

K. D. K. College of Engineering, Nagpur

Syllabus – Third Semester

Bachelor of Technology (Electronics and Telecommunication Engineering)

KDK COLLEGE OF ENGINEERING, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH. (Electronics and Telecommunication Engineering)

Semester III	Subject Code: 3BET01T	Name of Subject: Electronics Devices and Circuits		
Total Hours Distribution per week				
Total Credit: 3	Lecture (L): 3 Hrs		Tutorial (T) : -	Practical (P): -
Examination Scheme				
Mid Sem Examination	Continuous Assessment	End Sem Examination	Total Marks	Examination Duration:
30 Marks	20 Marks	50 Marks	100 Marks	3 Hours

Course Objectives	
1	Understand the operation and characteristics of Bipolar Junction Transistors (BJTs) in various configurations.
2	Analyze transistor biasing techniques and their influence on circuit stability.
3	Comprehend the working principles of Field Effect Transistors (FETs) and their small signal modeling.
4	Study the operation of feedback amplifiers and different types of oscillators.
5	Explore the working and performance of various power amplifier classes.

Course Outcomes	
After completion of syllabus , students would be able to	
1	Explain the operation, characteristics, and applications of BJT in different configurations.
2	Analyze different transistor biasing techniques and evaluate circuit stability under varying conditions.
3	Apply and analyze the characteristics and amplifier configurations of FET and MOSFET.
4	Explain and analyze the concepts of feedback in amplifiers and oscillator circuits.
5	Evaluate the operation and efficiency of power amplifiers and identify sources of distortion.

Course Competencies:

- Understand the physical operation and characteristics of BJT and MOSFET devices.
- Analyze biasing circuits for stability and design considerations.
- Apply knowledge of FETs to design basic amplifier circuits.
- Study and simulate feedback mechanisms and their impact on gain and stability.
- Evaluate performance parameters in power amplifiers and optimize efficiency.

CO-PO Articulating Matrix:

CO	Program Outcomes & Program Specific Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	2	2	2	-	-	1	1	-	2	3	2	2
CO2	3	3	3	2	-	-	1	1	1	2	3	3	3
CO3	3	3	3	3	-	-	1	1	-	3	3	3	3
CO4	2	3	3	3	-	-	1	1	1	3	3	3	2
CO5	3	3	3	3	1	1	2	2	2	3	3	3	3

Syllabus

Unit	Details of Topic	Hours	CO Mapping
I	Bipolar Junction Transistors: Bipolar Junction Transistors: Physical structure and operation modes, Active region operation of transistor, DC analysis of transistor circuits, Ebor-Moll model, Current voltage characteristics of CE, CB, CC configuration Transistor as an amplifier, Transistor as a switch.	8	CO1
II	Transistor Biasing Techniques: Transistor Biasing, The Operating Point, Bias Stability, Self-Bias, Fixed bias, collector to base bias, Emitter feedback bias, Stabilization against Variations in I_{co} , V_{BE} , and β , Collector-Current Stability, Thermal Runaway	8	CO2
III	MOSFET and Biasing Techniques: Field-effect Transistors -The Junction Field-effect Transistor, The Pinch-off Voltage, The JFET Volt- Ampere Characteristics of the MOSFET, Small Signal Equivalent Model, MOSFET Amplifiers: Common Source, Common Drain and Common Gate Amplifiers.	8	CO3
IV	Feedback Amplifiers and Oscillators: Feedback Amplifier: The General Feedback Structure, Various properties of Negative and positive Feedback, The Four Basic Feedback Topologies. Oscillator: R-C Oscillator, L-C Oscillator, Crystal oscillator	8	CO4
V	Power Amplifier: Power Amplifier: Class A, Class B, Class AB and Class C, Class D. Power Efficiency, Power Dissipation, Cross- Over Distortion in Class AB Circuits, Class A Transformer Coupled Power Amplifier, and Harmonic Distortion due to Large Signal operation.	8	CO5

Suggested Activities / Micro Projects:

Unit	Suggested Activity / Micro Project
I	Simulation of CE, CB, CC amplifier circuits using Multisim or LTSpice
II	Design and analysis of different transistor biasing circuits and determination of Q-point
III	Mini project: Design of an amplifier using MOSFET and simulation using software tools
IV	Demonstration of RC phase shift or Colpitts oscillator circuits using breadboard/simulation
V	Construct a Class-B power amplifier and measure efficiency and harmonic distortion

Online Resources:

1. NPTEL Course: Electronic Devices and Circuits by IIT Kharagpur
2. All About Circuits: <https://www.allaboutcircuits.com>
3. Electronics Tutorials: <https://www.electronics-tutorials.ws>
4. LTSpice Simulation Resources: <https://www.analog.com/en/design-center/design-tools-and-calculators/ltspice-simulator.html>

Teacher's Resources:

- Use of digital tools like **Multisim, LTSpice, Proteus** for demonstrations and assignments.
- Assignments on **transistor modeling, biasing, and MOSFET amplifier designs**.
- Use NPTEL lecture videos for **flipped classroom** or blended learning sessions.
- Conduct **hands-on labs** for amplifier circuits, oscillators, and power amplifier stages.
- Include **mini projects** for practical exposure like audio amplifier or signal generator.

Text/Reference Books:

1. Sedra Smith, Microelectronics Circuits, 5th Edition 2010-01-07, Oxford Uni. Press.
2. Millman Halkias, Integrated Electronics, 7th edition 2009, Tata McGraw Hills.
3. Electronic Devices and Theory, Boylestad, Nashelsky, 9th. Edition May 2010, PHI.
4. Electronic Devices and Circuits, S Salivahanan, N Suresh Kumar, 3rd Edition, Tata McGraw Hills.

			June 2025	1.00	Applicable for AY 2025-26 Onwards
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KDK COLLEGE OF ENGINEERING, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH. (Electronics and Telecommunication Engineering)

Semester III	Subject Code: 3BET01P	Name of Subject:	
		Electronics Devices and Circuits Lab	
Total Hours Distribution per week			
Total Credit: 1	Lecture (L): -	Tutorial (T) : -	Practical (P): 2 Hrs
Examination Scheme			
Continuous Assessment		End Sem Examination	Total Marks
25 Marks		25 Marks	50 Marks

Course Objectives	
1	To enable students to understand the characteristics of BJT, FET, and MOSFET through practical experiments.
2	To develop the ability to design and analyze amplifier and oscillator circuits using discrete components.
3	To enhance skills in observing, recording, and interpreting electronic circuit behavior.
4	To cultivate problem-solving abilities through real-time electronic circuit implementation.
5	To prepare students for industrial applications and higher electronics-based studies

Course Outcomes	
After completion of syllabus , students would be able to	
1	Analyze input and output characteristics of BJT in CB and CE configurations.
2	Examine biasing and frequency response of transistor amplifiers.
3	Evaluate FET and MOSFET characteristics for amplification applications.
4	Design and simulate different oscillator circuits.
5	Investigate performance of power amplifiers for audio frequency applications.

CO-PO Articulating Matrix:

CO-PO Articulating Matrix													
CO	Program Outcomes & Program Specific Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	3	2	-	-	-	-	-	2	3	2
CO2	3	3	3	3	3	-	-	1	1	1	2	3	3
CO3	3	3	2	3	3	-	-	-	-	-	2	3	3
CO4	3	2	3	3	3	-	-	-	1	1	3	3	3
CO5	3	2	3	3	3	1	1	2	2	2	3	3	3

Contents/List of Experiments

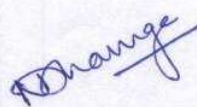
Exp. No.	Topics / Experiment Description	Mapped CO
1	I/P & O/P Characteristics of Common Base Transistor	CO1
2	I/P & O/P Characteristics of Common Emitter Transistor Configuration	CO1
3	Study & Analysis of Self Bias Circuit using BJT	CO2
4	Frequency Response of Single Stage CE Amplifier	CO2
5	Drain and Transfer Characteristics of FET	CO3
6	Drain and Transfer Characteristics of MOSFET	CO3
7	Frequency Response of Common Source MOSFET Amplifier	CO3
8	Study & Analysis of RC Phase Shift Oscillator	CO4
9	Study & Analysis of Wein Bridge Oscillator	CO4
10	Study & Analysis of Hartley LC Oscillator	CO4
11	Study & Analysis of Colpitt's LC Oscillator	CO4
12	Study & Analysis of Power Amplifier	CO5

Suggested Activities / Micro Projects/Contents beyond Syllabus:

Activity	Suggested Activity / Micro Project
1	Design a Single-stage CE amplifier for a given gain using simulation software.
2	Compare performance of BJT and MOSFET in amplifier configuration using Proteus or LTSpice.
3	Design an audio oscillator for a specified frequency using breadboard.
4	Build and test a simple audio power amplifier circuit.
5	Develop a poster/chart explaining differences in oscillator types with waveform snapshots.
6	Simulate and plot frequency response of amplifiers and oscillators.

Online Resources:

- **NPTEL Video Lectures:**
 1. Analog Electronic Circuits by Prof. D.Roy Choudhury – IIT Kharagpur
 2. <https://nptel.ac.in/courses/117105077>
- **YouTube Channels:**
 1. All About Electronics
 2. Electronics Hub
 3. Elprocus Tutorials
- **Simulation Tools:**
 1. LTSpice
 2. Tinkercad Circuits
 3. Falstad Circuit Simulator

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B.TECH. (Electronics and Telecommunication Engineering)

B.TECH. (Electronics and ...)				
Semester III	Subject Code: 3BET02T	Name of Subject: Digital System Design with HDL		
Total Hours Distribution per week				
Total Credit: 3	Lecture (L): 3 Hrs		Tutorial (T) : -	Practical (P): -
Examination Scheme				
Mid Sem Examination	Continuous Assessment	End Sem Examination	Total Marks	Examination Duration:
30 Marks	20 Marks	50 Marks	100 Marks	3 Hours

Course Objectives	
1	Introduce the concepts of hardware description languages (HDL) and the principles of digital system modeling using VHDL at various levels of abstraction.
2	To address the challenges in hardware design by discussing the role of digital components in system design
3	To concentrate on HDL based digital design, HDL terminology, architecture and design of combinational and sequential circuit.
4	To learn about modeling of system tested with test bench
5	Expose students to the internal architectures of Programmable Logic Devices (PLDs), including CPLDs and FPGAs, and demonstrate how to implement digital systems using place-and-route tools.

Course Outcomes	
After completion of syllabus, the student shall be able to	
1	Describe the evolution, abstraction levels, and design methodologies in digital system design using HDL.
2	Use basic VHDL constructs to model combinational and sequential digital logic circuits.
3	Develop modular designs using subprograms, packages, generics, and create test benches for verification.
4	Analyze and design synchronous/asynchronous finite state machines using HDL.
5	Implement digital designs on CPLDs and FPGAs using place-and-route processes and apply VHDL for real-world applications.

Course Competencies:

1. **Understand** the basic structure of digital system design and levels of abstraction using HDL.
2. **Apply** VHDL constructs to model and simulate digital logic circuits.
3. **Design** combinational and sequential circuits using VHDL, including FSMs.
4. **Develop** test benches and configuration blocks for simulation and verification.
5. **Implement** hardware systems using programmable logic devices like CPLD/FPGA.
6. **Utilize** modern engineering tools and HDL environments for digital circuit design.

CO-PO Articulating Matrix:

CO	Program Outcomes & Program Specific Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	1	1	1	-	-	-	-	2	2	1
CO2	3	3	2	2	3	-	-	-	1	-	1	3	2
CO3	3	2	3	2	3	-	-	1	2	1	2	3	2
CO4	3	3	3	3	3	1	-	1	1	1	2	3	3
CO5	3	2	3	2	3	1	-	1	1	1	3	3	3

Syllabus

Unit	Details of Topic	Hours	CO Mapping
I	INTRODUCTION TO DIGITAL SYSTEM DESIGN: A Brief History of HDL, System representation, Levels of abstraction, Top down design, design units, data objects, VHDL operators, concurrent and sequential system.	08	CO1
II	BASIC LANGUAGE CONSTRUCTS OF VHDL: Skeleton / syntax of VHDL program, Data types, concurrent Signal assignments, combinational versus sequential circuits, signal assignment statements, conditional signal assignment, selected signal assignment, conditional versus selected signal assignment statements, combinational logic circuit design and VHDL implementation.	08	CO2
III	SUBPROGRAM: Function, program, attributes, generic, generate, package, IEEE standard logic library, file I/O, test bench, component declaration and component instantiation, configuration.	08	CO3
IV	FINITE STATE MACHINE: Overview of FSM, FSM representation, Moore Machine versus Mealy machine, VHDL representation of an FSM, State assignment, some FSM design examples – sequence detector, FSM based binary counter. Analysis of Asynchronous sequential circuit – flow table reduction-races-state assignment-transition table and problems in transition table.	08	CO4
V	PROGRAMMABLE LOGIC DEVICES: Introduction to place & route process, Architecture of CPLD (XILING / Altera), FPGA XILING 4000 series. Overview of PLDs, CPLD, FPGA. Design Examples: ALU, barrel shifter, 4*4 keyboard scanner, up to 3 bit multiplier.	08	CO5

Suggested Activities / Micro Projects

Unit	Topic	Suggested Activity / Micro Project
I	Introduction to Digital System Design	Create a concept map or presentation explaining levels of abstraction and top-down design in HDL.
II	VHDL Constructs and Combinational Circuits	Design and simulate a 4-bit comparator or multiplexer using VHDL.
III	Subprograms and Packages	Write VHDL code for a configurable 4-bit adder using generics and create a test bench.
IV	Finite State Machines	Design a sequence detector FSM (e.g., detecting "1011")

	(FSMs)	and simulate using ModelSim or Vivado.
V	Programmable Logic Devices	Implement a 3-bit binary multiplier or ALU on an FPGA development board (e.g., using Xilinx ISE or Vivado).

Online Resources:

Category	Resource
Video Lectures	NPTEL Digital System Design with VHDL – IIT Roorkee
VHDL Reference	Nandland VHDL Guide
Online Simulator	EDA Playground – Run VHDL/Verilog code online
FPGA Vendor Resources	Xilinx Developer Hub
Tutorials & Forums	All About Circuits

Teacher's Resources

- Use **ModelSim**, **Vivado**, or **Xilinx ISE** for lab demonstrations and simulations.
- Employ **EDA Playground** for in-class activities when hardware isn't available.
- Include **mini design projects** in the form of FSMs, ALUs, or code converters for internal assessments.
- Encourage students to submit **code and waveform snapshots** as part of weekly assignments.
- Organize **seminars or workshops** on FPGA programming and hardware deployment.
- Use **NPTEL lectures** for blended or flipped learning models.
- Evaluate students using **rubrics based on simulation accuracy, coding standards, and documentation**.

TEXT BOOKS:

1. VHDL 4th Edition Douglas Perry-TMH
2. Fundamentals of Digital Logic with VHDL design – Stephen Brown, Zvonko Vranesic – TMH
3. Digital Design Principles – Fletcher
4. VHDL Synthesis – J. Bhaskar
5. VHDL Primer - J. Bhaskar – Pearson Education

REFERENCE BOOKS:

1. Digital System Design using VHDL – Charles H. Roth, McGraw Hill Publication
2. Digital System Design- John Wakerley, McGraw Hill Publication
3. VHDL- Zainalabedin Navabbi, McGraw Hill Publication
4. VHDL – D. Smith
5. Digital Design with VHDL – Dr. S. S. Limaye, McGraw Hill Publication

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B.TECH. (Electronics and Telecommunication Engineering)

Semester III	Subject Code: 3BET02P	Name of Subject: Digital System Design with HDL Lab	
Total Hours Distribution per week			
Total Credit: 1	Lecture (L): -	Tutorial (T) : -	Practical (P): 2 Hrs
Examination Scheme			
Continuous Assessment		End Sem Examination	Total Marks
25 Marks		25 Marks	50 Marks

Course Objectives	
1	To familiarize students with modeling digital circuits using Verilog HDL.
2	To impart hands-on experience in designing combinational and sequential logic circuits.
3	To develop understanding of different modeling styles: Gate-level, Dataflow, Behavioral, and UDP.
4	To simulate, verify, and synthesize logic designs using standard EDA tools.
5	To prepare students to implement finite state machines and digital modules for real-time systems.

Course Outcomes	
After completion of syllabus , students would be able to	
1	Model combinational circuits using gate-level, operator-based, and user-defined primitives.
2	Design and simulate sequential logic circuits using flip-flops, shift registers, and counters.
3	Implement and analyze FSMs for pattern detection using Moore and Mealy models.
4	Construct arithmetic modules like adder and adder-subtractor using HDL.

CO-PO Articulating Matrix:

CO	Program Outcomes & Program Specific Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	3	2	3	-	-	1	1	1	2	3	2
CO2	3	3	3	2	3	-	-	1	1	1	2	3	3
CO3	3	3	3	3	3	1	1	2	1	1	3	3	3
CO4	3	2	3	2	3	-	-	1	1	1	2	3	2

Contents/List of Experiments:

Exp.No.	Experiment Title	Mapped CO
1	Design equation $z = ax + by + cxy$ using Gate Level Modeling	CO1
2	Design equation $z = ax + by + cxy$ using Operators of Verilog	CO1
3	Design equation $z = ax + by + cxy$ using User-Defined Primitives (UDP)	CO1
4	Verilog Modules for D, T, SR, and JK Flip-Flops	CO2
5	Verilog Modules for PIPO, PISO, SISO, and SIPO Shift Registers	CO2
6	Verilog Modules for Binary and BCD Counters	CO2
7	Verilog Module for Sequence Detection (1101) using Moore FSM	CO3
8	Verilog Module for Sequence Detection (1011) using Mealy FSM	CO3
9	Verilog Module for 4-bit Adder	CO4
10	Verilog Module for 4-bit Adder-Subtractor	CO4

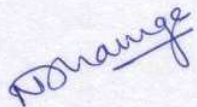
Suggested Activities / Micro Projects:

Activity	Suggested Activity / Micro Project
1	Design a traffic light controller using FSM in Verilog.
2	Develop a 3-bit up-down counter with control input.
3	Compare Moore vs Mealy FSM designs for different sequences.
4	Simulate a 4-bit Arithmetic Logic Unit (ALU) using behavioral modeling.
5	Create a testbench for verifying Shift Register operation.
6	Design a mini calculator using HDL for addition/subtraction of 4-bit numbers.

Online Resources:

- **NPTEL Courses:**
 1. [Digital System Design Using Verilog - IIT Hyderabad](#)
 2. [Introduction to Verilog - IIT Kharagpur](#)
- **YouTube Channels:**
 1. HDLBits Tutorials
 2. VLSI Academy
 3. Digilent Learning Series
- **Simulators & IDEs:**
 1. Xilinx Vivado
 2. ModelSim (Mentor Graphics)
 3. EDAPlayground – <https://www.edaplayground.com/>
 4. Icarus Verilog with GTKWave Viewer
- **Practice Platforms:**

<https://hdlbits.01xz.net> – Practice problems for Verilog

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Semester : III Sem	Subject Code: 3BETMD01T	Name of Subject: Introduction to Artificial Intelligence		
Total Hours Distribution per week				
Total Credit: 3	Lecture (L): 3 Hrs		Tutorial (T) : -	Practical (P): -
Examination Scheme				
Mid Sem Examination	Continuous Assessment	End Sem Examination	Total Marks	Examination Duration:
30 Marks	20 Marks	50 Marks	100 Marks	3 Hours

Course Objectives	
1	To introduce fundamental concepts of Artificial Intelligence and intelligent agents
2	To understand various searching techniques and knowledge representation methods.
3	To explore uncertainty handling, probabilistic reasoning, and learning methodologies.
4.	To familiarize with expert systems and their building blocks
Course Outcomes	
After completion of syllabus, the student is able to	
CO1	Explain AI fundamentals, its history, applications, and challenges.
CO2	Apply informed and uninformed search strategies to solve AI problems
CO3	Demonstrate knowledge representation techniques and inference mechanisms.
CO4	Handle uncertainty using Bayesian methods and fuzzy logic
CO5	Describe learning approaches and the components of expert systems.

Course Competencies:

1. Students will be able to understand the definition and history of AI.
2. Students will be able to identify real-world applications and domains of AI.
3. Students will be able to recognize AI's interdisciplinary nature
4. Describe the structure of intelligent agents and implement uninformed and informed search algorithms.
5. Students will be able to analyze agent environments and decision-making processes also Analyze algorithm complexity and suitability.

CO-PO Articulating Matrix:

CO	Program Outcomes & Program Specific Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	3	-	-	-	-	-	-	-	2	3	2
CO2	3	3	3	2	2	-	-	1	-	-	2	3	2
CO3	3	3	3	2	2	-	-	1	2	2	2	3	2
CO4	3	3	3	2	2	-	-	1	2	2	2	3	2
CO5	3	3	3	2	2	-	-	1	2	2	2	3	2

SYLLABUS:

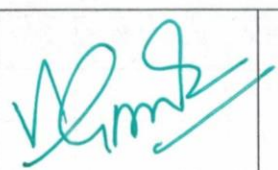
Unit	Details of Topic	Hours	COs
I	Introduction to Artificial Intelligence and Intelligent Agents: What is AI? The Turing Test, Branches of AI, Brief History of AI, Applications of AI, Challenges for the Future, Production System and State Space Representation, Introduction to Intelligent Agents and Types, Characteristics and Ethics of AI.	8	CO1
II	Searching Techniques: Basic Idea Behind Search Algorithms , Uninformed Search: Depth First Search (DFS), Breadth First Search (BFS) , Heuristic-Based Search: Greedy Best First Search, A* Search, AO* Algorithm , Local Search Algorithms: Hill-Climbing, Simulated Annealing	7	CO2
III	Knowledge Representation and Reasoning: Knowledge Representation Issues, First Order Logic and Predicate Logic, Backward Chaining and Resolution, Semantic Nets, Frames, and Scripts Ontology.	7	CO3
IV	Fuzzy Logic: Handling Uncertain Knowledge , Rational Decisions , Introduction to Bayes' Rule and Bayesian Networks, Introduction to Fuzzy Logic	7	CO4
V	Learning - Learning: Concepts, Knowledge and Learning , Learning in Problem Solving , Learning from Example Learning Probabilistic Models , Expert Systems: Fundamental Blocks and Knowledge Engineering.	7	CO5

Text Books

1. Artificial Intelligence: A Modern Approach, Stuart Russell and Peter Norvig, Pearson Education.
2. Artificial Intelligence, Elaine Rich, Kevin Knight, McGraw Hill.
3. Artificial Intelligence and Expert Systems, Dan W. Patterson, Pearson Education.
4. Introduction to Artificial Intelligence, Wolfgang Ertel, Springer

References Books:

1. Stuart Russell & Peter Norvig, Artificial Intelligence: A Modern Approach, 4th Edition, Pearson Education.
2. Elaine Rich, Kevin Knight, and Shivashankar B. Nair, Artificial Intelligence, 3rd Edition, McGraw Hill Education.
3. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems, Pearson Education.

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KDK College of Engineering, Nagpur

B. Tech.

CE/ ME/ EE/ CSE/ IT/ AI&DS/ ETC Engineering

Semester III	Subject Code: 3BOE01T - A	Name of Subject: Principles of Management		
Total Distribution per week				
Total Credit: 3	Lecture (L): 3	Tutorial (T): 0		Practical (P): 0
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
20 Marks	30 Marks	50 Marks	100 Marks	3 Hrs

Course Objectives	
1	To enable students, understand the fundamental concepts of management, including the evolution and managerial roles and functions.
2	To enable students to learn the principles, processes, and types of planning and decision-making in managerial contexts.
3	To analyze different organizational structures and processes including staffing, delegation, and departmentalization.
4	To understand behavioral aspects of directing, including motivation, leadership, and communication.
5	To make them learn various control mechanisms, including budgeting and performance monitoring, to improve organizational productivity and effectiveness.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Define and explain the core concepts of management and distinguish between managers and administrators.
2	Demonstrate knowledge of planning, including setting objectives, formulating policies, and applying planning tools and techniques.
3	Analyse different organizational structures and processes including staffing, delegation, and departmentalization.
4	Understand behavioural aspects of directing, including motivation, leadership, and communication.
5	Utilize various control mechanisms, including budgeting and performance monitoring, to improve organizational productivity and effectiveness.

Course Competencies	
1	Apply foundational knowledge of management principles and develop the ability to plan, organize, lead, and control organizational activities effectively.
2	Implement communication skills, leadership skills, decision-making skills and performance monitoring skills to improve productivity and efficiency

CO_PO Mapping											
	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	-	-	-	-	2	2	-	-	3	3
CO2	2	2	-	-	3	-	-	-	--	3	3
CO3	-	3	-	-	-	-	-	3	-	3	3
CO4	-	-	-	-	-	-	3	3	3	-	3
CO5	-	2	-	-	-	-	-	-	-	3	3

Course Contents		Mapped with CO
Unit I : Introduction to Management:	8	CO1
Definition, Nature, Importance, Scope of Management – managerial roles and skills- Science or Art – Manager Vs Administrator – Evolution of Management – Scientific, human relations, system and contingency approaches (contributions of F.W Taylor, Henry Fayol, Elton Mayo, Glberth and McGregor) - Levels and Functions of Management.		
Unit II : Planning:	8	CO2
Nature and purpose of planning – planning process – types of planning – objectives – setting objectives – policies – Planning premises – Planning Tools and Techniques – Decision making steps and process.		
Unit III : Organizing:	8	CO3
Nature and purpose – Formal and informal organization – organization chart – organization structure – types – Line and staff authority – departmentalization – delegation of authority – centralization and decentralization –Span of Management - Job design- Recruitment, selection, Training and Compensation.		
Unit IV : Directing:	8	CO4
Foundations of individual and group behavior – motivation – motivational techniques – job enlargement – job enrichment – leadership – types and theories of leadership – communication – process of communication – barrier in communication – effective communication.		
Unit V : Controlling:	8	CO5
System and process of controlling – budgetary and non-budgetary control techniques – use of computers and IT in Management control – Productivity problems and management – control and performance – direct and preventive control – reporting.		

Text Books	
1	Principles and Practice of Management: L M Prasad, Sultan Chand & Sons educational, New Delhi
2	Principles of Management, Ramaswamy T., Himalaya Publication

3	Essentials of Management, Harold Koontz, O'Donnell and Heinz Weihrich, 2012, New Delhi, 9th edition, Tata McGraw Hill
4	Fundamentals of Management, Stephen P. Robbins, David A. Decenzo, 2016, Pearson Education, 9th Edition
5	Management Today- Principles and Practice / Edition-13th reprint
Reference Books	
1	Management - Text & Cases, Satya Raju, PHI, New Delhi
2	Management Fundamentals: Concepts, Applications, & Skill Development, 6th edition, Sage, 2014
3	Principles Of Management, Richard L. Daft, Cengage Learning, 2009



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KDK College of Engineering, Nagpur

B. Tech.

CE/ ME/ EE/ CSE/ IT/ AI&DS/ ETC Engineering

Semester III	Subject Code: 3BOE01T - B	Name of Subject: Professional Practices & Ethics		
Total Distribution per week				
Total Credit: 3	Lecture (L): 3	Tutorial (T): 0		Practical (P): 0
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
20 Marks	30 Marks	50 Marks	100 Marks	3 Hrs

Course Objectives	
1	To understand the basic purpose of profession, professional ethics and various moral and social issues.
2	To analyze various moral issues and theories of moral development
3	To realize their roles of applying ethical principles at various professional levels
4	To identify their responsibilities for safety and risk benefit analysis.
5	To understand their constructive roles in dealing various global issues.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Understand basic purpose of profession, professional ethics and various moral and social issues.
2	Analyze various moral issues and theories of moral development.
3	Realize their roles of applying ethical principles at various professional levels.
4	Identify their responsibilities for safety and risk benefit analysis.
5	Understand their constructive roles in dealing various global issues.

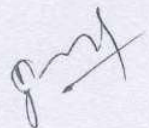
Course Competencies	
1	Apply professional ethics, moral values, and social responsibilities while dealing with real-world scenarios in their respective professions.
2	Analyze ethical issues critically and perform risk-benefit analysis to make informed and responsible decisions in professional settings.
3	Demonstrate responsible behaviour and actively contribute to addressing global and societal challenges through ethical and socially conscious practices.

CO_PO Mapping											
	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	-	-	-	-	2	3	1	1	-	3
CO2	-	2	-	-	-	-	3	-	1	-	2
CO3	-	-	-	-	-	-	3	1	2	-	1
CO4	-	-	2	-	2	-	2	-	-	-	3
CO5	-	-	-	-	-	3	3	1	1	-	3

Course Contents		Mapped with CO
Unit I : Human Values and Ethics:	8	CO1
Human Values, Morals, values and Ethics, Integrity, Work ethics, Service learning, Civic virtue, Respect for others, living peacefully, Caring, Sharing, Honesty, Courage		
Unit II : Engineering Ethics:	8	CO2
Engineering Ethics, Senses of 'Engineering Ethics', Variety of moral issues, Moral dilemmas, Moral Autonomy, Kohlberg's theory, Gilligan's theory		
Unit III : Engineering as Social Experimentation:	8	CO3
Engineering as Social Experimentation, Engineering as Experimentation, Engineers as responsible Experimenters, Codes of Ethics, A Balanced Outlook on Law (Industrial Disputes Act, 1947; 07 3 Industrial Employment (Standing Orders) Act, 1946; Workmen's Compensation Act, 1923		
Unit IV : Safeties, Responsibilities and Rights:	8	CO4
Safety, Responsibilities and rights, Safety and Risk, Assessment of Safety and Risk, Risk Benefit Analysis and Reducing Risk, Collective Bargaining, Professional Rights, Employee Rights		
Unit V : Global Issues and Professional Responsibilities:	8	CO5
Global issues, Multinational Corporations, Computer Ethics, Weapons Development, Engineers as Managers, Consulting Engineers, Engineers as Expert Witnesses and Advisors		

Text Book/ Reference Books	
1	Professional Ethics, R. Subramaniam, Oxford Publications, New Delhi.
2	Human Values and Professional Ethics by Jayshree Suresh and B. S. Raghavan, S. Chand Publications
3	Human Values & Professional Ethics by S. B. Gogate, Vikas Publishing House Pvt. Ltd., Noida.



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KDK College of Engineering, Nagpur

B. Tech.

CE/ ME/ EE/ CSE/ IT/ AI&DS/ ETC Engineering

Semester III	Subject Code:	Name of Subject:		
	3BOE01T - C	Insurance and Banking Management		
Total Distribution per week				
Total Credit: 3	Lecture (L): 3	Tutorial (T): 0		Practical (P): 0
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
20 Marks	30 Marks	50 Marks	100 Marks	3 Hrs

Course Objectives	
1	To introduce the structure and functioning of the banking industry, with a focus on commercial and corporate banking in India.
2	To understand key commercial banking operations and regulatory frameworks like KYC, AML, FEMA, and payment systems (NEFT, RTGS, SWIFT).
3	To explore banking risk management practices, including ALM, NPA management, credit risk, and other financial risks.
4	To provide insights into insurance fundamentals, types of insurance policies, and risk measurement techniques
5	To examine the operational aspects of insurance companies including underwriting and claims management.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Explain the structure and types of banking institutions in India and the concept of core and universal banking.
2	Describe key operations in commercial banking and apply regulatory norms such as KYC, AML, RTGS, NEFT, and FEMA.
3	Evaluate asset-liability management processes and prudential norms related to NPAs and credit risk management.
4	Illustrate the concepts and types of life and general insurance, and understand premium calculation and risk measurement.
5	Analyze the operational aspects of insurance companies including underwriting principles and claims settlement processes.

Course Competencies	
1	Understand the structure and regulations of banking and insurance in India.
2	Apply risk management practices and compliance frameworks like KYC, AML, FEMA, NEFT, and RTGS.
3	Analyze insurance policies and claims processes to evaluate financial and operational risks.

CO_PO Mapping											
	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	2	-	-	-	2	3
CO2	-	-	-	-	2	2	2	-	-	3	3
CO3	-	-	-	-	2	2	-	-	-	3	3
CO4	-	-	-	-	3	2	2	-	-	3	2
CO5	-	-	-	-	3	2	2	-	-	3	2

Course Contents		Mapped with CO
Unit I : Introduction to Banking: Banking Industry: Structure of Banking Industry - Public and Private Sectors Banks in India - Corporate Banking and Universal Banking - Core Banking Innovation in Banking: E-Banking - Delivery Channels - ATM - EFTPOS - Phone Banking - Internet Banking - SMS Banking - Mobile Banking - Credit/Debit Cards - Smart Cards - UPI - Bancassurance.	8	CO1
Unit II : Commercial Banking Operations: Banking Operations: Payment and Settlement System - New Age Clearing - New Age Payment - RTGS - NEFT - SWIFT - NTGS - KYC Norms and Anti - Money Laundering - FEMA. Asset Liability Management (ALM): Concept - Organization and Techniques - Provision for NPA's - NPA's in Commercial Banks - Causes and Suggestions - Prudential Norms.	8	CO2
Unit III : Management of Banking Organization: Credit Risk Management: Introduction - Capital Adequacy Norms - Standardized and Advanced Approaches for Credit Risk - Credit Rating/Credit Scoring - Rating System Design. Loan Management: Contents of Loan Policy - Evaluating Credit Applicant Market Risk - Liquidity Risk - Interest Rate Risk - FOREX Risk.	8	CO3

Unit IV Introduction to Insurance:	8	CO4
Introduction, Concept - Nature - Scope and Significance - Investment Patterns - Types of Policies. Life insurance: Premium Calculations - Annuities - Measurement of Risk and Morality Table. General Insurance: Fire Insurance - Conditions of Fire Insurance - Subrogation and Reinsurance - Accident and Motor Insurance - Types of Motor Insurance - Factors to be considered for Premium Fixing - Concept of Health Insurance - Group Insurance - Home Insurance - Catastrophe Insurance		
Unit V : Management of Insurance Companies:	8	CO5
Underwriting: Functions - Principles - Underwriting in Life Insurance - Underwriting in Non-Life Insurance. Claims Management: Claim Settlement in General Insurance - Accident Benefit - Disability Benefit - Permanent Disability Benefit - Claim Settlement in Life Insurance - Maturity Claims and Death Claims.		

Text/ Reference Books	
1	N.R. Mohan Prakash, Banking, Risk and Insurance Management, Vikas Publishing
2	M.N. Mishra & S.B. Mishra, Insurance: Principles and Practice, S. Chand & Co
3	Sunil Kumar, Essentials of Banking and Insurance, JSR Publishing House
4	Bank Management and Financial Services (Indian Edition), Peter Rose & Sylvia Hudgins, 8th Edition, McGraw Hill Education
5	Principles And Practice of Bank Management, 2nd Revised Edition, Dr. P. Subba Rao & Dr. Promod Kumar Khanna, Himalaya Publishing House



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KDK College of Engineering, Nagpur

B. Tech.

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Semester III	Subject Code:	Name of Subject:		
	3BOE01T - D	Total Quality Management		
Total Distribution per week				
Total Credit: 3	Lecture (L): 3	Tutorial (T): 0		Practical (P): 0
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
20 Marks	30 Marks	50 Marks	100 Marks	3 Hrs

Course Objectives	
1	Understand the principles, history, and key contributors of Total Quality Management (TQM)
2	Learn and apply essential quality tools like Kaizen, Six Sigma, and cost analysis.
3	Manage customer satisfaction, employee involvement, and supplier relationships.
4	Use quality improvement techniques such as control charts and the DMAIC process.
5	Apply advanced TQM tools like Benchmarking, QFD, TPM, and FMEA to enhance quality and reliability

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Develop an understanding about Quality management in corporate world.
2	Employ various techniques being used in Total Quality Management.
3	Engage into control of processes in manufacturing and operations
4	Audit control systems and Quality management
5	Apply TQM tools like Benchmarking, QFD, Taguchi Loss Function, TPM, and FMEA to improve quality and reliability in industrial and service processes.

Course Competencies	
1	Apply Total Quality Management (TQM) principles in real-world corporate settings.
2	Operate quality tools and techniques to improve processes and ensure product reliability.
3	Evaluate and audit quality systems to support continuous improvement.

CO_PO Mapping											
	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	-	2	-	2	1	-	-	-	1	1
CO2	-	2	2	-	3	1	-	-	-	2	2
CO3	-	2	3	-	2	1	1	2	-	2	2
CO4	-	2	2	2	2	1	1	-	-	2	2
CO5	-	2	3	-	3	1	1	-	2	2	2

Course Contents		Mapped with CO
Unit I: Introduction to Total Quality Management Introduction to Total Quality Management, A brief history, the concept of quality, evolution of total quality, principles of total quality, Gurus of total quality management, their philosophies and contributions, characteristics of quality leader, customer satisfaction, customer perception of quality, feedback, customer complaints.	8	CO1
Unit II: Tools of Quality Management Process, Problem solving method, Kaizen, Six Sigma, performance measures, Cost of Quality, Tools for Quality Assurance,	8	CO2
Unit III: Customers and Suppliers Management TQM Principles - Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement –Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy	8	CO3
Unit IV: Quality Improvement Techniques Quality Improvement Techniques - Control Charts for Variables – Definitions, Variation: Common vs. Special Causes, Process capability, Concept of six sigma - Introduction, advantages of six sigma, six sigma DMAIC process	8	CO4
Unit V: Total Productive Maintenance TQM Tools - Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA	8	CO5

Text Books	
1	Dale H.Besterfield, et al., Total Quality Management Pearson Education Asia, 1999. (Indian Areprint 2002)
2	Total Quality Management by Dale H. Besterfield,2019, Perason
Reference Books	
1	James R.Evans & William M.Lidsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5)
2	Feigenbaum.A.V. "Total Quality Management", McGraw-Hill, 1991
3	Oakland.J.S. "Total Quality Management" Butterworth – Heinemann Ltd., Oxford. 1989



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B. Tech.

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Semester III	Subject Code:	Name of Subject:		
	3BOE01T - E	Campus Sustainability		
Total Distribution per week				
Total Credit: 3	Lecture (L): 3	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
20 Marks	30 Marks	50 Marks	100 Marks	3 Hrs

Course Objectives	
1	Develop an understanding of the principles and practices of sustainability in the context of educational institutions.
2	Build awareness of ecological, economic, and social sustainability challenges on campuses.
3	Enable students to assess and reduce the environmental footprint of academic activities.
4	Introduce tools and strategies for energy, water, and waste efficiency within campuses.
5	Promote student engagement and leadership in sustainability initiatives.

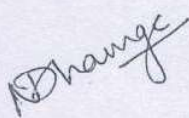
Course Outcomes	
After completion of syllabus, the student will be able to	
1	Explain the concept of sustainability and its relevance to campus ecosystems.
2	Evaluate current campus practices in energy, water, and waste management.
3	Analyze the application of green infrastructure and sustainable mobility in institutions.
4	Propose practical and technical strategies for improving campus sustainability.
5	Demonstrate environmental responsibility through individual and group actions.

Course Competencies	
1	Understand the concept of sustainability and its application to campus ecosystems.
2	Evaluate and improve energy, water, and waste practices within institutions.
3	Apply green infrastructure strategies and promote sustainable mobility on campuses.

CO_PO Mapping											
	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	3	3	-	2	-	2
CO2	-	-	-		-	2	3	-	-	2	2
CO3	-	-	-	2	-	2	2	-	2	2	2
CO4	-	-	-	2	-	2	2	-	2	3	2
CO5	-	-	-	-	-	2	3	3	3	2	-

Course Contents		Mapped with CO
Unit I: Foundations of Sustainability Introduction to sustainability: environmental, economic, social dimensions, The role of academic institutions in promoting sustainability, UN Sustainable Development Goals (SDGs) and Education for Sustainable Development (ESD), Examples of sustainable campuses worldwide	8	CO1
Unit II: Energy Management in Campus Infrastructure Campus energy audits: methods and case studies, Renewable energy integration: solar, wind, biomass, Energy conservation in labs, hostels, and classrooms, Smart grids, sensors, and building automation systems	8	CO2
Unit III: Water Conservation and Solid Waste Management Water audits and sustainable usage, Rainwater harvesting systems and greywater reuse, Solid waste segregation, composting, and recycling models, E-waste handling and hazardous waste precautions	8	CO3
Unit IV: Green Buildings and Sustainable Transportation Concepts of green building: LEED, GRIHA, EDGE certifications, Use of sustainable construction materials, Campus biodiversity and green landscaping Bicycle-friendly campuses, EV charging, carpool systems	8	CO4
Unit V: Community Engagement and Behavior Change Building a green culture through clubs and campaigns, Institutional policies and green charters, Sustainability reporting and auditing tools, Design and presentation of a campus sustainability project	8	CO5

Text book/Reference Books	
1	Geng, Yong, and Brent, Daniel. Sustainable Campus: Theory and Practice. Springer, 2021.
2	Agyeman, Julian et al. Local Environment: The International Journal of Justice and Sustainability (Selected papers)
3	United Nations. UN Sustainable Development Goals Reports – https://sdgs.un.org/
4	National Institute of Urban Affairs. Campus Sustainability Guidelines for Indian Institutions
5	AICTE & TERI Green Campus Manual (India-specific guidelines)

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B. Tech.

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Semester III	Subject Code: 3BOE01T - F	Name of Subject: Indian Stock Market		
Total Distribution per week				
Total Credit: 3	Lecture (L): 3	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
20 Marks	30 Marks	50 Marks	100 Marks	3 Hrs

Course Objectives	
1	Provide an in-depth understanding of the Indian capital and stock market structure.
2	Equip students with knowledge of equity, derivatives, mutual funds, and trading platforms.
3	Build analytical skills through fundamental and technical evaluation of securities.
4	Develop understanding of portfolio construction and investment strategies
5	Familiarize students with the regulatory framework, investor protection, and ethical investing

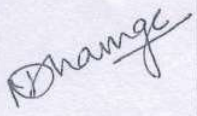
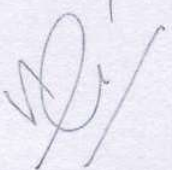
Course Outcomes	
After completion of syllabus, the student will be able to	
1	Explain the structure and functions of Indian stock markets and financial instruments.
2	Demonstrate knowledge of trading mechanisms and regulatory compliance.
3	Apply technical and fundamental analysis to evaluate investment opportunities.
4	Analyze and compare financial products like mutual funds, ETFs, and derivatives
5	Construct and manage a diversified portfolio applying key risk-return concepts.

Course Competencies	
1	Understand the structure and functions of the Indian stock market and its financial instruments.
2	Apply analytical tools and trading knowledge to evaluate investments and build portfolios.
3	Demonstrate understanding of regulatory compliance and ethical investing practices.

CO_PO Mapping											
	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	1	2	-	-	2	-	-	-	1	2
CO2	2	1	2	-	-	3	-	-	2	2	3
CO3	1	2	3	-	-	2	-	-	-	3	3
CO4	1	1	2	-	-	2	-	-	-	2	3
CO5	2	1	3	-	-	2	-	-	-	3	3

Course Contents		Mapped with CO
Unit I: Overview of Financial Markets & Stock Exchanges	8	CO1
Introduction to financial markets: Money vs. Capital market, Primary & Secondary markets, Stock exchanges in India: NSE, BSE, MCX, Role of SEBI and regulatory framework, Market participants: FIIs, DIIs, retail, HNIs Demat & Trading accounts, clearing & settlement (T+1 cycle)		
Unit II: Equity Market Instruments & Trading Mechanism	8	CO2
Types of securities: Equity, preference shares, debentures, IPO Process and Book Building, Market indices: Nifty, Sensex (construction & relevance), Order types: market, limit, stop-loss, Trading mechanisms: intraday vs. delivery, Circuit breakers, price bands, margin systems		
Unit III: Technical & Fundamental Analysis	8	CO3
Charts: Line, bar, candlestick, Patterns: head & shoulders, double top/bottom, triangles, Indicators: Moving Average, RSI, MACD, Bollinger Bands Fundamental analysis: P&L statement, Balance Sheet, Cash Flow Key ratios: EPS, P/E, ROE, Debt-equity ratio, DCF Model basics		
Unit IV: Derivatives and Mutual Funds	8	CO4
Introduction to Derivatives: Futures and Options, Hedging, speculation, arbitrage, Option chain, Greeks (basic understanding), Mutual funds: Types, NAV, SIP, SWP, AUM, ETFs and Index Funds, Fund selection and performance metrics		
Unit V: Portfolio Management & Regulatory Environment		
Risk-return analysis and investor profiling, Asset allocation & diversification strategies, Basics of portfolio construction, Regulatory bodies: SEBI, AMFI, NISM, Insider trading, corporate governance, taxation (STCG, LTCG), Investor protection and grievance redressal	8	CO5

Text Books	
1	Indian Financial System" By M. Y. Khan
2	McGraw Hill Education (Covers capital markets, SEBI, trading mechanisms, mutual funds)
Reference Books	
1	"Security Analysis and Portfolio Management" – S. Kevin, PHI Learning
2	"Fundamentals of Financial Markets" – V. A. Avadhani, Himalaya Publishing
3	"Fundamental Analysis for Investors" – Raghunathan V., McGraw Hill
4	NSE Academy Certified Capital Market Professional (E-NCCMP) modules
5	NISM Series: Equity Derivatives & Mutual Funds Distributor Study Material

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KDK College of Engineering, Nagpur

B. Tech.

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Semester III	Subject Code: 3BOE01T - G	Name of Subject: Climate Change		
Total Distribution per week				
Total Credit: 3	Lecture (L): 3	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
20 Marks	30 Marks	50 Marks	100 Marks	3 Hrs

Course Objectives	
1	Understand the scientific principles underlying climate change.
2	Explore the causes and evidence of global warming and climate change.
3	Analyze the impacts of climate change on ecosystems, societies, and economies
4	Examine national and international climate policies, treaties, and frameworks.
5	Identify engineering and technological strategies for climate mitigation and adaptation.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Explain the basic science of climate systems and greenhouse effect.
2	Interpret evidence and data supporting global climate change.
3	Assess environmental, social, and economic impacts of climate change.
4	Describe national and international responses and frameworks like UNFCCC, Kyoto Protocol, Paris Agreement.
5	Propose technological and policy-based solutions to mitigate and adapt to climate change.

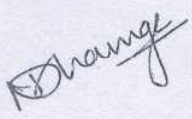
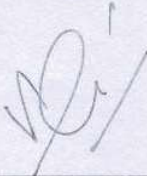
Course Competencies	
1	Inculcate the scientific basis of climate systems and global warming.
2	Analyze climate change impacts and interpret related environmental data.
3	Evaluate global climate policies and propose strategies for mitigation and adaptation.

CO_PO Mapping											
	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	2	-	-	-	-	-	-	-	-	2
CO2	-	3	-	2	2	-	-	-	-	-	3
CO3	-	2	-	-	3	2	-	-	2	2	-
CO4	-	-	-	-	3	3	-	-	-	2	2
CO5	-	2	3	2	2	3	3	1	1	2	-

Course Contents		Mapped with CO
Unit I: Climate Science Fundamentals	8	CO1
Earth's energy balance and the greenhouse effect, Natural vs anthropogenic causes of climate change, Role of carbon cycle and feedback mechanisms, Climate models and prediction tools		
Unit II: Evidence of Climate Change	8	CO2
Observed temperature and precipitation trends, Melting glaciers, sea-level rise, ocean acidification, IPCC reports and global climate data sources, Regional climate change patterns in India		
Unit III: Impacts of Climate Change	8	CO3
Environmental: biodiversity, forests, oceans, Social: health, migration, and agriculture, Economic: infrastructure, energy, and livelihoods, Case studies: floods, droughts, cyclones		
Unit IV: Climate Change Governance	8	CO4
Global treaties: UNFCCC, Kyoto Protocol, Paris Agreement, National policies: NAPCC, SAPCCs (India's response), Role of international bodies: IPCC, UNEP, COP summits, Climate finance and carbon trading		
Unit V: Mitigation and Adaptation Strategies	8	CO5
Renewable energy technologies and carbon capture, Sustainable urban and industrial design, Disaster-resilient infrastructure, Behavioral and lifestyle changes, Role of engineers in climate innovation		

Text Books	
1	1. Climate Change: From Science to Sustainability" by A. Barrie Pittock – Earthscan
2	"Global Warming: Understanding the Forecast" by David Archer – Wiley
3	"Introduction to Climate Change" by D. G. Martin – Oxford University Press

Reference Books	
1	IPCC Sixth Assessment Report (AR6) – https://www.ipcc.ch
2	India's National Action Plan on Climate Change (NAPCC) – https://moef.gov.in
3	"The Climate Solution" by Mridula Ramesh – Hachette India
4	UN SDG Goal 13 Reports – https://sdgs.un.org/goals/goal13

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KDK College of Engineering, Nagpur
B. Tech.
Entrepreneurship/ Economics/ Management (EEM)

Semester III/IV	Subject Code: 3BEM01T-A /4BEM02T-A	Name of Subject: Entrepreneurship Development		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	To enable the students to understand the concept of Entrepreneurship and to learn the Professional behaviour expected of an entrepreneur.
2	To identify significant changes and trends which create business opportunities and to analyze the environment for potential business opportunities.
3	To provide conceptual exposure on converting idea to a successful entrepreneurial firm
4	To provide information about various funding sources

Course Outcomes	
After completion of syllabus, the student will be able to	
CO1	Understand the basic concepts of entrepreneurship and business opportunities
CO2	Understands the ideas to develop & convert the successful business ideas
CO3	Understand & solve problems related to market, technical aspects & assessment of project feasibility
CO4	Prepare project reports for starting a new venture on team based & raising the funds for starting the business.

Course Competency	
1	Understand the fundamentals of entrepreneurship, its types, traits, cultural aspects, and challenges including the role of women and SHGs in economic development.
2	Develop the ability to recognize business opportunities, generate innovative ideas, and protect intellectual property through patents and IPR.
3	Evaluate and analyze business opportunities using tools like market, technical, cost-benefit, and network analyses to determine project feasibility.
4	Acquire skills to prepare business plans and understand funding options including.

Programme Outcome											
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	1	2	-	-	1	2
CO2	-	-	-	-	-	2	-	2	-	-	3
CO3	-	1	-	-	-	1	-	-	-	3	2
CO4	-	-	-	-	-	2	-	3	3	3	2

Details of Topic	Hours	Mapped CO
UNIT I: Entrepreneurship Entrepreneur: Meaning of entrepreneurship – Types of Entrepreneurships – Traits of entrepreneurship – Factors promoting entrepreneurship- Barriers to entrepreneurship- the entrepreneurial culture- Stages in entrepreneurial process – Women entrepreneurship and economic development- SHG.	7	CO1
UNIT II: Developing Successful Business Ideas Recognizing opportunities – trend analysis -- generating ideas – Brainstorming, Focus Groups, Surveys, Customer advisory boards, Day in the life research – Encouraging focal point for ideas and creativity at a firm level- Protecting ideas from being lost or stolen – Patents & IPR	7	CO2
UNIT III: Opportunity Identification and Evaluation Opportunity identification and product/service selection – Generation and screening the project ideas – Market analysis, Technical analysis, Cost benefit analysis and network analysis- Project formulation – Assessment of project feasibility- Dealing with basic and initial problems of setting up of Enterprises.	8	CO3

UNIT IV: Business Planning Process & Funding Meaning of business plan- Business plan process- Advantages of business planning- preparing a model project report for starting a new venture (Team-based project work). Sources of Finance- Venture capital- Venture capital process- Business angles- Commercial banks- Government Grants and Schemes.	8	CO4
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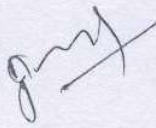
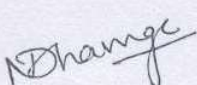
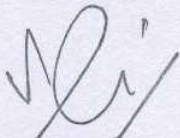
TEXT BOOKS:

1. Reddy, Entrepreneurship: Text & Cases - Cengage, New Delhi.
2. Kuratko/ Rao, Entrepreneurship: a south Asian perspective.- Cengage, New Delhi.
3. Leach/Melicher, Entrepreneurial Finance – Cengage. , New Delhi.
4. K. Sundar – Entrepreneurship Development – Vijay Nicole Imprints private limited
5. Khanka S.S., Entrepreneurial Development, S. Chand & Co. Ltd., New Delhi, 2001.
6. Sangeeta Sharma, Entrepreneurship Development, PHI Learning Pvt. Ltd., 2016.

REFERENCE BOOKS:

1. Barringer, B., Entrepreneurship: Successfully Launching New Ventures, 3rd Edition, Pearson, 2011.
2. Bessant, J., and Tidd, J., Innovation and Entrepreneurship, 2nd Edition, John Wiley & Sons, 2011.
3. Desai, V., Small Scale Industries and Entrepreneurship, Himalaya Publishing House, 2011.
4. Donald, F.K., Entrepreneurship- Theory, Process and Practice, 9th Edition, Cengage Learning, 2014.
5. Hirsch, R.D., Peters, M. and Shepherd, D., Entrepreneurship, 6th Edition, Tata McGraw-Hill Education Pvt. Ltd., 2006.



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KDK College of Engineering, Nagpur
B. Tech.
Entrepreneurship/Economics/Management (EEM)

Semester III/IV	Subject Code: 3BEM01T-B/ 4BEM02T-B	Name of Subject: Economics for Engineers		
	Total Hours Distribution per week			
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	Acquire knowledge of economics to facilitate the process of economic decision making
2	Acquire knowledge on basic financial management aspects
3	Develop the skills to analyze financial statements

Course Outcomes	
After completion of syllabus, the student will be able to	
CO1	Understand the concepts of economics and will also learn to use the principles of economics in the engineering discipline.
CO2	Develop the insight in understanding the consumer and production behavior and functioning of market economy.
CO3	Understand about interest Rates, Evaluation Methods and Rate of Return Analysis
CO4	Learn the implications of monetary and fiscal policies in Indian economy.

Course Competency	
1	Understand core economic principles, analyze market demand/supply, and apply elasticity concepts in decision-making.
2	Analyze firm behavior under different market structures and optimize production and cost strategies.
3	Apply time value of money principles and perform economic evaluation using present worth, annual worth, and IRR methods.
4	Evaluate key macroeconomic issues in India and understand monetary and fiscal policy tools to address them.

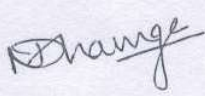
CO-PO Articulating Matrix

Programme Outcome and Programme Specific Outcomes											
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	-	2	-	-	-	-	2
CO2	2	2	2	-	-	3	-	-	-	-	2
CO3	2	-	3	-	-	-	-	-	-	2	2
CO4	2	3	-	-	-	3	2	-	-	-	2

Details of Topic	Hours	Mappe d CO
Unit I: Introduction and Demand Analysis Principles of economics, how markets work: market forces of supply and demand, Elasticity and its application, Consumer equilibrium	7Hr	CO1
Unit II: Theory of Production, Cost and Firms Firms' production, cost and revenue behavior; resources optimization; Firms' behavior under- competitive markets, monopoly, monopolistic competition and oligopoly.	8Hr.	CO2
Unit III: Engineering Economy Time value of money: Single-Payment and Uniform Series, Nominal and Effective Interest Rates, Evaluation Methods: Present Worth Analysis, Annual Worth Analysis, Rate of Return Analysis	7 Hr.	CO3
Unit IV: Indian Economy Nature and size of Indian Economy, Problems- Poverty, Unemployment, Inflation, measures for controlling these problems, Monetary policy- meaning, objectives, tools, fiscal policy-meaning, objectives, tools.	8 Hr.	CO4

Suggested Text Books

- N. Gregory Mankiw. Principles of Microeconomics,
- Krugman, Paul, and Robin Wells. Microeconomics. New York, NY
- WG Sulliman, EM Wicks and CP Koelling, Engineering Economy, Pearson
- Chan S Park, Fundamentals of Engineering Economics, Always Learning
- Anindya Sen, Microeconomics, OUP India
- Leland T. Blank & Anthony J. Tarquin, Engineering Economy, McGraw-Hill
- Hal R. Varian Intermediate Microeconomics, W. W. Norton and Company
- Ruder Dutt and Sundaram, Indian Economy, S. Chand

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KDK College of Engineering, Nagpur
B.Tech.
Entrepreneurship/Economics/Management (EEM)

Semester III/IV	Subject Code: 3BEM01T-C/ 4BEM02T-C	Name of Subject: Human Resources Management		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	To gain knowledge into the basics of Human Resource Management.
2	To expose the students to current human resource practices and exercises designed to enhance critical skills.
3	To expose the students to various aspects of human resource training & development
4	To impart knowledge on performance appraisal of employees

Course Outcomes	
After completion of syllabus, the student will be able to	
CO1	relate the significance of human resource management and examine the role of human resource development in the success of an organization.
CO2	understand the need for planning and process of acquisition of human resources for a firm
CO3	design a training program using a useful framework for evaluating training needs.
CO4	understand importance of performance appraisal and also understand different methods of doing it.

Course Competancy	
1	Understand the fundamental concepts, functions, and the dynamic environment of Human Resource Management, particularly in the Indian context.
2	Develop the ability to plan human resources through job analysis, job design, and HR planning systems and strategies.
3	Gain insights into recruitment, selection, and employee development practices, including modern training techniques and evaluation methods.
4	Analyze and apply various performance appraisal methods including individual, group, and modern techniques like MBO and 360-degree feedback.

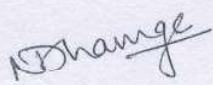
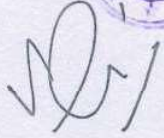
CO-PO Articulating Ma

Programme Outcome and Programme Specific Outcomes											
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	-	-	-	-	2	3	-	-	2	2
CO2	1	-	-	-	2	2	3	2	-	3	2
CO3	-	1	-	-	2	-	-	2	-	2	2
CO4	-	-	1	-	2	2	-	2	2	2	2

Details of Topic	Hours	Mapped CO
UNIT – I: INTRODUCTION Human Resource Management: Meaning – definition – objectives – functions. HRM in a dynamic environment: Internal & External Environment. HRM in India: Introduction - Human Relation Movement - Scope of HR in India - Recent Trends in HR in India - Call Centers and BPOs.	7	CO1
Unit – II HUMAN RESOURCE PLANNING Introduction - Need for HR Planning - Process of HR Planning - HR Planning System – Responsibility of HR Planner - Job analysis – Job description – Job evaluation- Job specification – Job design- (Case analysis)	7	CO2
Unit – III PROCUREMENT OF HUMAN RESOURCES, TRAINING AND DEVELOPMENT Introduction - Concept of Recruitment - Factors affecting Recruitment - Sources of Recruitment - Traditional and Modern Methods - Recruitment and Selection Policies - Recruitment Practices - Concept of Selection - Selection Techniques (Case Analysis) Training and Development: Introduction - Meaning of Training - Importance of Training - Training Needs –Types and Techniques of Training Need and Importance of Management Development -Evaluation of training programme (Case analysis)	9	CO3
Unit – IV EMPLOYEE PERFORMANCE APPRAISAL Meaning- Need of employee review - Concept of employee appraisal - Types of Appraisal methods - Individual Evaluation Methods - Multiple Person Evaluation Methods - MBO- 360 Degree Appraisal. CBCS – 2020	7	CO4

Suggested Text Books:-

1. Gary Dessler- Human Resource Management- Pearson Publishers
2. Alan Price- Fundamentals of Human Resource Management – Cengage Learning Emea
3. P. Subba Rao- Essentials of Human Resource Management and industrial relations- Text and cases - Himalaya Publishing House.
4. C.B. Mamoria- Personnel Management- Himalaya publications.
5. Shashi K. Gupta- Rosy Joshy- Human Resource Management- kalyani publishers.
6. Seema Sanghil-Human Resource Management- Publications CBCS – 2020

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KDK College of Engineering, Nagpur
B. Tech.
Entrepreneurship/Economics/Management (EEM)

Semester III/IV	Subject Code: 3BEM01T-D/ 4BEM02T-D	Name of Subject: Financial Management		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : --	Practical (P): - -
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	To introduce engineering students to the fundamental principles of financial management.
2	To help students understand financial statements, cost analysis, and budgeting.
3	To develop the ability to analyze financial data for decision-making.
4	To equip students with skills to evaluate investment and financing decisions.

Course Outcomes	
After completion of syllabus, the student is able to	
CO1	Explain the concepts and functions of financial management in business contexts.
CO2	Interpret and analyze financial statements to assess financial health.
CO3	Apply techniques for capital budgeting, cost of capital, and working capital management.
CO4	Evaluate various financing options and their implications for business decisions.

Course Competency	
1	Understand the fundamental concepts of financial management, time value of money, and analyze financial statements using ratio analysis.
2	Evaluate investment decisions using capital budgeting techniques like NPV, IRR, and understand risk in project selection.
3	Manage day-to-day business finances by understanding working capital components and financing strategies.
4	Identify various sources of finance, compute cost of capital, and apply capital structure and dividend policy theories.

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	-	-	-	-	2	-	-	-	2	1
CO2	-	2	-	-	1	2	-	-	-	2	2
CO3	1	-	-	-	-	-	-	-	-	2	2
CO4	-	-	2	-	-	2	-	-	-	3	2

Details of Topic	Hours	Mapped CO
Unit 1: Introduction to Financial Management and Analysis - Nature, Scope, and Objectives of Financial Management - Role of a Financial Manager in an Engineering Firm - Time Value of Money: Concepts and Calculations - Financial Statements: Balance Sheet, Income Statement, Cash Flow Statement - Financial Ratio Analysis	7	CO1
Unit 2: Capital Budgeting and Investment Decisions - Importance of Capital Budgeting - Techniques: Payback Period, Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index - Risk Analysis in Capital Budgeting - Capital Rationing and Ranking of Investment Proposals	7	CO2
Unit 3: Working Capital Management Concepts of Working Capital and Operating Cycle - Determinants of Working Capital Requirements - Cash, Inventory, and Receivables Management - Working Capital Financing	8	CO3
Unit 4: Sources of Finance and Cost of Capital - Equity and Debt Financing - Lease and Hire Purchase Financing - Cost of Capital: Cost of Debt, Equity, and Weighted Average Cost of Capital (WACC) - Capital Structure Theories and Leverage Analysis - Dividend Decisions and Policies	8	CO4

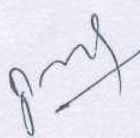
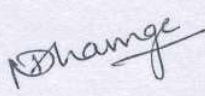
Textbook:

- I.M. Pandey, *Financial Management*, Vikas Publishing House, Latest Edition

Reference Books:

1. Prasanna Chandra, *Financial Management: Theory and Practice*, McGraw Hill
2. M.Y. Khan and P.K. Jain, *Financial Management: Text, Problems and Cases*, McGraw Hill
3. Eugene F. Brigham & Joel F. Houston, *Fundamentals of Financial Management*, Cengage Learning
4. James C. Van Horne & John M. Wachowicz, *Fundamentals of Financial Management*, Pearson Education



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KDK College of Engineering, Nagpur
B. Tech.
 (Ability Enhancement Course AEC-2)

Semester III/IV	Subject Code: 3BEM01T-E/ 4BEM02T-E	Name of Subject: Strategic Management		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	To enable the learners to understand new forms of Strategic Management concepts and their use in business
2	To provide information pertaining to Business, Corporate and Global Reforms
3	To develop learning and analytical skills of the learners to enable them to solve cases and to provide strategic solutions
4	To acquaint the learners with recent developments and trends in the business corporate world
Course Outcomes	
After completion of syllabus, the student will be able to	
CO1	Understand the basic concepts of entrepreneurship and business opportunities
CO2	Understands the ideas to develop & convert the successful business ideas
CO3	Understand & solve problems related to market, technical aspects & assessment of project feasibility
CO4	Prepare project reports for starting a new venture on team based & raising the funds for starting the business.

Course Competency	
1	Understand the foundational concepts of strategic management, its processes, levels, functional strategies, and environmental scanning.
2	Analyze, formulate, and evaluate corporate strategies using strategic tools like SWOT, BCG, and GE Matrix, and understand implementation challenges.
3	Understand corporate restructuring, renewal strategies, strategic alliances, and the role of IT and PPP in business growth.
4	Evaluate outsourcing models, disaster management strategies, and start-up policies like "Make in India" for entrepreneurial development.

CO-PO Articulating Matrix

Programme Outcome and Programme Specific Outcomes											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	-	-	-	-	3	2	-	-	2	3
CO2	-	2	-	-	-	2	-	2	-	2	2
CO3	1	-	1	-	-	1	-	-	-	3	2
CO4	-	-	-	2	-	2	-	3	3	3	2

Details of Topic	Hours	Mapped CO
Unit-I: Introduction to Strategic Management Concept of Strategic Management, Strategic Management Process, Vision, Mission and Goals, Benefits and Risks of Strategic Management. Levels of Strategies: Corporate, Business and Operational Level Strategy, Functional Strategies: Human Resource Strategy, Marketing Strategy, Financial Strategy, Operational Strategy, Business Environment: Components of Environment, Micro and Macro and Environmental Scanning.	7	CO1
Unit-II: Strategy Formulation, Implementation and Evaluation Strategic Formulation: Stages and Importance, Formulation of Alternative Strategies: Mergers, Acquisitions, Takeovers, Joint Ventures, Diversification, Turnaround, Divestment and Liquidation. Strategic Analysis and Choice: Issues and Structures, Corporate Portfolio Analysis- SWOT Analysis, BCG Matrix, GE Nine Cell Matrix, Hofer's Matrix, ETOP- Environmental Threat and Opportunity Profile, Strategic Choice- Factors and Importance. Strategic Implementation: Steps, Importance and Problems,	9	CO2

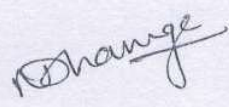
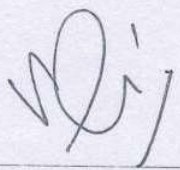
Resource Allocation- Importance & Challenges , Strategic Evaluation and Control: Importance, Limitations and Techniques ,Budgetary Control: Advantages, Limitations.		
Unit-III: Business, Corporate and Global Strategies Corporate Restructuring Strategies: Concept, Need and Forms, Corporate Renewal Strategies: Concept, Internal and External factors and Causes. Strategic Alliance: Concept, Types, Importance, Problems of Indian Strategic Alliances and International Businesses ,Public Private Participation: Importance, Problems and Governing Strategies of PPP Model. ,Information Technology Driven Strategies: Importance, Limitations and contribution of IT sector in Indian Business.	6	CO3
Unit-IV: Business Process Outsourcing and Knowledge Process Outsourcing in India: Concept and Strategies. Reasons for growing BPO and KPO businesses in India. Reengineering Business Processes- Business Reengineering, Process Re-engineering and Operational Re-engineering. Disaster Management: Concept, Problems and Consequences of Disasters, Strategies for Managing and Preventing disasters and Cope up Strategies. Start-up Business Strategies and Make in India Model: Process of business start-ups and its Challenges, Growth Prospects and government initiatives in Make in India.	8	CO4

Text Books:

- Strategic Management, A Dynamic Perspective -Concepts and Cases – Mason A. Carpenter, Wm. Gerard Sanders, Prashant Salwan, Published by Dorling Kindersley (India) Pvt Ltd, Licensees of Pearson Education in south Asia
- Strategic Management and Competitive Advantage-Concepts Jay B. Barney, William S. Hesterly, Published by PHI Learning Private Limited, New Delhi
- Globalization, Liberalization and Strategic Management - V. P. Michael

Reference Books:

- Business Organisation – Rajendra P. Maheshwari, J.P. Mahajan, Published by International Book House Pvt Ltd
- Disasters and Development- Cuny Fred C, Published by Oxford University Press, Oxford

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KDK College of Engineering, Nagpur**B. Tech.****Value Education Course (VEC)**

Semester III/IV	Subject Code: 3BVE01T-A 4BVE02T-A	Name of Subject: Environmental Studies		
	Total Hours Distribution per week			
Total Credit: 2	Lecture (L): 2 Hrs	Tutorial (T) : --	Practical (P): --	
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	A systematic study of human interaction with the environment in the interests of solving complex problems.
2	Study of physical and biological characters of the environment, also the social and cultural factors along with the impact of man on environment.
3	Bring together the principles of various disciplines of Sciences, to solve contemporary environmental problems.

Course Outcomes	
After completion of syllabus, the student is able to	
CO1	Understand the Multidisciplinary nature of environmental science and gain in-depth knowledge of natural processes that sustain life and govern economy.
CO2	Develop critical thinking for shaping strategies (scientific, social, economic and legal) for environmental protection and conservation of biodiversity, social equity and sustainable development.
CO3	Acquire values and attitudes towards understanding complex environmental-economic social challenges, and participating actively in solving current environmental problems and preventing the future ones.
CO4	Adopt sustainability as a practice in life, society and industry and know their roles and ethics, as citizens, and consumers in a complex, interconnected world.

Course Competency	
1	Applying the interdependence of environmental disciplines and importance of sustainable development.
2	Comprehend ecosystem dynamics, energy flow, and biodiversity types, values, threats, and conservation practices.
3	Analyze various types of pollution, hazards, and disasters. Apply EIA and auditing methods for sustainable environmental planning.
4	Evaluate the social dimensions of environmental problems and global agreements. Understand policy frameworks and ethics in sustainability.

CO-PO Articulating Matrix

Programme Outcome and Programme Specific Outcomes											
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	-	1	-	-	3	-	-	-	-	2
CO2	-	1	1	-	-	3	-	-	-	-	2
CO3	1	-	2	2	2	3	1	-	-	-	2
CO4	1	-	2	-	-	3	3	-	2	1	2

SYLLABUS

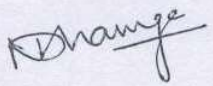
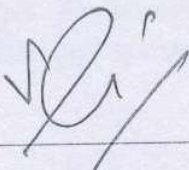
Details of Topic	Hours	Mapped CO
Unit – I Environment as a multidisciplinary subject and Natural resources Environment: Definition, Scope, basic terms, importance, need for public awareness, concept of sustainable development. Natural resources and associated problems. Forest, water, mineral, food and land resources. Role of individuals in conservation of natural resources. Equitable use of resources for sustainable lifestyle. Environmental Application of remote sensing and GIS	6	CO1
Unit – II Ecosystem and Biodiversity Ecosystem: Concept, Structure and Functions, Energy Flow, Food Chain, Food web, and Ecological Pyramids; Grassland and pond Ecosystem. Ecological succession. Biodiversity: Introduction, definition, Types (genetic, species & ecosystem). value of biodiversity, Biodiversity at Global, National and local Levels. Hot spots of biodiversity; Threats to biodiversity; conservation, In-situ and Ex-situ conservation; Relevant case studies, laws and Legislations.	8	CO2
UNIT-III: Environmental Pollution, hazards, Disaster management & EIA: Pollution: Definition, causes, effects and control measures of Water, Air, solid, noise and nuclear pollution. Environmental hazards & Disaster management: Definition, and types of mitigation. Preparedness and awareness. Environmental impact assessment (EIA); scope, importance and need. Role of IT in environment. Environmental Auditing; Relevant case studies, laws and Legislations.	8	CO3
Unit – IV Social Issues and Environment, Environmental conventions Population explosion, Urban problems related to energy, resettlement and rehabilitation of people, their problems and concerns, family welfare programme, human health, women and child welfare; environmental ethics & consumerism. Mass tourism and environment. Sustainable tourism. Stockholm convention, Kyoto Protocol, Montreal Protocol, COP Conference of Parties), Ramsar Convention, Rio Summit, Convention on Biological Diversity; National Green Tribunal; Relevant case studies, laws and Legislations.	8	CO4

Textbooks:

- 1.Environmenta Studies: ISBN: 8188458-77-5
- 2.Environmenta StudiesISBN-978-81-317-2118-6

Reference books:

- 1.Environmenta Studies Univ. Sci. PressISBN-978-81-318-0641-8
- 2.Environmenta Studie: ISBN: 8188458-77-5

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KDK College of Engineering, Nagpur
B. Tech.
Value Education Course (VEC)

Semester III/IV	Subject Code: 3BVE01T-B/ 4BVE02T-B	Name of Subject: Indian Constitution		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : 2	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25Marks	50 Marks	2Hrs

Course Objectives	
1	To impart a comprehensive outlook about the nature of the Indian Constitution
2	To identify the importance of Fundamental Rights and Fundamental Duties
3	To understand the Functioning of Union and State in Indian Federal System.

Course Outcomes	
After completion of syllabus, the students will be able to	
CO1	Interpret the Basic Concepts of Indian Constitution
CO2	Evaluate the Fundamental Rights and Fundamental Duties in proper sense
CO3	Analyze the Indian political system, the powers and functions of the Union and State Governments in detail
CO4	Learn about the Institutions of Indian Politics and to acquire a sense of Democratic System

Course Competency	
1	Explain the meaning and significance of the Constitution and its role in democratic governance
2	Identify the historical sources and development of the Indian Constitution.
3	Interpret the key features of the Constitution including citizenship, the Preamble, and core values.
4	Distinguish between Fundamental Rights, Fundamental Duties, and Directive Principles of State Policy

CO-PO Articulating Matrix

Programme Outcomes											
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	-	-	-	-	3	3	-	-	-	2
CO2	-	2	-	-	-	3	3	-	2	2	2
CO3	-	-	2	-	-	3	2	-	-	1	2
CO4	1	-	-	-	-	3	3	2	2	2	2

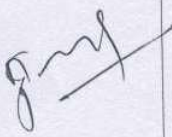
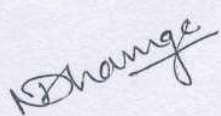
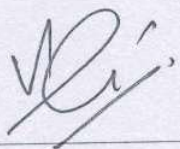
Details of Topic	Hours	Mapped with CO
Unit 1: Introduction	6	CO1
Constitution* meaning of the term,, Indian Constitution: Sources and constitutional history, Features: Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy		
Unit 2: Union Government and its Administration	6	CO2
Structure of the Indian Union: Federalism, Centre- State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha		
Unit 3: State Government and its Administration	6	CO3
Governor: Role and Position, CM and Council of ministers, State Secretariat: Organization, Structure and Functions		
Unit4: Local Administration	6	CO4
District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation, Pachayati Raj: Introduction, PRI: Zila Pachayat, Elected officials and their roles, CEO Zila Pachayat: Position and role, Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy		

Text Books

1. 'Indian Constitution' by D.D. Basu
2. 'Indian Administration' by Avasti and Avasti

References Books

1. 'Indian Polity' by Laxmikanth
2. 'Indian Administration' by Subhash Kashyap
3. Chakrabarty, Bidyut, Indian Government and Politics, New Delhi: Sage Publishing, 2008.
4. M. V. Pylee, India's Constitution, New Delhi; S. Chand Pub., 2017 (16th edn.)
J.N. Pandey, The Constitutional Law of India, Allahabad; Central Law Agency, 2018
(55th edition)

			June 2025	1.00	Applicable for AY 2025-26 onwards
BoS Chairman	Dean (Acad.)	Principal	Date of release	Version	



KDK College of Engineering, Nagpur**B. Tech.****Value Education Course (VEC)**

Semester III/IV	Subject Code: 3BVE01T-C/ 4BVE02T-C	Name of Subject: Civic Education		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	To explore how engineering practices influence societal development and responsibilities engineers hold towards the public.
2	To comprehend ethical principles and frameworks guiding engineers in making morally sound decisions.
3	To identify the standards of professional behavior expected from engineers, including accountability and continuous development.
4	To understand the legal obligations and rights of engineers, encompassing laws, regulations, and intellectual property considerations.

Course Outcomes	
CO1	Explain how engineering solutions affect communities and the environment, emphasizing sustainable and socially responsible practices
CO2	Utilize established ethical theories and codes to analyze and resolve moral dilemmas encountered in engineering scenarios.
CO3	Exhibit understanding of professional standards, manage conflicts of interest, and commit to lifelong learning within the engineering profession.
CO4	Identify and apply relevant laws and regulations affecting engineering practice, including contract law, liability, and intellectual property rights.

Course Competency	
1	Apply ethical theories, professional codes, and decision-making frameworks to real-world engineering dilemmas
2	Demonstrate professional conduct, manage conflicts of interest, and commit to lifelong learning in engineering.
3	Interpret and apply legal principles such as licensing, contracts, torts, and intellectual property in engineering.

CO-PO Articulating Matrix

Programme Outcome and Programme Specific Outcomes											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	2	2	-	-	3	-	-	-	-	-
CO2	-	-	-	-	-	-	2	2	-	-	-
CO3	-	-	-	-	-	-	3	-	-	2	3
CO4	-	-	-	-	-	2	2	-	-	2	-

Details of Topic	Hours	Mapped CO
UNIT – I: Engineers and Society: Articulate the multifaceted role of engineers within society, evaluate the societal implications of engineering project, and demonstrate an understanding of sustainable practices in engineering.	7	CO1
Unit – II Engineering Ethics and Moral Responsibility: Foundations of Engineering Ethics: Introduction to ethical theories and principles relevant to engineering, Codes of Ethics: Study of professional codes such as those from the NSPE and ASCE, Ethical Decision-Making: Frameworks for resolving ethical dilemmas in engineering contexts, Whistle blowing and Professional Integrity: Understanding the importance of honesty and reporting unethical practices.	7	CO2
Unit – III Professional Responsibility and Conduct: Professionalism in Engineering: Defining the standards and expectations of professional conduct, Accountability and Responsibility: Understanding the engineer's obligation to clients, employers, and the public, Conflict of Interest: Identifying and managing situations where personal interests may conflict with professional duties, Lifelong Learning: Emphasizing the importance of continuous professional development.	8	CO3

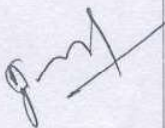
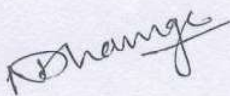
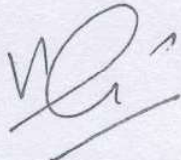
Unit – IV Legal Aspects in Engineering Practice: Engineering Laws and Regulations: Overview of laws governing engineering practice, including licensing requirements. Contract Law: Understanding contractual obligations and liabilities in engineering projects. Tort Law and Negligence: Exploring legal consequences of engineering failures and negligence. Intellectual Property Rights: Protecting innovations and respecting intellectual property of others.	8	CO4
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SUGGESTED TEXT BOOKS:

- 1) Ethics in Engineering by Mike W. Martin and Roland Schinzinger Panimalar Institute of Technology.
- 2) Engineering Ethics by Charles B. Fleddermann Panimalar Institute of Technology.

REFERENCE BOOKS:

- 1) Professional Responsibility: The Role of the Engineer in Society.
- 2) Engineering in Society" by the Royal Academy of Engineering Royal Academy of Engineering.

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KDK College of Engineering, Nagpur
B. Tech.
Value Education Course (VEC)

Semester III/IV	Subject Code: 3BVE01T-D/ 4BVE02T-D	Name of Subject: Gender Education		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continuous Assessment	End Semester Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	Understand fundamental concepts related to gender and their relevance in engineering contexts.
2	Analyse the social construction of gender and its impact on professional environments.
3	Evaluate gender disparities in various sectors, including education, employment, and technology.
4	Develop strategies to promote gender equity and inclusivity within engineering practices

Course Outcomes	
After completion of syllabus, the student is able to	
CO1	Differentiate between sex and gender, and explain related concepts such as patriarchy, gender roles, and stereotypes.
CO2	Assess the influence of social institutions on gender socialization and discrimination.
CO3	Critically examine gender issues within the Indian societal and educational context.
CO4	Propose and implement inclusive practices to address gender disparities in engineering fields.

Course Competency	
1	Understand diverse gender identities & to analyse biases and stereotypes.
2	Analyse how gender roles and discrimination are socially constructed and perpetuated through various institutions.
3	Examine the formation and reinforcement of gender roles in Indian society and assess legal and civil efforts for gender justice
4	Evaluate the role of education in shaping gender perceptions and propose strategies for inclusive, gender-sensitive pedagogy.

CO-PO Articulating Matrix

Programme Outcomes											
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	2	2	-	2	-	2
CO2	-	-	-	-	-	3	3	-	-	-	2
CO3	-	-	-	-	-	3	2	2	2	-	3
CO4	-	-	-	-	-	2	3	2	3	2	3

SYLLABUS

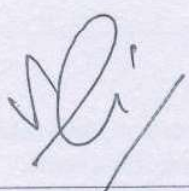
Details of Topic	Hours	Mapped CO
Unit 1 Understanding Gender Concepts Definitions of sex and gender. Key concepts: patriarchy, gender roles, stereotypes, and bias. Introduction to feminist theories: liberal, radical, Marxist, psychoanalytic, socialist. Understanding diversity within gender identities, including LGBTQ+ perspectives. Group discussions on gender perceptions in engineering. Case studies analyzing gender bias in technological developments	7	CO1
Unit 2 Social Construction of Gender: Gender socialization processes in family, education, and media. Gender discrimination in social institutions and life events. Concepts of gendered allocation of power and resources. Barriers to gender equity in professional settings, including the "glass ceiling" phenomenon. Role-playing exercises to understand gender dynamics in workplaces. Analysis of media representations of gender roles.	7	CO2
UNIT 3 Gender in Indian Society Construction of gender as a social category in Indian society. Reinforcement of gendered identities through institutions like family, religion, caste, and education. Emergence of movements for gender justice and the role of law and civil society. Constitutional provisions for gender equality and their implementation. Research projects on gender-based policies in India. Debates on the effectiveness of legal frameworks in promoting gender equity.	8	CO3
Unit 4 Gender and Education: Historical background of social and educational reform movements focusing on women's education. Analysis of gender issues in curriculum and pedagogical processes. Impact of National Curriculum Framework and National Education Policy 2020 on gender inclusivity. Strategies for integrating gender perspectives into engineering education. Curriculum review to identify gender biases. Workshops on developing gender-sensitive teaching materials.	8	CO4

SUGGESTED TEXTBOOKS:-

- 1) Gender and Development by Janet Momsen.
- 2) Gender: The Basics By Hilary M Lips

REFERENCE BOOKS:-

- 1) Ethics in Engineering by Mike W Martin & Roland Schinzinger
- 2) Human Values and Professional Ethics by R.R. Gour, R Sangal & G.P.Bagaria

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KDK College of Engineering, Nagpur

B. Tech.

Value Education Course (VEC)

Semester III/IV	Subject Code: 3BVE01T-E 4BVE02T-E	Name of Subject: Universal Human Values		
	Total Hours Distribution per week			
Total Credit: 2	Lecture (L): 2 Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Sem Examination	Continuous Assessment	End Sem Examination	Total Marks	Examination Duration:
15 Marks	10 Marks	25 Marks	50 Marks	2 Hours

Course Objectives	
1	To help students distinguish between values and skills, and understand the need, basic Guidelines, content and process of value education.
2	To help students initiate a process of dialog within themselves to know what they 'really want to be' in their life and profession.
3	To help students understand the meaning of happiness and prosperity for a human being.
4	To facilitate the students to understand harmony at all the levels of human living, and live accordingly.
5	To facilitate the students in applying the understanding of harmony in existence in their profession and lead an ethical life.

Course Outcomes	
After completion of syllabus, the student will be able to	
COI	Understand the significance of value inputs in a classroom and start applying them in their life and profession
COII	Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.
COIII	Understand the role of a human being in ensuring harmony in society and nature.
COIV	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

Course Competency	
1	Apply the concept, purpose, and methods of value education for personal growth and societal well-being.
2	Develop self-awareness and recognize the need for harmony between the Self and the Body.
3	Analyze the foundations of ethical human conduct and identify ways to address social disparities.
4	Apply ethical principles and right understanding to resolve issues in professional life and contribute to sustainable development.

CO-PO Articulating Matrix

Programme Outcome											
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	2	3	2	-	-	2
CO2	-	-	-	-	-	2	2	-	-	-	2
CO3	-	-	-	-	-	3	2	2	2	-	2
CO4	-	-	-	-	-	3	3	2	2	2	3

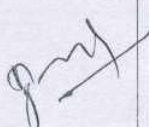
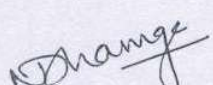
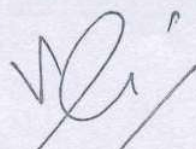
Details of Topic	Hours	Mapped CO
Unit – I Introduction to Value Education 1. Value Education- Definition, Concept and Need. 2. The Content and Process of Value Education. 3. Basic Guidelines for Value Education. 4. Self-exploration as a means of Value Education. 5. Happiness and Prosperity as parts of Value Education	7	CO1
Unit – II: Harmony in the Human Being 1. Human Being is more than just the Body. 2. Harmony of the Self ('I') with the Body. 3. Understanding Myself as Co-existence of the Self and the Body. 4. Understanding Needs of the Self and the needs of the Body. 5. Understanding the activities in the Self and the activities in the Body.	7	CO2
UNIT-III: Social Ethics 1. The Basics for Ethical Human Conduct. 2. Defects in Ethical Human Conduct. 3. Holistic Alternative and Universal Order. 4. Universal Human Order and Ethical Conduct. 5. Human Rights violation and Social Disparities.	8	CO3
Unit – IV Professional Ethics 1. Value based Life and Profession. 2. Professional Ethics and Right Understanding. 3. Competence in Professional Ethics. 4. Issues in Professional Ethics – The Current Scenario. 5. Vision for Holistic Technologies, Production System and Management Models.	8	CO4

TEXT BOOKS

1. A.N Tripathy, New Age International Publishers, 2003.
2. Bajpai. B. L., New Royal Book Co, Lucknow, Reprinted, 2004
3. Bertrand Russell Human Society in Ethics & Politics

REFERENCE BOOKS

1. Gaur. R.R. , Sangal. R, Bagaria. G.P, A Foundation Course in Value Education, Excel Books, 2009.
2. Gaur. R.R. , Sangal. R , Bagaria. G.P, Teachers Manual Excel Books, 2009.
3. I.C. Sharma . Ethical Philosophy of India Nagin & co Julundhar
4. Mortimer. J. Adler, – Whatman has made of man
5. William Lilly Introduction to Ethic Allied Publisher

			June 2025	1.00	Applicable for AY 2025- 26 onwards
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KDK COLLEGE OF ENGINEERING, NAGPUR
FACULTY OF SCIENCE AND TECHNOLOGY

B. TECH. (Electronics and Telecommunication Engineering)

Semester : III	Subject Code: 3BET03P	Name of Subject: Community Engagement Project	
Total Hours Distribution per week			
Total Credit: 2	Lecture (L):	Tutorial (T) : -	Practical (P): - 4hrs
Examination Scheme			
Continuous Assessment	End Sem Examination	Total Marks	
50 Marks	50 Marks	100 Marks	

Course Objectives	
1	To work effectively as part of a team, fostering collaboration, communication, and project management skills. This often involves working with peers, faculty, and industry professional.
2	To learn how to plan, execute, monitor, and complete a project within set deadlines and budget constraints, developing time management and organizational skills.
3	To understand and address ethical considerations and the social impact of engineering projects, promoting responsible and sustainable engineering practices.
4	To encourage innovative thinking and creativity in designing and implementing engineering solutions

Course Outcomes	
After completing the course, students will be able to	
CO1	Identify and analyze the social, economic, and environmental issues prevalent in the community.
CO2	Collaborate effectively with local communities and stakeholders to understand their needs.
CO3	Apply theoretical knowledge to plan, implement, and evaluate a project that addresses a real-world community issue.
CO4	Demonstrate leadership, teamwork, communication, and ethical responsibility while working on community-centered problems.

Course Competencies:

- Demonstrate sensitivity to societal challenges and recognize the role of citizens in contributing to sustainable community development.
- Analyze community issues using appropriate tools and methodologies to identify genuine needs and suggest feasible solutions
- Apply project management principles to design, plan, and implement community-based projects effectively
- Work effectively in diverse teams and engage respectfully with community members and stakeholders..

CO-PO Articulating Matrix:

CO	Program Outcomes & Program Specific Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3					3	3	3	3	2	3	3	3
CO2		2		1		3	3	3	3		3	3	2
CO3	3	2	2	1	2	2	2	2	1	2	2	2	2
CO4	3	2	2	2	2	2	2	3	2	3	2	3	2

Unit 1: Introduction to Community Engagement

- Concept and importance of community service
- Role of students in community development
- Ethics of engagement and understanding diversity

Unit 2: Problem Identification and Need Assessment

- Field visits and community interaction
- Data collection: surveys, interviews, observations
- Stakeholder mapping and needs assessment tools

Unit 3: Project Planning and Design

- Defining objectives, scope, and deliverables
- Resource allocation and budgeting
- Risk assessment and mitigation strategies

Unit 4: Project Implementation

- Executing the community project
- Team roles and responsibilities
- Interacting with community partners

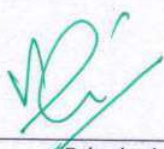
List of Field Projects Activities

- Use of Internet of Things(IoT) Devices for agricultural and social Welfare
- Water Quality Monitoring Systems: Sensors to monitor water quality parameters like pH, turbidity, and contaminants in local water bodies
- Traffic Management Systems: Smart traffic lights or congestion monitoring systems to optimize traffic flow and reduce congestion.

- Educational Electronics Kits: Low-cost educational kits or tools that teach basic electronics concepts to school students or hobbyists
- Community Communication Systems: Systems for emergency communication or local news dissemination in remote or underserved areas.
- Remote Sensing and Environmental Monitoring: Sensors and data logging systems for monitoring environmental parameters like air quality or forest fire risk
- Safety and Security Systems: Surveillance systems or alarms with IoT integration for enhancing community safety and security.

Note: 1) Make survey on any two topic.

2) Prepare report and Present in front of subject expert

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