart the basic concepts of analog modulation schemes. ● Describe different types of noise and predict its effect on various analog communication systems. ● Know the techniques of analog communication and digital communication.	Student will be able to ● Analyze basics of signals, its properties and application in communication system. ● Compare different modulation techniques. ● Evaluate the performance of pulse modulation and demodulation techniques in various transmission environments. ● Explain digital modulation techniques in communication systems ● Identify the basic elements of mobile communication system

Unit I INTRODUCTION TO ELECTRONIC COMMUNICATIONS AND SIGNALS **[6 Hrs]**

Introduction, Digital and Analog Sources and Systems, Deterministic and Random Waveforms Block Diagram of a Communication System, Power Measurements (dB, dBm, and Bel), Channel capacity and Ideal Communication Systems, Properties of Signals and Noise, classification of signals and systems, Power Spectral Density, Bandwidth of Signals

Unit II AMPLITUDE MODULATION AND ANGLE MODULATION **[9 Hrs]**

Introduction, Types of communication, Need of modulation, Modulation, Modulation Index, Importance of Modulation Index, Suppressed Carrier Systems, SSB and VSB, Generation of AM waves, Demodulation of AM waves, AM Transmitters and Receivers, Comparison of AM Techniques, Properties of Angle-Modulated Waves, Relationship between PM and FM Waves, Narrowband FM, Wideband FM, Transmission Bandwidth of FM Waves, FM Modulators and Transmitters, FM Demodulator and Receivers.

Unit III PULSE AND DATA COMMUNICATION **[8 Hrs]**

Introduction, Pulse Amplitude Modulation (PAM), Generation and Detection of PAM signals, Sampling Process, Pulse Width Modulation: Generation and Detection of PWM signals, Pusle Position Modulation (PPM): Generation and Detection of PPM Signals, Quantization Process, Pulse Code Modulation: Bandwidth of PCM system

Unit IV DIGITAL MODULATION **[9 Hrs]**

Introduction to Binary Modulation Schemes: ASK, PSK, FSK, QPSK: Mathematical Representation, Signal Space representation or Constellation Diagram, Waveforms, Generation and Reception, Comparison of binary modulation schemes.

Unit V INTRODUCTION TO WIRELESS COMMUNICATIONS **[8 Hrs]**

Introduction, GSM System, Architecture, Basic Terminology in Cellular Communications, Frequency reuse and hand-off, Multiple Access Schemes, FDMA, TDMA and CDMA, Comparison of all three multiple access scheme

Text Books

S.N	Title	Authors	Edition	Publisher
1	Analog and Digital Communication	Simon Haykin and Micheal Moher	2nd	Wiley
2	Digital and Analog Communications System	Leon W. Couch	8th	Pearson Education
3.	Introduction to Analog and Digital Communication	M.A. Bhagyaveni, R Kalidoss, K.S. Vishvaksenan	1st	River Publications

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Modern Digital and Analog Communications System	B. P. Lathi & Zhi Ding	Indian	Oxford Publication
2	Fundamentals of Digital Communication	Upmanyu Madhow	South Asian	Cambridge University Press
3	Introduction to Communication System	Upmanyu Madhow	1st	Cambridge University Press

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II302P	Analog and Digital Communication Lab	---	---	2	2	25	25	50

Course Objectives	Course Outcomes
This course is intended ● Impart the basic concepts of analog modulation schemes. ● Know the techniques of analog communication and digital communication.	**Students will be able to** ● Demonstrate generation and detection of analog and digital modulation techniques. ● Demonstrate generation and detection of keying techniques. ● Compare different modulation techniques. ● Identify the basic elements of mobile communication system

List of Experiments

- **Study the basic block diagram of Communication System.**
- **Calculation of Modulation Index by observing AM wave.**
- **To perform DSB-AM generation using AM transmitter.**
- **To perform DSB-AM reception using AM receiver.**
- **To perform FM modulator using varactor diode and reactance modulator.**
- **To perform PAM using sample and hold sampling.**
- **To perform PWM using different sampling frequency.**
- **To perform the FSK modulator and demodulator.**
- **To perform the ASK using MATLAB.**
- **To study and perform BPSK using MATLAB.**
- **To perform BPSK/DPSK/QPSK modulation/ demodulation & its spectral analysis**

Text Books

S.N	Title	Authors	Edition	Publisher
1	Analog and Digital Communication	Simon Haykin and Micheal Moher	2nd	Wiley
2	Digital and Analog Communications System	Leon W. Couch	8th	Pearson Education
3.	Introduction to Analog and Digital Communication	M.A. Bhagyaveni, R Kalidoss, K.S. Vishvaksenan	1st	River Publications

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S.N	Title	Authors	Edition	Publisher
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2	Fundamentals of Digital Communication	Upmanyu Madhow	South Asian	Cambridge University Press
3	Introduction to Communication System	Upmanyu Madhow	1st	Cambridge University Press

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II303T	Object Oriented Programming and Data Structures	4		-	4	30	70	100

Course Objectives	Course Outcomes
This course is intended ● Understand the principles of Object-Oriented Programming and develop skills in C++ to assess how the choice of data structures and algorithm design methods impacts program performance. ● Choose the appropriate data structure and algorithm design method for various applications, and write programs using C++. ● Design, implement, and analyze efficient solutions to problems using advanced C++ programming techniques, including inheritance, polymorphism, and dynamic data structures.	Student will be able to ● Develop and demonstrate basic programs using Object-Oriented Programming principles, focusing on function overloading and operator overloading. ● Implement various types of inheritance to create reusable and maintainable code, applying runtime polymorphism. ● Apply and analyze fundamental sorting and searching algorithms, and efficiently manage data using arrays. ● Design and implement stack and queue data structures using linked lists for dynamic data storage and processing. ● Implement and manipulate tree data structures, including binary search trees and threaded binary trees, for efficient data retrieval and storage.

Unit I **[10 Hrs]**

Introduction of Object-Oriented Programming and Overloading

Basic concepts of OOP: Encapsulation, Inheritance, Polymorphism, Abstraction Benefits and applications of OOP in IoT, Class members, access control, constructors, and destructors, Parameter passing methods, inline functions, static class members, friend functions Function overloading and generic programming, Function and class templates Operator overloading: Unary and binary operator overloading, rules for operator overloading

Unit II **[9 Hrs]**

Inheritance

Basics of inheritance: Base and derived classes, Types of inheritance: Single, multilevel, multiple, hierarchical, hybrid, virtual base class, Runtime polymorphism: Virtual functions, pure virtual functions, abstract classes

Unit III **[9 Hrs]**

Introduction to Data structure

Arrays: Introduction and linear arrays, representation in memory, Sorting algorithms: Selection sort, insertion sort, bubble sort, quick sort, merge sort, radix sort, searching algorithms: Linear search, binary search, Complexity analysis of sorting and searching algorithms, Multidimensional arrays and sparse matrices

Unit IV **[10 Hrs]**

Introduction of Stack and Queue

Introduction to stack and queue, Dynamic memory allocation, Linked lists: Introduction, representation of singly linked list in memory, Traversing, insertion, and deletion in linked lists, Implementation of stack using linked representation, Implementation of queue using linked representation

Unit V **[10 Hrs]**

Trees and Terminology

Basic terminology of trees, Binary trees: Representation and traversal (in-order, pre-order, post-order), Algebraic expressions and complete binary trees, Array and linked representation of binary trees, Binary search tree (BST) implementation, Operations on, BST: Searching, insertion, deletion, Threaded binary trees and traversal methods, Generalization of trees to graphs: Representation and traversal, Dijkstra's shortest path algorithm

Text Books

S.N	Title	Authors	Edition	Publisher
1	Object Oriented Programming with C++	E.Balagurusamy	-	Tata McGraw Hill Publications.
2	Data Strcture using C and C++	Y.Langsam	-	Pearson Education Publications
3	Fundamentals of Data Structures	Horowitz and Sahani	-	Galgotia Publications Pvt. Ltd
4	Data Structures using C & C++	A. M. Tanenbaum	-	PHI Publications.

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Mastering C++	K.R.Venugopal,B. RajKumar, T.RaviShankar	-	Tata McGraw Hill publication.
2	Problem solving with C++ The OOP	W. Savitch	-	Pearson education.
3	C++, the Complete Reference	Herbert Scheldt	-	Tata McGraw Hill Publications.
4	Data Structures and Program Design in C++	Robert L. Kruse, Alexander J. Ryba	-	PHI Publications
5	Object Oriented Programming in Microsoft C++	Robert Lafore	-	Galgotia Publications Pvt. Ltd

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II303P	Object Oriented Programming and Data Structures Lab	---	---	2	1	25	25	50

Course Objectives	Course Outcomes
1) Understand the concept of object-oriented programming and develop skills in C++ Language. 2) To choose the appropriate data structure and algorithm design method for a specified application. Write programs using C++ Language.	• Describe & Illustrate concept of object-Oriented Programming, function overloading, operator overloading • Classify Inheritance and develop program using c++. • Implement searching and sorting techniques using c++. • Implement operation like Searching, Insertion and Deletion, traversing mechanism on various data structure. • Design programs using data structures such as Binary tree and graph.

Expt. No.	Title of the experiment
1	Develop a program to calculate the area of a circle using Object-Oriented Programming principles.
2	Implement the concept of classes and objects to model a simple real-world entity.
3	Create a program to calculate the area of a circle and rectangle using default and parameterized constructors.
4	Demonstrate function overloading by creating multiple functions with the same name but different parameters.
5	Implement operator overloading for a custom class to perform arithmetic operations.
6	Overload unary operators for a custom class.
7	Overload binary operators for a custom class.
8	Demonstrate inheritance by creating a derived class from a base class and showing inheritance features.
9	Develop a program to implement the linear search technique on an array of integers.
10	Implement sorting algorithms, such as selection sort or bubble sort, to arrange elements in ascending order.
11	Design a program to perform stack operations, including push and pop, using an array or linked list.
12	Create a program to insert and delete nodes in a singly linked list.
13	Design, develop, and implement a menu-driven program for various operations on a Binary Search Tree (BST), including creation, insertion, deletion, and traversal (in-order, pre-order, and post-order).

Text Books

S.N	Title	Authors	Edition	Publisher
1	Object Oriented Programming with C++	E.Balagurusamy	--	Tata McGraw Hill Publications.
2	Data Strcture using C and C++	Y.Langsam	--	Pearson Education Publications
3	Fundamentals of data Structures	Horowitz and Sahani	--	Galgotia Publication Pvt. Ltd
4	Data Structures using C & C++	A. M. Tenenbaum	--	PHI Publications.

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Mastering C++	K.R.Venugopal,B.RajKumar,T. RaviShankar	--	Tata McGraw Hill publication.
2	Problem solving with C++ The OOP	W.Savitch	--	Pearson education.
3	C++, the Complete Reference	Herbert Scheldt	--	Tata McGraw Hill Publications.
4	Data Structures and Program Design in C++	Robert L. Kruse, Alexander J. Ryba	--	PHI Publications
5	Object Oriented Programming in Microsoft C++	Robert Lafore	--	Galgotia

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II304T	Mechatronics	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course aims to provide a foundational understanding of Mechatronics by integrating mechanical, electronic, and computer engineering principles. Students will learn about various sensors and advanced sensor technologies, including smart sensors and MEMS, and analyze different actuation systems to design and implement effective Mechatronics solutions.	Student will be able to • Describe the evolution and role of Mechatronics in automation. • Apply principles of various sensors in Mechatronics systems. • Evaluate smart sensor technologies and MEMS applications. • Design pneumatic, hydraulic, mechanical, and electrical actuation systems. • Utilize signal conditioning, microprocessors, microcontrollers, and PLCs.

Unit I	**[7Hrs]**
Introduction to Mechatronics: Evolution of Mechatronics, origins, Multidisciplinary scenario, importance of mechatronics in automation, Mechatronics system, products and systems in manufacturing, Advanced manufactruing system, CIM, Industrial robots and automatic quality control and inspection systems.	
Unit II	**[8 Hrs]**
Sensors: Sensors/Transducers, Principles, Classification, Parameters, Static characteristics, Dynamic characteristics, Displacement sensors, Positioning sensor, Proximity sensors, velocity sensors, motion sensors, Force sensors, Accelerometer sensors, temperature sensors, Selection of sensors	
Unit III	**7 Hrs]**
Smart Sensors, Sensor Technologies and Applications: Smart sensor basics: Introduction, mechanical-elecronics transition in sensing, nature of sensors, Micro-electromechanical system (MEMS) sensors, integration of micromachining and microelectronics. **Micromachining techniques:** Bulk micromachining, surface micromachining, LIGA process.	
Unit IV	**[9 Hrs]**
Actuators: Pneumatic & Hydraulic Actuation Systems: Actuation Systems, Pneumatic & Hydraulic Systems, Cylinders/Actuators, Directional Control Valves,Logic gate valves, direct & indirect control of single/double acting cylinder, development of pneumatic circuit for applications, cylinder sequencing. **Mechanical Actuation Systems:** Mechanical Systems, Types of motion, Kinematic chains, Cams, Gear Trains, Ratchet and Pawls, Belt and Chain Drives, Bearings, Mechanical Aspects of Motor Selection, **Electrical Actuation Systems:** Electrical Systems, Mechanical Switches, Solid-State Switches, Solenoid, DC Motors, AC Motors, Stepper Motors	
Unit V	**[9 Hrs]**
Signal Conditioning, Microprocessor, Microcontrollers, and Programmable Logic Controllers **Signal Conditioning:** Signal Conditioning, The Operational Amplifier, Protection, Filtering, Wheatstone Bridge, Digital Signals, Multiplexers, Data Acquisition, Digital Signal Processing, Pulse Modulation, **Microprocessors:** Control, Microprocessors Systems, Microcontrollers, Applications, **Programmable Logic Controllers:** Basic structure, I/O Processing, Data Handling, Analog Input/Output, Selection of PLC	

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Mechatronics	W. Bolton		Pearson Education Ltd
2.	Sensors and Transducers	D. Patranabis		PHI Publication
3.	Mechatronics Integrated Mechanical Electronics Systems	K P Ramchandran, G k Vijayaraghavan, m S Balasundaram		Wiley

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Mechatronics	HMT Ltd	Third Edition (Kindle Edition)	Tata McGraw-Hill
2	Introduction to Mechatronics	Appu kuttan K.K		**Oxford University Press**

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II304P	Mechatronics Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To provide students with practical knowledge of selection of sensors, actuators, signal conditioning, signal processing in design and analysis of Systems for various applications.	● To develop a measurements system by selecting appropriate sensors to measure a physical quantity ● To develop pneumatic / hydraulic circuit for given application using actuators and control valves. ● Implementation of ladder diagram, programming using PLC to develop a new mechatronics application. ● design & develop a measurement system using Data Acquisition System.

- **Minimum eight experiments to be performed from the list**

Expt. No.	Title of the experiment
1	Performance based on the working of Digital-to-analog conversion.
2	Performance based on the working of Analog-to-digital conversion.
3	To design & develop a measurement system using Data Acquisition System & LabVIEW software.
4	Performance based on pneumatic/hydraulic cylinder using single acting & double acting cylinder.
5	Performance based on Temperature measurement sensor
6	Performance based on distance measurement sensor.
7	Performance based on weight measurement sensor
8	Performance based on displacement measurement sensor
9	Performance based on proximity sensor (Inductive & Capacitive)
10	Performance based on water level indication sensor
11	Development of ladder diagram, programming using PLC for Lift / elevator control.
12	Development of ladder diagram, programming using PLC for electro-hydraulic system.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Mechatronics	W. Bolton		Pearson Education Ltd
2.	Sensors and Transducers	D. Patranabis		PHI Publication
3.	Mechatronics Integrated Mechanical Electronics Systems	K P Ramchandran, G K Vijayaraghavan, m S Balasundaram		Wiley

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Mechatronics	HMT Ltd	Third Edition (Kindle Edition)	Tata McGraw-Hill
2	Introduction to Mechatronics	Appu kuttan K.K		**Oxford University Press**

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ES301T	Value Education Course - I	2	-	-	2	20	30	50

Course Objectives	Course Outcomes
This course is intended • To develop a holistic perspective through self-exploration and development of clarity about harmony between self, family, society and nature.	**Students will be able to** • demonstrate awareness about concepts like self exploration & natural acceptance. • understand concepts of aspirations and happiness. • develop clarity of harmony and health in human being. • discuss concepts of conservation of nature and harmony in nature/existence and re-usability.

Unit I : Introduction to Self-Exploration **[6Hrs]**

- Purpose & motivation for studying universal human values.
- Self-Exploration–what is it? - Its content and process.
- 'Natural Acceptance' and Experiential Validation- as the process for self-exploration.

Unit II: Understanding Happiness and Prosperity **[6Hrs]**

- Understanding Happiness and Prosperity correctly.
- Continuous Happiness and Prosperity- A look at basic Human Aspirations.
- Right understanding, Relationship and Physical Facility.
- Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Unit III: Understanding Harmony in human being **[6Hrs]**

- Understanding human being as a co-existence of the sentient 'I' and the material 'Body'.
- Understanding the needs of Self ('I') and 'Body' - happiness and physical facility.
- Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).
- Understanding the characteristics and activities of 'I' and harmony in 'I'.
- Understanding the harmony of I with the Body: Sanyam and Health.

Unit IV: Co-existing with nature **[6Hrs]**

- Understanding the harmony in Nature.
- Interconnection and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature.
- Understanding Existence as Coexistence of mutually interacting units in all-pervasive space.
- Holistic perception of harmony at all levels of existence.
- Pollution, depletion of resources and role of technology.

Text Books

Sr.No.	Title	Authors	Edition	Publisher
1	Human Values and Professional Ethics	Gaur, Sangal, Bagaria	2010	Excel Books, New Delhi

Reference Books

Sr.No.	Title	Authors	Edition	Publisher
1	Jeevan Vidya: Ek Parichaya	A. Nagaraj	1999	Jeevan Vidya Prakashan, Amarkantak
2	Human Values	A.N. Tripathi	2004	New Age Intl. Publishers, New Delhi
3	The Story of My Experiments with Truth	M.K.Gandhi	2009	Fingerprint! Publishers

Online Resources

1	https://fdp-si.aicte-india.org/UHV-II%20Class%20Note.php
2	https://fdp-si.aicte-india.org/UHV-II_Lectures_PPTs.php

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23II331M	MDM – I Design, Technology and Innovation	2	-	-	2	15	35	50

Course Objectives	Course Outcomes
This course is intended	Students will be able to
To define the foundational concepts of design, technology, and innovation by analyzing real-world case studies.	Identify key elements of successful innovations through case studies and real-life examples.
To apply collaborative innovation methods to propose solutions for complex challenges in various domains.	Design and present a collaborative innovation model for addressing a specific problem statement.
To evaluate the importance of user-centered design principles in creating impactful innovations.	Implement user-centered design principles in the development of a prototype solution.
To demonstrate the ability to research, ideate, and develop innovative solutions in a systematic manner.	Produce a comprehensive research report outlining the process from ideation to prototyping in an innovative project.

Unit I **[6 Hrs]**

Jaipur Foot - A classic innovation by Prof. B. K. Chakravarthy

User Centred Helmet Design by Prof. B. K. Chakravarthy

Challenges of Reaching a Million Users by Prof. Chetan Solanki and Prof Jayendran V

Unit II **[6 Hrs]**

Technology to Solution by Prof. Ramesh Singh

A Collaborative Excellence by Prof. B. Ravi & Prof. B. K. Chakravarthy

Collaborative Innovation Methods by Prof B. K. Chakravarthy

Unit III **[6 Hrs]**

Learnings from Grassroot Innovation by Prof. Anil Gupta

Systemic Approach to Biomed Innovations by Prof. B. Ravi

Unit IV **[6 Hrs]**

Research to Innovation by Prof. Amaresh Chakrabarti

Smartcane for the Blind- A Success Story by Prof. P. V. Madhusudhan

References

https://onlinecourses.nptel.ac.in/noc24_de14/preview
(NPTEL course on Design, Technology and Innovation)