

K. D. K. College of Engineering, Nagpur

Syllabus – Fourth Semester

Bachelor of Technology (Electronics and Telecommunication Engineering)

KDK COLLEGE OF ENGINEERING, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH. (Electronics and Telecommunication Engineering)

Semester IV	Subject Code: 4BET01T	Name of Subject: Microprocessor And Microcontroller		
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 provide comprehensive knowledge of 8-bit microprocessors (8085) and microcontrollers (8051).
2	To understand architecture, instruction sets, and programming using assembly language.
3	To design and implement microprocessor/microcontroller-based systems and applications.
4	To explore advanced microcontrollers such as ARM, PIC, and MSP430 with Embedded C and Arduino platforms.
5	To equip students with interfacing techniques with various peripherals.

Course Outcomes	
After completion of syllabus , students would be able to	
1	Describe the architecture and functioning of 8085 microprocessor.
2	Write and simulate assembly language programs for 8085 including interrupt handling.
3	Explain architecture and internal features of 8051 microcontroller.
4	Develop programs and interface 8051 with various peripheral devices.
5	Explain and compare features of advanced microcontrollers including ARM, PIC, MSP430 and Arduino platforms.

Course Competencies:

- Understand microprocessor and microcontroller architectures.
- Apply knowledge to design interfacing with peripherals.
- Develop assembly programs and debug systems.
- Analyze microcontroller-based embedded systems.

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	1	-	-	-	-	-	-	-	2	3	2
CO2	3	3	3	2	2	-	-	-	-	1	2	3	3
CO3	3	2	2	-	-	-	-	-	-	-	2	3	2
CO4	3	3	3	2	2	1	-	1	1	1	2	3	3
CO5	3	2	2	2	2	1	1	-	1	1	3	3	3

Syllabus

Unit	Details of Topic	Hours	CO Mapping
I	INTRODUCTION TO 8 BIT MICROPROCESSOR: Block diagram and operation of microcomputer system, Introduction to Intel's 8085 Architecture and its description along with functional pin diagram, organization of Memory in microcomputer system. Flag structure, Addressing Modes & Instruction set of 8085.	8	CO1
II	8085 PROGRAMMING IN ASSEMBLY LANGUAGE: Assembly Language Programming: Assembly language Programming and timing diagram of instructions; Concept of Interrupts and its structure and programming in 8085 & Interrupt service routines, timer/counter; Serial communication basics in 8085.	8	CO2
III	INTRODUCTION TO 8051 MICROCONTROLLER: Introduction to MCS51 family, microprocessor and microcontroller comparison, architecture of 8051, pin configuration and description, register organization, input/output port structure, timer structure and their modes, interrupts and serial port modes,	8	CO3
IV	8051 PROGRAMMING & INTERFACING: Addressing modes, instruction set, bit and byte level logical operations, programming of serial and parallel ports, timer/counters, and interrupts. Interfacing with 8051: Interfacing of LED, Seven segment, LCD, ADC, DAC, memory, DC and Stepper motor.	8	CO4
V	INTRODUCTION TO OTHER ADVANCED MICROCONTROLLERS: Introduction to ARM and PIC Processors of MSP 430 Microcontroller, 16 bit Micro-controllers overview; features, Architecture, Addressing Modes, Low power feature of MSP 430. Introduction to Embedded C and Arduino platform, Concept of digital and analog ports in Arduino.	8	CO5

Suggested Activities / Micro Projects:

Activity No.	Suggested Activity / Micro Project
1	Develop an 8085 program to perform arithmetic operations and display results using

	LEDs.
2	Design a traffic light control system using 8051.
3	Interface an LCD with 8051 to display sensor data.
4	Simulate 8051-based ADC data acquisition system.
5	Compare low-power features of MSP430 with Arduino through a real-time application.
6	Build an Arduino-based IoT sensor monitoring system.

Online Resources:

1. NPTEL Course: Microprocessors and Microcontrollers – Prof. S.Srinivasan, IIT Madras.
2. <https://www.tutorialspoint.com/microprocessor>
3. <https://www.electronicwings.com> – Arduino and 8051 tutorials.
4. <https://www.coursera.org/learn/arduino> – Introduction to Arduino IoT.

Teacher's Resources:

- Lab kits with 8085 trainer boards, 8051 development boards.
- Simulation tools: Keil μ Vision for 8051, Proteus Design Suite, Tinkercad, Arduino IDE.
- Data sheets of 8085, 8051, and MSP430 for in-depth instruction set and hardware study.
- Pre-recorded lectures and webinars from TI, ARM, and Arduino.

Text Books

1. Microprocessor, Architecture, Programming and Applications with 8085, Ramesh S. Gaonkar, 5th edition, Penram International Publication, 2004.
2. The 8051 microcontroller, Kenneth Ayala, 3rd edition, Delmar Cengage Learning 2005.
3. 8051 Microcontroller and Embedded System, Muhammad Ali Mazidi, 2nd edition, Prentice Hall, 2000
4. The AVR Microcontroller and Embedded Systems: A System Approach by Muhammad A. Mazidi, 1st Ed., PHI, 2013.

Reference Books:

1. 0000 to 8085 – Introduction to Microprocessor for Engineers and Scientists, P. R. Sridhar and P. K. Ghosh, 2nd edition, Prentice Hall India Ltd, 2005.
2. Introduction to Microprocessor, Aditya P. Mathur, 3rd edition, Tata McGraw-Hill, 2004.
3. Advanced microprocessors and Peripherals, A.K.Ray and K.M.Bhurchandi, 2nd edition, Tata McGraw Hill, 2008
4. Design with PIC microcontrollers, John B. Peatman, 1st edition, PHI, 1998

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KDK COLLEGE OF ENGINEERING, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH. (Electronics and Telecommunication Engineering)

Semester IV	Subject Code: 4BET01P	Name of Subject: Microprocessor And Microcontroller 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 impart hands-on experience in programming using Assembly Language for 8085 and 8051.
2	To implement data handling, arithmetic, logical, and control instructions on microprocessor/microcontroller platforms.
3	To introduce students to interfacing techniques with I/O peripherals and hardware control.
4	To build foundational skills for embedded system applications using microcontrollers.
5	To design simple embedded application systems like control and monitoring solutions.

Course Outcomes	
After completion of syllabus , students would be able to	
1	Write and execute Assembly Language Programs (ALP) for 8085 and 8051 microcontrollers.
2	Perform data manipulation and arithmetic operations using ALP.
3	Implement control flow, stack operations, and subroutine handling in assembly code.
4	Interface and control peripheral devices like LED, LCD, motors, and ADC/DAC.
5	Design and develop simple real-time microcontroller-based embedded application systems.

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	2	3	-	-	1	1	-	2	3	2
CO2	3	3	2	2	3	-	-	1	1	-	2	3	2
CO3	3	3	3	2	3	-	-	1	1	1	3	3	2
CO4	3	3	3	3	3	1	-	2	2	2	3	3	3
CO5	3	3	3	3	3	2	1	3	2	3	3	3	3

Contents/List of Experiments

Exp. No.	Topics / Experiment Description	Mapped CO
1	Write ALPs using 8085 and 8051	CO1
2	Data transfer operations – block move, exchange, sorting	CO2
3	Arithmetic operations (add, sub, mul, div, square, cube using lookup tables, multibyte ops)	CO2
4	Logical operations (Boolean, logical instructions, bit manipulations)	CO2
5	Find largest/smallest element in array	CO2
6	Sort array elements using bubble sort	CO2
7	Stack and Subroutine implementation	CO3
8	Serial communication concept	CO3
9	Delay subroutines using timers/counters	CO3
10	Interfacing: relays, ADC/DAC, LEDs, LCDs, keyboards, 7-seg, switches, motors	CO4
11	Implement microcontroller-based applications (e.g., temperature control system)	CO5

Suggested Activities / Micro Projects/Contents beyond Syllabus:

Activity	Suggested Activity / Micro Project
1	Temperature-controlled fan using LM35 and 8051.
2	Digital clock using RTC and LCD interface.
3	Traffic light controller using 8051 and LEDs.
4	Automatic door control system with IR sensor and stepper motor.
5	Serial data transmission of sensor readings to PC using UART.
6	LED pattern generation using delay subroutines and GPIO.

Online Resources:

- **NPTEL Courses:**
 1. Microprocessors and Microcontrollers – IIT Kharagpur
 2. Embedded System Design – IIT Madras
- **YouTube Channels:**
 1. ALL ABOUT ELECTRONICS
 2. Neso Academy (8051 & 8085 tutorials)
 3. Gate Smashers (Microcontroller Series)
- **Simulators & IDEs:**
 1. **8085 Simulator** – <https://8085simulator.org>
 2. **Keil μ Vision IDE** – For 8051 simulation
 3. **Proteus Design Suite** – Circuit simulation and hardware emulation
- **Datasheets & Docs:**
 1. 8085 Instruction Set PDF (Intel)
 2. 8051 User Manual (Atmel/Intel)

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. (Electronics and Telecommunication Engineering)

Semester: IV	Subject Code: 4BET02T	Name of Subject: Analog and Digital Communication (Theory)		
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 understand fundamental of Signals & analog modulation and demodulation techniques.
2	To study various digital modulation methods and their applications.
3	To analyze performance of communication systems in presence of noise.
4	To introduce source and channel coding principles.
5	To understand spread spectrum techniques and advanced digital communication concepts.

Course Outcomes	
After completion of syllabus , students would be able to	
1	Analyze fundamentals of Signals& amplitude modulation techniques and evaluate their power and spectral efficiency.
2	Analyze and compare angle modulation and pulse modulation techniques.
3	Evaluate the effects of noise on communication systems and explain radio receiver operations.
4	Apply digital modulation techniques and calculate performance metrics like bit error rate.
5	Implement source and channel coding methods and understand spread spectrum techniques.

Course Competencies:

- Students will be able to get the in-depth understanding of analog and digital communication fundamentals.
- Students will be able to perform the mathematical modeling and analysis of modulation systems.
- Students will be able to apply the coding and spectrum spreading techniques in practical systems.
- Students will be able to use of tools like MATLAB, Scilab for simulation of communication systems.

CO-PO Articulating Matrix:

CO	Program Outcomes & Program Specific Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PS01	PS02
C01	3	2	2	-	1	-	-	-	-	-	2	3	2
C02	3	3	2	1	1	-	-	-	-	-	2	3	3
C03	3	3	2	2	1	-	-	-	-	-	2	3	3
C04	3	3	3	2	2	1	-	1	1	1	3	3	3
C05	3	3	2	2	2	1	1	1	1	1	3	3	3

Syllabus

Unit	Details of Topic	Hours	COs
I	Amplitude Modulation & Demodulation with basics of signal & System: Definition and classification of signals, Elementary Signals, Basic signal operations, , Modulation, Need for modulation, Amplitude modulation & Demodulation, DSB-SC, SSB, VSB transmission, Modulation index, frequency spectrum and Power requirement.	8	CO1
II	Angle Modulation & Pulse Modulation: Angle modulation: Frequency modulation & Demodulation, modulation index, frequency spectrum, Pre emphasis and de-emphasis techniques, Phase modulation and its spectral characteristics. Generation and demodulation of PAM, PWM, PPM.	8	CO2
III	Noise and Receivers: Sources & types of noise, Signal to Noise ratio, noise calculations, and equivalent noise bandwidth. Basic receiver (TRF), Super heterodyne receiver, performance parameters for receiver such as sensitivity, selectivity, fidelity, image frequency rejection etc.	7	CO3
IV	Digital Modulation concepts: Block diagram of Digital communication system, Sampling Techniques, Pulse code modulation, Delta modulation, Matched filter receiver, probability of error, DPSK, BPSK, QPSK, MSK.	8	CO4
V	Source Coding & Channel Coding and Spread Spectrum Methods: Source coding theorem, Huffman coding, Convolution coding, distance properties, Viterbi algorithm, Fano algorithm. Study of PN sequences, Direct sequence method, Frequency hop method, Slow and Fast Frequency Hopping, applications of Spread spectrum, CDMA, OFDM	8	CO5

Online Resources:

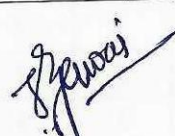
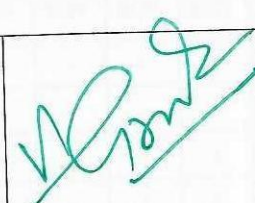
1. NPTEL – Communication Systems by Prof. S.C. Dutta Roy (IIT Delhi).
2. <https://www.electronics-tutorials.ws> – Modulation basics.
3. MATLAB & Simulink Communication System Toolbox documentation.
4. <https://nptel.ac.in/courses/108105102> – Digital Communication by IIT KGP.
5. Coursera: Digital Communication by University of California, Irvine

Textbooks:

1. Signal & Systems by Nagor Kani, Tata McGraw Hill Education Private Limited.
2. Electronic Communication System by Gorge Kennedy, 4th Edition, Tata McGraw-Hill.
3. Communication Systems by Simon Haykin, 2001, Tata McGraw-Hill
4. Digital communication by Simon Haykin, 2009 Reprint, John Wiley & Sons.
5. Digital communication by John G Prokis, 4th Edition 2000, Tata McGraw-Hill.

Reference books:

1. Signals and Systems – Alan V. Oppenheim & Alan S. Willsky, Pearson Education
2. Digital Communication by J.S. Chitode, 1st Edition, Technical Publications.
3. Modern Digital and Analog communications systems by B.P. Lathi, 4th edition, Oxford University.
4. Communication Systems Engineering, John G Prokis & M. Salehi, 2002, Pearson Education

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. (Electronics and Telecommunication Engineering)

Semester: IV	Subject Code: 4BET02P	Name of Subject: Analog and Digital Communication 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 provide hands-on experience with analog modulation and demodulation techniques.
2	To introduce students to pulse modulation schemes and their demodulation and to validate theoretical concepts like sampling theorem and delta modulation using practical circuits.
3	To demonstrate digital modulation techniques such as BPSK, QPSK, FSK, and MSK.

Course Outcomes	
After completion of syllabus , students would be able to	
1	Generate and analyze analog modulation techniques such as AM and FM.
2	Implement and evaluate pulse modulation schemes (PAM, PWM, PPM) and Validate sampling theorem and study delta/adaptive delta modulation schemes
3	Simulate and analyze digital modulation schemes including BPSK, FSK, QPSK, and MSK.

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	1	3	3	-	-	-	1	1	-	3	1
CO2	3	3	2	3	3	-	-	-	1	1	-	3	1
CO3	3	3	2	3	3	-	-	-	1	1	-	3	2

List of Experiments:

Any TEN Practicals to be performed

Exp. No.	List of Experiments	COs
1	Generate AM using different techniques; plot waveform	CO1
2	Generate FM using different techniques; plot waveform	CO1
3	Generate PAM; observe demodulated output	CO2
4	Generate PWM and study demodulation	CO2
5	Generate PPM and study demodulation	CO2
6	Validate Sampling Theorem	CO2

Exp. No.	List of Experiments	COs
7	Study Delta Modulator/Demodulator performance	CO2
8	Study Adaptive Delta Modulator/Demodulator	CO2
9	Generate & receive BPSK; perform spectral analysis	CO3
10	Generate & receive FSK; perform spectral analysis	CO3
11	Generate & receive QPSK; perform spectral analysis	CO3
12	Generate & receive MSK; perform spectral analysis	CO3

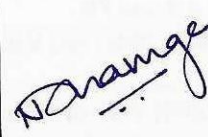
Online Resources:

- NPTEL Courses:

1. Analog Communication - IIT Kharagpur
2. Digital Communication - IIT Madras
3. Neso Academy
4. All About Electronics.
5. Easy Engineering Classes

- Simulators:

1. **MATLAB / Simulink** – For all modulation/demodulation techniques.
2. **Scilab + Xcos** – Open-source simulation environment.
3. **GNU Radio** – For SDR-based implementations.
4. **LTSpice / Multisim** – For hardware-level circuit simulation.

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. (Electronics and Telecommunication Engineering)

B.TECH. (Electronics and Telecommunication Engineering)				
Semester: IV SEM	Subject Code: 4BETMD02T	Name of Subject: Data Science & Machine Learning		
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 enable the Students with basic knowledge on Machine Learning Techniques.
2	To develop skills of applying Machine Learning Techniques for solving real world problems.
3.	Apply supervised and unsupervised machine learning algorithms for solving classification, regression, clustering, and recommendation problems.
4.	Analyze modern machine learning techniques, ensemble methods, and real-world applications to develop intelligent predictive solutions.
Course Outcomes	
After completion of syllabus, the student will be able to	
1	Understand basics of Machine Learning Techniques
2	Understand different types of Regression Techniques.
3	Be capable of applying classification techniques.
4	Apply unsupervised machine learning techniques & evaluate the machine learning techniques to real world problems.

Course Competency:

1. Develop a strong understanding of core Machine Learning concepts, including supervised and unsupervised learning techniques.
2. Students will gain proficiency in using Python and machine learning libraries to build, train, and evaluate predictive models.
3. Pre-process, analyse, and visualize datasets to improve the accuracy and reliability of machine learning solutions.
4. Apply classification, regression, and clustering algorithms to solve real-world data-driven problems.

CO-PO Articulating Matrix:

CO	Program Outcomes & Program Specific Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PS01	PS02
CO1	3	2	-	-	1	-	-	-	-	-	-	2	2
CO2	3	3	2	1	2	-	-	-	-	-	-	2	3
CO3	2	3	3	2	3	-	-	-	-	-	-	2	2
CO4	2	3	3	3	3	1	-	-	-	-	-	3	3

SYLLABUS:

Unit	Details of Topic	Hours	COs
I	Introduction to Data Science & Machine Learning: Data Science: What is Data Science, Applications of Data Science, Data Science lifecycle, Types of data: Structured, Unstructured, Semi-structured Machine Learning: Human learning & its types, Machine learning and its types (Supervised, Unsupervised reinforcement), Applications of Machine learning, issues in machine learning.	8	C01
II	Supervised Learning: Regression: Data pre-processing: Dimensionally reduction, feature subset selection, Types of regression: Multiple linear regression, Polynomial regression model	7	C02
III	Supervised Learning: Classification: Logistic regression, K-nearest neighbour (KNN), Naive Bayes Decision trees, Support vector machine. Recommendation Systems: Content based and collaborative techniques..	7	C03
IV	Component Interfacing & Networks & Trends and applications in Machine learning: Clustering, K-means clustering, Apriori algorithm and association rule, anomaly detection algorithm, Hierarchical clustering, K-Medoids. Ensemble learning, Bagging, randomization, Boosting, Applications of Machine learning: Image recognition, speech recognition, Prediction recommendation: email spam and malware filtering, virtual personal assistant, online fraud detection.	8	C04

Text Books:

1. Machine Learning by Subramanian Chandramouli, Saikat Dutt, Amit Kumar Das
2. Introduction to Machine Learning by Dr. Nilesh Shelke, Dr. Narendra V. Choudhary, Dr. Gopal Sakarkar, Das Ganu Publications. ISBN-978-93-84336-63-9
3. Machine Learning by Tom Mitchell, McGraw Publications

References Books:

1. Python Machine Learning Dr Randal S. Olson
2. Peter O'Neil, A Text Book of Engineering Mathematics, Thomson Asia Pvt. Ltd., Singapore.

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KDK College of Engineering, Nagpur

B. Tech.

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

Semester IV	Subject Code: 4BOE02T - A	Name of Subject: Corporate Social Responsibility		
Total Distribution per week				
Total Credit: 2	Lecture (L): 2	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
10 Marks	15 Marks	25 Marks	50 Marks	2 Hrs

Course Objectives

1	To introduce students to the concept, principles, and importance of CSR in business and society.
2	To help students understand ethical, environmental, and social challenges in corporate decision-making.
3	To explore CSR practices in India and globally, including legal and regulatory frameworks.
4	To develop students' ability to plan and evaluate CSR initiatives.

Course Outcomes

After completion of syllabus, the student will be able to

1	Define CSR and explain its significance in the modern business environment.
2	Evaluate CSR in different areas and implement the concept of TBL.
3	Analyze legal and ethical dimensions along with the planning and implementation of corporate responsibility.
4	Reflect on their own ethical responsibilities as future professionals and evaluate the CSR strategies and activities of Indian and global companies.

Course Competencies

1	Understand and apply the concepts, principles, and significance of CSR in business and society.
2	Evaluate CSR initiatives in various domains and analyze their ethical, legal, and environmental implications.
3	Reflect on their personal responsibilities as future professionals and contribute to sustainable and responsible corporate practices locally and globally.

CO_PO Mapping

Programme Outcomes

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

Course Contents		Mapped with CO
Unit I : Introduction to CSR: Definition, objectives, and Motives of CSR, Benefits and Internal scope of CSR, Historical evolution of CSR, CSR vs Corporate Philanthropy vs Corporate Governance, Stakeholders and CSR.	8	CO1
Unit II : CSR in Practice: Areas of CSR: environment, education, health, gender equality, community development, CSR and sustainable development goals (SDGs), Triple Bottom Line (People, Planet, Profit), Role of NGOs and media in CSR.	8	CO2
Unit III : CSR in India: Legal provisions under the Companies Act, 2013 (Section 135), CSR Rules and Amendments, Mandatory spending and reporting norms. CSR Planning and Implementation: Steps in CSR strategy formulation, Ethical dilemmas in CSR.	8	CO3
Unit IV Current trends and opportunities in CSR: CSR as a Strategic Business tool for Sustainable development. Review of successful corporate initiatives & challenges of CSR, Global frameworks (e.g., UN Global Compact, ISO 26000), Case studies of CSR by Indian companies (e.g., TCS, Infosys, Tata, Reliance).	8	CO4

Reference Books

- 1 Corporate Social Responsibility: Concepts and Cases" – C. V. Baxi and Ajit Prasad (Excel Books)
- 2 Corporate Social Responsibility in India" – Sanjay K. Agarwal (SAGE)
- 3 Business Ethics and Corporate Social Responsibility" – S.K. Bhatia
- 4 India CSR Report 2019: Trends and Prospects of CSR By Girija Srinivasan, Narasimhan Srinivasan, SAGE Publications

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KDK College of Engineering, Nagpur
Faculty of Science and Technology
B. Tech.

CE/ ME/ EE/ CSE/ IT/ AIDS/ ETC Engineering

Semester IV	Subject Code: 4BOE01T - B	Name of Subject: Life Skills		
Total Distribution per week				
Total Credit: 2	Lecture (L): 2	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
10 Marks	15 Marks	25 Marks	50 Marks	2 Hrs

Course Objectives	
1	To enable students to understand the significance of self-awareness and life skills.
2	To develop self-awareness, emotional intelligence, and to equip students with skills for stress and time management
3	To understand the importance of decision-making, and critical thinking.
4	To foster leadership skills, interpersonal relationships and teamwork.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Apply essential life skills for personal and professional development.
2	Develop self-awareness, emotional intelligence, and to equip students with skills for stress and time management
3	Learn and implement the decision-making, and critical thinking.
4	Apply leadership skills, interpersonal relationships and teamwork.

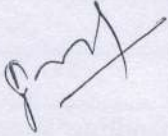
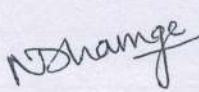
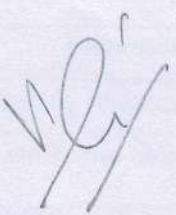
Course Competencies	
1	Understand and apply essential life skills for personal and professional growth.
2	Develop self-awareness, emotional intelligence, and time management for handling stress effectively.
3	Demonstrate sound decision-making, critical thinking, interpersonal relationships, and leadership abilities in real-life and professional situations.



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

Course Contents		Mapped with CO
Unit I : Introduction to Life Skills and Personal Development	8	CO1
Concept and importance of life skills, Types of life skills as defined by WHO, Role of life skills in personal and professional development, Value education and self-discipline, Life skills vs soft skills vs hard skills		
Unit II : Self-Awareness and Emotional Intelligence	8	CO2
Understanding self: SWOT analysis, Johari Window for self-assessment, Emotional Intelligence: Definition and domains (Goleman's model), Managing emotions and empathy, Stress and time management techniques		
Unit III : Decision-Making and Critical Thinking	8	CO3
Types and styles of decision-making, Problem-solving techniques and frameworks, Critical thinking process and tools (e.g., root cause analysis), Barriers to effective decision-making, Case studies and exercises		
Unit IV Leadership and Teamwork Skills:	8	CO4
Basics of leadership and leadership styles, Team building, group dynamics, Interpersonal relationships in personal and professional life, Conflict resolution and negotiation skills, Communication for effective teamwork		

Text/ Reference Books	
1	Barun K. Mitra, "Personality Development & Soft Skills", Oxford Publishers
2	David, A. Whetten and Kim S. Cameron. Developing Management S&Is. 8th ed. Pearson
3	Kalyana, "Soft Skill for Managers"; First Edition; Wiley Publishing Ltd,

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KDK College of Engineering, Nagpur
Faculty of Science and Technology
B. Tech.

CE/ ME/ EE/ CSE/ IT/ AIDS/ ETC Engineering

Semester IV	Subject Code: 4BOE02T - C	Name of Subject: Digital Marketing		
Total Distribution per week				
Total Credit: 2	Lecture (L): 2	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
10 Marks	15 Marks	25 Marks	50 Marks	2 Hrs

Course Objectives	
1	To understand the basic concept of Digital Marketing.
2	To comprehend the concept of Online Marketing.
3	To perceive the importance of social media platforms in Digital Marketing.
4	To learn and utilize social media as tools for digital marketing.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Understand the core concepts of Digital Marketing
2	Summarize the core concepts of Online Marketing.
3	Understand the social media platforms for business.
4	Apply the various tools of digital marketing

Course Competencies	
1	Understand and explain the fundamental concepts of digital and online marketing.
2	Demonstrate the ability to identify and use major social media platforms for business marketing purposes.
3	Apply key digital marketing tools and techniques effectively to develop and manage online marketing strategies.

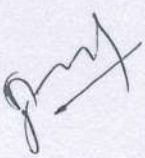
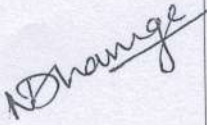
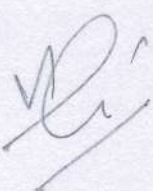
CO_PO Mapping											
	Programme Outcomes										
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	-	-	-	1	-	-	-	2	2
CO2	2	2	-	-	-	1	-	-	-	2	2
CO3	2	2	-	-	-	2	-	-	2	3	2
CO4	2	3	3	-	-	2	-	-	2	3	2

Course Contents	Hours	Mapped with CO
Unit I : Introduction to Digital Marketing: The Concept, Need & Evolution of Digital Marketing, Reason for growing importance of Digital Marketing in India, Digital Marketing: Types & Examples. Case Study on Digital Marketing	8	CO1
Unit II : Online Marketing: The concept of Digital Marketing Mix, 7 P's of Online Marketing: Product, Price, Promotion, Place People, Process, Physical evidence, Methods of Online Marketing promotion, Mobile Marketing & its types, concept of Email marketing, types of emails	8	CO2
Unit III : Social Media Marketing: Concept, Types of social media, social media for Business use, Facebook for Business, Developing Facebook Marketing Strategy Facebook Advertising, Instagram for advertisers-Marketing tools and Techniques, Instagram Best Practices Snapchat for Business, Twitter Usage for business, Terminology and Account Security, Advertising on Twitter, Twitter for Marketing, LinkedIn for Business, LinkedIn for Advertising, LinkedIn for Recruiters.	8	CO3
Unit IV Tools for Digital Marketing: Overview of Hootsuite: Dashboard and Features, Social Media Listening and Monitoring, Social Media Publishing and Scheduling. Campaign using Mailchimp: Overview of Mailchimp Features and Interface, Building Email Lists and Segmentation, Creating Email Campaigns: Templates and Content Design. Advertising tools: Google Ads, Canva Interface.	8	CO4

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 IV	Subject Code: 4BOE02T - D	Name of Subject: Basic of Mutual Fund		
Total Distribution per week				
Total Credit: 2	Lecture (L): 2	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
10 Marks	15 Marks	25 Marks	50 Marks	2 Hrs

Course Objectives	
1	To introduce students to the fundamental concepts, structure, and key terminology of mutual funds.
2	To provide an understanding of various mutual fund types, investment plans, and their suitability for different investor profiles.
3	To equip students with the ability to evaluate mutual fund performance and understand the investment process.
4	To familiarize students with the regulatory environment, tax implications, and emerging trends in mutual fund investment.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	1. Understand the structure, key components, features, and risks of mutual funds along with essential financial terms like NAV, AUM, and Expense Ratio.
2	Identify and compare various types of mutual funds and investment options, assessing their suitability based on different investor goals and profiles.
3	Evaluate mutual fund performance using key indicators (Sharpe Ratio, Alpha, Beta), and apply knowledge of fund selection and investment procedures.
4	Explain the regulatory framework of mutual funds, assess taxation aspects, and recognize current trends such as digital platforms and robo-advisors.

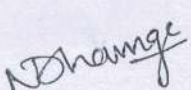
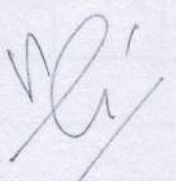
Course Competencies	
1	Understand and explain the structure, types, and objectives of mutual funds.
2	Interpret and analyze mutual fund performance indicators like NAV, risk, and return.
3	Demonstrate and develop the ability to select suitable mutual fund schemes based on investor profiles, financial goals, and regulatory guidelines.

CO_PO Mapping											
	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	-	-	-	2	-	-	-	2	1
CO 2	2	3	2	-	-	2	-	-	-	2	-
CO 3	2	3	3	-	-	2	-	-	-	3	1
CO 4	1	2	2	-	-	3	-	-	-	3	2

Course Contents		Mapped with CO
Unit I : Fundamentals of Mutual Funds	8	CO1
Expense Ratio Definition, Features, and Benefits of Mutual Funds, Limitations and Risks Associated, Structure of Mutual Funds: Sponsor, AMC, Trustee, Custodian, Key Terms: NAV, AUM, Exit Load, Expense Ratio		
Unit II : Types and Classification of Mutual Funds	8	CO2
Open-ended vs. Close-ended Funds, Types: Equity, Debt, Hybrid, Index Funds, ETFs, Investment Plans: SIP, STP, SWP, Suitability of Different Funds for Investor Profiles		
Unit III : Evaluation and Investment Process	8	CO3
Performance Indicators: Risk & Return, Sharpe Ratio, Alpha, Beta, Understanding Fund Fact Sheets and Ratings (CRISIL, Value Research), How to Invest: Online and Offline Methods, KYC Compliance and Investor Onboarding, Fund Selection Based on Financial Goals, Role of Fund Managers and Fund Houses		
Unit IV: Regulatory Framework, Taxation & Trends	8	CO4
Regulatory Bodies: SEBI and AMFI, Investor Protection Mechanisms and Grievance Redressal, Tax Implications: Capital Gains, Dividends, and ELSS Emerging Trends: Direct Plans, Robo-Advisors, Digital Platforms		

Text Books	
1	Mutual Funds in India: Structure, Performance and Regulations” By Amitabh Gupta – Oxford University Press

Reference Books	
1	Guide to Indian Mutual Funds” – CNBC TV18
2	“The Intelligent Investor” – Benjamin Graham (Chapters relevant to fund investing)
3	AMFI Study Material – Mutual Fund Distributors Certification
4	NISM Mutual Fund Foundation Certification Booklet

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KDK College of Engineering, Nagpur
Faculty of Science and Technology
B. Tech.

CE/ ME/ EE/ CSE/ IT/ AIDS/ ETC Engineering

Semester IV	Subject Code: 4BOE02T - E	Name of Subject: Introduction to Psychology		
Total Distribution per week				
Total Credit: 2	Lecture (L): 2	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
10 Marks	15 Marks	25 Marks	50 Marks	2 Hrs

Course Objectives	
1	Introduce the basic concepts and principles of psychology relevant to human behavior.
2	Familiarize students with psychological processes such as perception, learning, and memory.
3	Enhance self-awareness, emotional intelligence, and interpersonal effectiveness.
4	Apply psychological understanding to academic, professional, and everyday contexts.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Describe the scope, approaches, and applications of psychology.
2	Explain key psychological processes like attention, learning, motivation, and memory.
3	Demonstrate understanding of personality, emotional intelligence, and interpersonal skills.
4	Apply psychological insights to improve academic, professional, and social functioning.

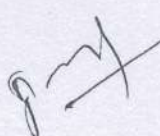
Course Competencies	
1	Understand and explain the fundamental concepts and psychological processes underlying human behavior.
2	Demonstrate awareness of self, emotional intelligence, and interpersonal effectiveness.
3	Apply psychological principles to enhance academic performance, professional development, and personal well-being.

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

Course Contents		Mapped with CO
Unit I: Introduction to Psychology Definition, nature, and goals of psychology, History and major schools: Structuralism, Functionalism, Behaviorism, Psychoanalysis, Humanism, Branches of psychology, Relevance of psychology to engineering and technology	8	CO1
Unit II: Cognitive and Emotional Processes Sensation and perception, Attention and learning (classical and operant conditioning), Memory and forgetting, Motivation and emotion: theories and types	8	CO2
Unit III: Personality and Intelligence Concept and assessment of personality (Freud, Big Five), Emotional intelligence and stress management, Types of intelligence and IQ testing, Self-awareness and self-regulation	8	CO3
Unit IV: Psychology in Real Life Application in academics: focus, time management, stress reduction, Group behavior, leadership, and communication, Conflict resolution and interpersonal relationships, Psychology at the workplace: motivation and productivity	8	CO4

Text Books	
1	"Introduction to Psychology" by Morgan, King, Weisz & Schopler – McGraw Hill
2	"Psychology" by Robert A. Baron – Pearson Education

Reference Books	
1	Understanding Psychology” by Feldman – McGraw Hill
2	Emotional Intelligence” by Daniel Goleman – Bantam Books
3	NPTEL & SWAYAM modules on Psychology (Govt. of India platforms)
4	Psychology: The Science of Behavior” by Carlson & Buskist – Pearson

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KDK College of Engineering, Nagpur

B. Tech.

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

Semester IV	Subject Code: 4BOE02T - F	Name of Subject: World Geography & Global Issue		
Total Distribution per week				
Total Credit: 2	Lecture (L): 2	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
10 Marks	15 Marks	25 Marks	50 Marks	2 Hrs

Course Objectives	
1	1. Build foundational knowledge of physical and political geography.
2	Enable analysis of the link between geography and global issues.
3	Foster understanding of demographic, environmental, and development challenges.
4	Develop spatial thinking, critical analysis, and global awareness.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Identify and describe key physical and political features of the world using maps.
2	Explain how geography influences cultural, political, and economic systems.
3	Analyze population trends, urbanization, and environmental issues from a global perspective.
4	Evaluate international policies and treaties addressing global challenges.

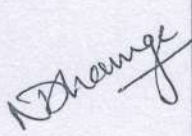
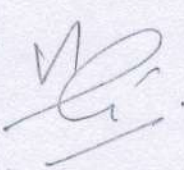
Course Competencies	
1	Understand and interpret key physical and political features of the world using spatial tools like maps.
2	Analyze the relationship between geography and global issues such as culture, politics, population, and the environment.
3	Apply geographic knowledge to critically evaluate global challenges and international responses.

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

Course Contents		Mapped with CO
Unit I: Fundamentals of Geography and Mapping	8	CO1
Scope of geography: physical and human, Latitude, longitude, and time zones, World continents, oceans, mountains, rivers, and deserts, Basics of maps, scales, and interpretation		
Unit II: World Regions and Geopolitical Dynamics	8	CO2
Global regional divisions: Asia, Europe, Africa, Americas, Oceania, Climate zones and ecosystems, Natural resource distribution and conflicts Case studies: boundary disputes and political geography		
Unit III: Population, Migration, and Urban Growth	8	CO3
Demographic indicators and population distribution, Migration trends and causes, Urbanization and challenges of megacities, Sustainable urban development		
Unit IV: Environmental Challenges and Global Governance	8	CO4
Global warming, biodiversity loss, pollution, Natural disasters and risk mitigation, UN Sustainable Development Goals (SDGs), Climate treaties: Paris Agreement, Kyoto Protocol, Role of UN, World Bank, WHO, WTO in global governance		

Text Books	
1	World Regional Geography: Global Patterns, Local Lives – Lydia Mihelic Pulsipher & Alex Pulsipher (Macmillan)
2	Global Issues: An Introduction – John L. Seitz & Kristen A. Hite (Wiley-Blackwell)

Reference Books	
1	Geography of the World – DK Publications
2	Environmental Geography – Savindra Singh
3	Global Problems and the Culture of Capitalism – Richard H. Robbins
4	World Bank Data Reports – https://data.worldbank.org/
5	United Nations SDG Reports – https://sdgs.un.org/

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KDK College of Engineering, Nagpur

Faculty of Science and Technology

B. Tech.

CE/ ME/ EE/ CSE/ IT/ AIDS/ ETC Engineering

Semester IV	Subject Code: 4BOE02T - G	Name of Subject: Intercultural Communication		
Total Distribution per week				
Total Credit: 2	Lecture (L): 2	Tutorial (T): 0	Practical (P): 0	
Examination Scheme				
Continuous Assessment	Mid Semester Examination	End Semester Examination	Total Marks	Examination Duration:
10 Marks	15 Marks	25 Marks	50 Marks	2 Hrs

Course Objectives	
1	To introduce foundational concepts and models of intercultural communication.
2	To explore the influence of cultural values, norms, and dimensions on communication behavior.
3	To develop verbal and non-verbal communication skills for effective cross-cultural interaction.
4	To equip students with strategies for managing intercultural barriers, conflicts, and enhancing global collaboration.

Course Outcomes	
After completion of syllabus, the student will be able to	
1	Define and explain the basic concepts, models, and significance of intercultural communication.
2	Analyze the impact of cultural frameworks and dimensions on communication styles.
3	Demonstrate verbal and non-verbal communication competence in multicultural settings.
4	Identify communication barriers and apply conflict-resolution strategies in diverse cultural contexts.

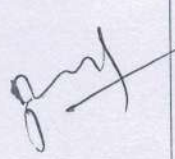
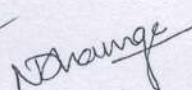
Course Competencies	
1	Understand and explain key concepts, models, and the role of culture in shaping communication behaviors.
2	Analyze and interpret cultural values, beliefs, and communication patterns across diverse societies.
3	Demonstrate and apply effective verbal and non-verbal communication strategies in multicultural environments.
4	Develop and use conflict resolution and collaboration skills in intercultural and global contexts.

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

Course Contents		Mapped with CO
Unit I: Fundamentals of Intercultural Communication	8	CO1
Definition and nature of intercultural communication, Importance in a globalized world, Basic models of communication (linear, transactional, interactive), Culture and communication: interdependence, Key terms: ethnocentrism, cultural relativism, stereotype, perception		
Unit II: Cultural Frameworks and Communication Styles	8	CO2
Hofstede's Cultural Dimensions (individualism vs collectivism, power distance, etc.), Edward T. Hall's High-Context vs. Low-Context Cultures, Value orientations and worldviews, Impact of cultural norms and beliefs on verbal communication, Case studies from global business and diplomacy		
Unit III: Verbal and Non-verbal Intercultural Competence	8	CO3
Verbal styles: direct vs. indirect, expressive vs. restrained, Non-verbal cues: kinesics, proxemics, paralanguage, haptics, Listening skills in intercultural contexts, Cross-cultural presentations and meetings, Role plays and practice in multicultural teams		
Unit IV: Barriers, Conflict Management & Global Collaboration	8	CO4
Types of intercultural communication barriers: linguistic, perceptual, attitudinal, Strategies for overcoming anxiety and uncertainty, Conflict resolution approaches across cultures, Building intercultural sensitivity and emotional intelligence, Intercultural competence in teams and organizations		

Text Books	
1	"Intercultural Communication in Contexts" – Judith N. Martin & Thomas K. Nakayama McGraw Hill Education, Latest Edition
2	Intercultural Communication: A Critical Introduction" – Ingrid Piller Edinburgh University Press

Reference Books	
1	Culture and Interpersonal Communication” – William B. Gudykunst & Stella Ting-Toomey
2	“The Culture Map” – Erin Meyer
3	“Bridging the Culture Gap” – Penny Carté & Chris Fox
4	NPTEL Course: Intercultural Communication by IIT Kharagpur

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

Semester: IV	Subject Code: 4BAE-01T-A	Name of Subject: Introduction to German Language		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continual Assessment	End Semester Examination	Total Marks	Examination Duration:
15	10	25	50	2

Course Objectives	
1	Information about life, Jobs, and Universities in Germany
2	Introduction to German culture

Course Outcomes	
After completion of syllabus, the students will be able to	
CO1	Understand everyday phrases and simple expressions
CO2	Use basic expressions in daily situations
CO3	Introduce yourself and other people
CO4	Ask and answer basic questions with confidence

Course Competency	
1	Develop grammatical accuracy and vocabulary for effective sentence construction and verbal expression.
2	Demonstrate effective communication in German language

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	-	3
CO2	1	-	-	-	-	-	-	1	3	-	3
CO3	-	-	-	-	-	-	-	1	3	-	3
CO4	-	-	-	-	2	-	-	-	3	-	3

SYLLABUS

Details of Topic	Hours	Mapped CO
Unit 1: Basic Grammar	6	CO1
The Alphabet		
Colors		
Number		
Family		
Body		
Clothing		
At home		
Food & Beverages		
Animals		
Professions		
Weather		
Leisure Time Activities		
Unit 2: Reading & Listening skills	8	CO2
Emotions & Adjectives		
Countries & Nations		
Means of Transport		
Conjugation Of Regular Verbs		
The Nominative		
Numbers		
Gender Rules		
Plural		
Irregular Verbs		
Formal Salutation		
Unit 3: Speaking & Writing skills	8	CO3
Word Order Of Main Clauses		
Separable And Inseparable Verbs		
Modal Verbs		
Negation		
How To Form Questions		
Conjunctions		
The imperative		
Pronunciation Rules		
How To Introduce Yourself		

Unit4: Soft Skills	8	CO4
How To Make Appointments		
Using Public Transport		
Looking For Apartments		
Asking For / Giving Directions		
How To Say The Time And Date		
Doctor's Visit		
How To Order Food In A Restaurant		

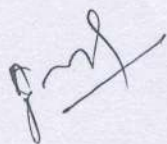
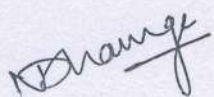
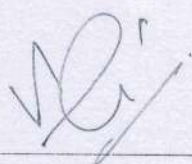
Text Books:

1. A course in Technical English, Cambridge, K N Shoba, D Praveen Sam.
2. Practical English Usage, Oxford, Michael Swan,
3. English Language and Communication skills for Engineers, Oxford, Sanjay Kuma /Pushp Lata,
4. Writing that Works, Kenneth Roman and & Joe Raphaelson

Reference Books:

1. Raymond Murphy – English Grammar in Use
2. G. Radhakrishna Pillai & K. Rajeevan – English for Employability
3. Meenakshi Raman & Sangeeta Sharma – Technical Communication: Principles and Practice



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BoS Chairman	Dean (Acad.)	Principal	Date of release	Version	

KDK College of Engineering, Nagpur

B. Tech.

(Ability Enhancement Course AEC-2)

Semester IV	Subject Code: 4BAE02T-B	Name of Subject: Stress 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 understand the nature and consequences of stress
2	To understand the impact of stress on work
3	To recognize the stressors, Adaptive and Maladaptive behaviour

Course Outcomes	
After completion of syllabus, the student will be able to	
CO1	Understand the cognitive variables of stress
CO2	Learn Managing Work-Life Balance
CO3	Understand role of communication and emotional intelligence, conflict management
CO4	Preparing for better future by reducing the stress using the various techniques

Course Competency	
1	Analyze cognitive and physiological aspects of stress and its effect on performance
2	Develop emotional intelligence and conflict management strategies
3	Promote well-being through lifestyle modifications and preventive practices.

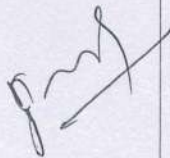
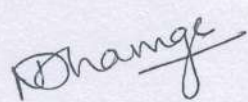
CO-PO Articulating Matrix

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

Details of Topic	Hours	Mapped CO
Unit – I Meaning and nature of stress: Difference between eustress and distress; Frustration, conflict and pressure; Meaning of stressors; Sources of stress (i) Psychological, Social, Environmental (ii) Academic, Family and Work stress common stressors at work place: Stressors unique to age and gender, stress Response- 'Fight or Flight' Response, Stress warning signals	8	CO1
Unit – II Cognitive appraisal of stress: General adaptation to stress; Consequences of stress; Physiological and psychological changes associated with the stress response. Stress and Memory; Stress and Other Cognitive Variables; Stressful environmental conditions on performance.	7	CO2
Unit – III Stress and Work performance: Role of communication in managing stress and work performance: Emotional regulation and coping; Emotional intelligence and conflict management: Emotional Basis and Stress; Stress and Conflict in Relationships.	7	CO3
Unit – IV Strategies of Stress Management and Preparing for future Coping Mechanisms- Coping Mechanisms: Appraisal focused, Emotional focused and Problem focused, Stress warning signals Care of the Self: Nutrition and Other Lifestyle Issues Stress reduction practices: Time management; Exercise; Relaxation techniques; yoga; meditation.	8	CO4

Suggested Text Books:

1. Baron. L & Feist. J (2000) Health Psychology 4th edition, USA Brooks/Cole
2. Barlow, Rapee, and Perini (2014), 10 Steps to Mastering Stress: A Lifestyle Approach, USA
3. Clayton, M, (2011). Brilliant stress management How to manage stress in any situation's 1st Edition, Great Britain Pearson Education
4. Cooper, C, & Palmer, S, (2000) Conquer Your Stress, London: Institute of personal Development Universities Press.

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

Semester IV	Subject Code: 4BAE02T-C	Name of Subject: Critical Thinking		
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 and apply fundamental principles of logical reasoning and argumentation.
2	Identify, analyze, and evaluate arguments and evidence in engineering contexts.
3	Develop problem-solving strategies using critical thinking methodologies.
4	Apply critical thinking skills to real-world engineering problems and case studies.

Course Outcomes	
After completion of syllabus, the student is able to	
CO1	Demonstrate the ability to construct and deconstruct arguments effectively.
CO2	Apply logical reasoning to identify and solve engineering problems.
CO3	Evaluate the credibility of sources and the validity of information in engineering scenarios.
CO4	Make informed decisions by integrating critical thinking with technical knowledge.

Course Competency	
1	Understand the core principles of critical thinking, identify elements of reasoning, and recognize logical fallacies and biases in engineering context
2	Apply deductive and inductive reasoning techniques and structured problem-solving frameworks to make logical engineering decisions.
3	Analyze engineering data and reports critically, assess risk and ethical concerns in technical decisions.
4	Integrate critical thinking into engineering design, promote collaboration, and adopt reflective practices for continuous improvement.

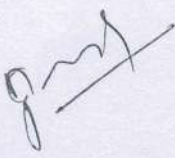
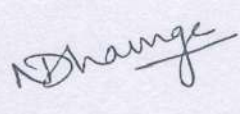
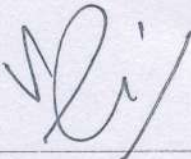
CO-PO Articulating Matrix

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

Details of Topic	Hours	Mapped CO
Unit I: Foundations of Critical Thinking: Introduction to critical thinking and its importance in engineering, Elements of reasoning: purpose, question, information, interpretation, concepts, assumptions, implications, and point of view, Common logical fallacies and cognitive biases.	8	CO1
Unit II: Logical Reasoning and Problem Solving: Deductive and inductive reasoning, Problem-solving frameworks: means-end analysis, root cause analysis, Decision-making models in engineering.	6	CO2
Unit III: Critical Analysis in Engineering Contexts: Evaluating technical reports and data, Assessing risk and uncertainty in engineering decisions, Ethical considerations and their impact on engineering solutions.	6	CO3
Unit IV: Application of Critical Thinking in Engineering Projects: Integrating critical thinking in the engineering design process, Collaborative problem-solving and communication, Reflective practices for continuous improvement.	8	CO4

SUGGESTED TEXT BOOKS:

1. Critical Thinking: A Student's Introduction, Gregory Bassham, William Irwin, Henry Nardone, James Wallace, Publisher: McGraw-Hill Education
2. Thinking Skills: Critical Thinking and Problem Solving by John Butterworth, Geoff Thwaites, Publisher: Cambridge University Press
3. Critical Thinking and Communication: The Use of Reason in Argument by Edward S. Inch, Barbara Warnick, Publisher: Pearson.

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KDK College of Engineering, Nagpur
B.Tech.
 (Ability Enhancement Courses AEC-02)

Semester III/ IV	Subject Code: 4BAE02T-D	Name of Subject: Employability Skills		
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 develop essential soft skills, including teamwork, leadership, and professional communication.
2	To enhance problem-solving abilities and aptitude skills relevant to engineering contexts.
3	To improve verbal communication, public speaking, and formal writing skills.
4	To prepare students for job interviews, resume writing, and other recruitment processes.

Course Outcomes	
After completion of syllabus, the student is able to	
CO1	Demonstrate effective teamwork and leadership qualities in professional settings.
CO2	Apply analytical and logical reasoning skills to solve complex problems.
CO3	Communicate proficiently in both verbal and written forms, suitable for professional environments.
CO4	Prepare impactful resumes and perform confidently in interviews.

Course Competency	
1	Develop essential soft skills including teamwork, leadership, professional networking, and interview preparation.
2	Apply quantitative, logical, and analytical reasoning techniques to solve aptitude-based problems effectively.
3	Enhance verbal communication, grammar, logical reasoning, and public speaking skills for professional scenarios.
4	Demonstrate proficiency in formal writing, digital communication, and professional etiquette in workplace settings.

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	3	3	3
CO2	-	2	-	-	-	-	-	1	1	2	3
CO3	-	-	-	-	-	-	-	-	3	3	2
CO4	-	-	-	-	-	-	-	-	3	2	2

KDK COLLEGE OF ENGINEERING, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH. (Electronics and Telecommunication Engineering)

Semester IV	Subject Code: 4BETVS01P	Name of Subject: Software Workshop	
Total Hours Distribution per week			
Total Credit: 2	Lecture (L): -	Tutorial (T) : -	Practical (P): 4 Hrs
Examination Scheme			
Continuous Assessment		End Sem Examination	Total Marks
50 Marks		50 Marks	100 Marks

Prerequisites:

1. Basic knowledge of fundamental programming concepts such as variables, data types, loops, conditional statements, functions, and arrays.
2. Basic understanding of at least C/C++ programming language.
3. Understanding of basic electronic components such as resistors, capacitors, inductors, diodes, and transistors.
4. Knowledge of Ohm's law, Kirchhoff's laws, and basic circuit analysis techniques.

Course Objectives	
1	To introduce basic programming skills in MATLAB for signal processing and mathematical applications.
2	To provide hands-on experience in analyzing electronic circuits using PSPICE.
3	To develop an understanding of waveform generation, plotting, and system modeling.
4	To strengthen circuit analysis and simulation skills with practical examples.

Course Outcomes	
After completion of syllabus , students would be able to	
1	Apply basic MATLAB programming concepts such as variables, vectors, matrices, and plotting for signal analysis.
2	Perform signal operations like convolution, scaling, shifting, and correlation using MATLAB.
3	Analyze and simulate basic electronic circuits like rectifiers, filters, and amplifiers using PSPICE.
4	Interpret frequency response and waveform behaviors of amplifiers and oscillators.
5	Design and verify waveform shaping circuits using PSPICE like clippers and clampers.

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	2	3	-	-	1	1	-	2	3	2
CO2	3	3	2	2	3	-	-	1	1	-	3	3	2
CO3	3	3	3	3	3	1	-	1	1	1	3	3	3

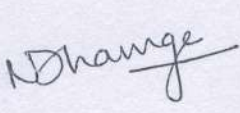
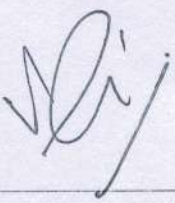
Details of Topic	Hours	Mapped CO
Unit I: Soft Skills Development: Teamwork: Importance, dynamics, and effective collaboration, Leadership: Initiating and managing change, problem-solving, and professional networking, Interview Preparation: Resume writing, digital profiles, video resumes, communication skills, and professional etiquette.	7	CO1
Unit II: Aptitude and Problem-Solving Skills: Quantitative Aptitude: Arithmetic, algebra, statistics, sequences, and series, Logical Reasoning: Clocks, calendars, cubes, non-verbal reasoning, and symbol-based reasoning, Data Sufficiency and Analysis: Techniques and practice questions, Time Management: Strategies for efficient problem-solving.	8	CO2
Unit III: Verbal Communication and Public Speaking: Vocabulary Enhancement: One-word substitutions and precise diction, Grammar and Sentence Improvement: Understanding and applying grammatical rules, Reasoning Skills: Syllogisms, critical reasoning, and logical sentence ordering, Reading Comprehension: Strategies for tackling advanced passages, Public Speaking: Overcoming glossophobia and effective audience engagement.	8	CO3
Unit IV: Professional Writing and Workplace Communication: Formal Writing: Email etiquette, job application letters, and professional correspondence, Report Writing: Structuring and presenting technical information, Digital Communication: Crafting effective digital profiles and understanding online professional presence, Workplace Etiquette: Understanding and practicing professional behavior and communication.	7	CO4

SUGGESTED TEXT BOOKS:

- 1) Employability Skills: Brush up Your Engineering by Clive W. Humphris
- 2) Soft Skills Training: A Workbook to Develop Skills for Employment by Frederick H. Wentz
- 3) Employability Skills Manual by Kalamazoo RESA Career & Technical Education.

REFERENCE BOOKS:

- 1) Life Skills for Engineers IV - Amrita Vishwa Vidyapeetham Amrita Vishwa Vidyapeetham.

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

Semester: IV	Subject Code: 4BAE-01T-E	Name of Subject: Technical English Writing		
Total Hours Distribution per week				
Total Credit: 2	Lecture (L): 2Hrs		Tutorial (T) : --	Practical (P): --
Examination Scheme				
Mid Semester Examination	Continual Assessment	End Semester Examination	Total Marks	Examination Duration:
15	10	25	50	2

Course Objectives	
1	To enable students to develop foundational grammar proficiency
2	To enhance students' reading comprehension, listening skills and Analytical ability
3	To improve students' spoken and written English skill
4	To cultivate essential workplace soft skills to enhance overall personality and employability.

Course Outcomes	
After completion of syllabus, the students will be able to	
CO1	apply rules of grammar, sentence structure, and vocabulary effectively.
CO2	interpret written texts analytically and demonstrate active listening skills.
CO3	express ideas clearly in spoken and written forms.
CO4	demonstrate professional behavior, conduct formal meetings, deliver effective short presentations.

Course Competency	
1	Develop grammatical accuracy and vocabulary for effective sentence construction and verbal expression.
2	Improve analytical reading and active listening skills for academic and professional comprehension..
3	Demonstrate effective public speaking and technical writing skills, including group discussions and reports..
4	Apply professional etiquette, self-presentation, and communication techniques in workplace scenarios.

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	-	3
CO2	1	-	-	-	-	-	-	1	3	-	3
CO3	-	-	-	-	-	-	-	1	3	-	3
CO4	-	-	-	-	2	-	-	-	3	-	3

SYLLABUS

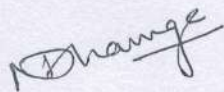
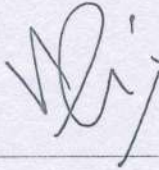
Details of Topic	Hours	Mapped CO
Unit 1: Basic Grammar	6	CO1
Subject -Verb Agreement, Errors in sentences (errors related vocabulary, preposition, pronoun)		
Transformation of sentence (types of sentences tenses, voice, degree, prepositions, articles,)		
Word formation, one word substitute		
Use of Phrases, Idioms & Proverbs (sentence construction)		
Unit 2: Reading & Listening skills		
Reading ability, types of reading, importance of reading	8	CO2
Reading Analytical comprehensions (Activity based)		
Introduction to Listening, Types, Importance, Barriers of listening		
Overcoming barriers of Listening, Audio (Creating Podcast & listening)		
Unit 3: Speaking & Writing skills	8	CO3
Public Speaking skills, types of speaking., Overcoming stage fear		
Techniques of Group Discussion & Interviews (Activity based)		
Techniques of written communication (essay & precis.).		
Features of Technical Writing, Technical Report writing (Accident, Feasibility, Trouble, Progress,) Writing Research papers.		
Unit 4: Soft Skills	8	CO4
Business etiquette, grooming, workplace etiquette,		
Self-assertiveness & Personality development		
Meeting & conference: Planning meeting, agenda, minutes, anchoring, report writing		
Short presentation (2-3 mins) on any topic. (Activity based)		

Text Books:

1. A course in Technical English, Cambridge, K N Shoba, D Praveen Sam.
2. Practical English Usage, Oxford, Michael Swan,
3. English Language and Communication skills for Engineers, Oxford, Sanjay Kuma /Pushp Lata,
4. Writing that Works, Kenneth Roman and & Joe Raphaelson

Reference Books:

1. Raymond Murphy – English Grammar in Use
2. G. Radhakrishna Pillai & K. Rajeevan – English for Employability
3. Meenakshi Raman & Sangeeta Sharma – Technical Communication: Principles and Practice

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CO4	3	2	2	3	3	1	-	1	1	1	3	3	3
CO5	3	2	2	2	3	1	-	2	1	1	3	3	2

Contents/List of Experiments

Exp. No.	Name of Experiment	Mapped CO
MATLAB		
1	Introduction to MATLAB: To define & use variables, vectors, Matrices & its functions in MATLAB. To study various arithmetic operators and mathematical functions in MATLAB. To create & use m-files.	CO1
2	Basic plotting of signals: To study various MATLAB commands for creating two and three dimensional plots. Write a MATLAB program to plot the following continuous time and discrete time Signals. i. Step Function ii. Impulse Function iii. Exponential Function iv. Ramp Function v. Sine Function	CO1
3	Write a MATLAB program to obtain linear convolution of the given sequences.	CO2
4	Write a MATLAB program to perform amplitude-scaling, time-scaling and time- shifting on a given signal.	CO2
5	Write a MATLAB program to obtain Cross correlation of sequences $x(n)$ and $y(n)$ & autocorrelation of a sequence $x(n)$ of the given sequences & verify the property.	CO2
PSPICE		
6	Verification of Half-Wave and Full-Wave Rectifier.	CO3
7	Verification of Low pass and High pass Filter.	CO3
8	Frequency Response of CE Amplifier.	CO4
9	Design of Wein-Bridge Oscillator.	CO4
10	Verification of Clippers & Clampers Circuits.	CO5

Suggested Activities / Micro Projects

Activity	Suggested Activity / Micro Project
1	Mini Project: Develop a MATLAB GUI to visualize standard signals and operations.
2	Simulation Project: Simulate an AM/FM transmitter circuit using PSPICE and study the output waveform.
3	Micro Task: Design a temperature sensor interface circuit and simulate with PSPICE.
4	Analytical Task: Compare the results of convolution using MATLAB and manually computed data.
5	Design Challenge: Create a clipping circuit to protect an amplifier from voltage spikes.

Online Resources:

- [MATLAB Official Documentation](#)
- [PSPICE User Guide by Cadence](#)
- [Signal Processing Tutorials – Coursera/edX](#)
- YouTube Channels:
 - **MATLAB & Simulink Training** – MathWorks
 - **All About Circuits** – PSPICE Simulation Examples

Reference books:

1. MATLAB Programming for Engineers, 6th edition Stephen J. Chapman, BAE Systems
2. Introduction To PSpice Using OrCAD For Circuits And Electronics e, Publisher: Pearson Education

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