B.Tech(Computer Science Engineering)
Semester-I(CSE-Plain, AI, BCT)

L-3,T-1,P-0,C-4

MAT 010:Introduction to Engineering Mathematics with Applications– I

Course Objective:

- To provide the students with sufficient knowledge in Differential Calculus, Integral Calculus and Vector Calculus this can be used in their respective fields.
- To Compare and contrast the ideas of limits continuity and differentiability.
- To find maxima and minima, critical points and inflection points of functions .
- To apply Stokes' theorem to compute line integrals along the boundary of a surface.
- To use Stokes' theorem to give a physical interpretation of the curl of a vector field.

Course Outcomes (COs)

1. Understand the concept of real functions, continuity and differentiability of functions.
2. Apply the concept of differentiation for successive differentiation.
3. Analyze the concepts of partial differentiation to evaluate Maxima and minima in engineering.
4. Evaluate integral,computations of area, surfaces and volumes for various engineering models.
5. Evaluate directional derivative line surface and volume integrals.

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	1	1	1	1	1	1	1	2	3	1
CO2	3	2	1	1	1	1	1	1	1	1	1	1	2	3	1
CO3	3	2	1	1	1	1	1	1	1	1	1	1	2	3	1
CO4	3	2	1	1	1	1	1	1	1	1	1	1	2	3	1
CO5															

High-3 Medium-2 Low-1

Unit I: Elementary Calculus **10 Hours**

Introduction of Functions, Concept of real function, types of functions, Composite functions, Continuity of function of one variable and its Properties, Differentiability, Rolle's theorem, Mean value theorems.

Unit II: Differential Calculus **10 Hours**

Successive differentiation, Leibnitz theorem, Expansion of functions (Maclaurin and Taylor series), Maxima and Minima of functions of one variable, Asymptotes, Curvature.

Unit III: Differential Calculus (Functions of several variables) **15 Hours**

Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation, Euler's theorem on homogeneous functions, Differentiation of implicit functions, Total differential coefficient, Transformations of independent variables, Jacobians.

Unit IV: Integral Calculus **15 Hours**

Basics of Definite Integral and its properties, Definite Integrals as a Limit of a sum, Application in summation of series, Beta Gamma function. Double and triple integrals, computations of area, surfaces and volumes, change of variables in double integrals - Jacobians of transformations, integrals dependent on parameters - applications.

Unit V: Vector Calculus **10 Hours**

Scalar and vector fields, level surfaces, directional derivative, Gradient, Curl, Divergence, theorems of Green, Gauss and Stokes

Total: 60 Hours

Reference Books:

1. Bressoud, D., Ghedamsi, I., Martinez-Luaces, V., &Törner, G. (2016). *Teaching and learning of calculus*. Springer Nature.
2. Kreyszig, E. 1999, Advanced Engineering Mathematics. John Wiley & Sons, New York.
3. Grewal, B. S., &Grewal, J. S. (1996). Higher engineering mathematics. *2002, Khanna Publishers, New Delhi*.Dass
4. Dass, H. K. (2019). *Advanced Engineering Mathematics, 22e*. S. Chand Publishing.

List of e-Learning Resources:

1. https://nptel.ac.in/
2. https://www.coursera.org/
3. https://www.youtube.com/watch?v=tffrrtzUhmw&list=PL7oBzLzHZ1wXBSiJEgqz_iwVoLiY8qhbv

B. Tech - Electrical & Electronics Engineering

Semester-I

24CSE0200 T: Transition from Physics to Electronics

Course Objectives

This course will expose students to –

- Define basics of the circuit's elements, construction and analysis of circuits.
- Understand the different methods to solve the circuits.
- Define the basics of the digital logics and circuits
- Develop the concepts about the electronics.
- Define fundamental energy storage elements.

Course Outcomes (COs)

- Understand the concepts of circuit abstraction and analysis of the circuit.
- Identify the different types of methods used to solve the networks.
- Design the digital logical circuits and solve Boolean expressions.
- Analyze the working of semiconductors and its types.
- Design and examine of working of energy storage elements.

Articulation Matrix

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CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	-	-	-	-	-	-	-	-	1	-	-	2	-
CO2	2	3	2	-	-	-	-	-	-	-	-	1	-	-	2	-
CO3	2	1	3	-	-	-	-	-	-	-	-	1	1	-	1	-
CO4	1	3	2	1	-	-	-	-	-	-	-	1	1	1	1	-
CO5	1	2	3	1	1	-	-	-	-	-	-	1	2	1	1	-

High-3 Medium-2 Low-1

Unit I — 09 Hours

Circuit abstraction & resistive networks :- Lumped circuit abstraction, limitations of the lumped circuit abstraction, practical two-terminal elements, ideal two-terminal elements, another ideal two-terminal element, Kirchhoff's laws, circuit analysis: basic method, intuitive method of circuit analysis: series and parallel simplification.

Unit II — 09 Hours

Network Theorems: - Nodal analysis and mesh analysis, superposition theorem, Thevenin's theorem and Norton's theorem, maximum power transfer theorem.

Unit III — 09 Hours

The Digital Abstraction: - Voltage levels and the static discipline, Boolean logic, combinational gates, standard sum-of-products representation, simplifying logic expressions, number representation.

Unit IV **09 Hours**

Semiconductors: - Structure of an atom, classification of materials - conductors, semiconductors and insulators, properties of semiconductor, types of semiconductors.

Unit V **09 Hours**

Energy Storage Elements: - Constitutive laws, series and parallel connections, special examples, transformers, energy, charge, and flux conservation.

PRACTICALS:-

1. To study and verify Kirchoff's current law.
2. To study and verify Kirchhoff's voltage law.
3. To study and verify Thevenin's theorem.
4. To study and verify Norton's theorem.
5. To study and verify maximum power transfer theorem.
6. To study and verify basic logic gates.
7. To study and verify universal logic gates.
8. To study and verify exclusive logic gates.
9. To study and verify De-Morgan's theorem.
10. To study series and parallel connections of resistors.

Total: 60 Hours

Reference(s)

1. Boylestad and Nashelsky: Electronic Devices and Circuit Theory, Pearson Education
2. Anant Agrawal and Jeffrey H. Lang: Foundations of AD Circuits

List of e-Learning Resources:

1. https://nptel.ac.in/
2. https://www.coursera.org/

Bachelor of Technology (Computer Science and Engineering)

Semester-I

L-2 T-1 P-2 C-4

24CSE0300 T - Introduction to Programming with C

Course Objectives

- To understand well-structured algorithms, flowcharts, and C programs for problem-solving.
- To learn and implement control structures, modular programming, and problem decomposition techniques using functions.
- To explore data structures such as arrays, strings, and structures to effectively solve computational problems.
- Apply the concept of pointers for efficient memory management and manipulation of data.
- Perform file handling operations and demonstrate the ability to manage input/output operations on files.

Course Outcomes (COs)

1. Understand the Fundamentals of C Programming, including syntax, data types, operators, and input/output operations.
2. Apply Control Structures for Problem-Solving, Implement appropriate control structures such as decision-making statements, loops, and branching
3. Apply the concepts of Arrays , Strings and memory management to solve real-world problems.
4. Apply functions and recursive techniques to develop Modular Programs.
5. Create some programs that use file management in C, and implement file handling techniques for reading from and writing to files, managing file operations

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

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

High-3 Medium-2 Low-1

UNIT I: INTRODUCTION TO C PROGRAMMING AND BASICS 09 Hours

Introduction to Computing: Introduction to Computer Systems, Art of Programming, Problem-Solving Techniques through Algorithms and Flowcharts, Introduction to Structured Programming, Types of Programming Languages.

Overview of C: History and importance of C, Characteristics of C, Basic Structure of a C Program, Steps in Executing a C Program, Compiling a Program through command prompt, configuring gcc and VS Code

Constants, Variables, and Data Types: Character Set, C Tokens, Keywords, Identifiers, Constants, Variables, and Data Types, Declaration of Variables, Assigning Values, Defining Symbolic Constants, Scope and Lifetime of Variables (Local, Global, Static).

Managing Input and Output Operations: Standard Input/Output Library Functions, Reading/Writing a Character, Formatted Input/Output (scanf, printf), Unformatted Input/Output (getchar, putchar).

Operators and Expressions: Arithmetic, Relational, Logical, Assignment, Increment/Decrement, Conditional, Bitwise Operators, and Special Operators.Expression Evaluation, Precedence, and Associativity of Operators, Type Conversions in Expressions (Implicit and Explicit).

UNIT II: CONTROL STRUCTURES AND MODULAR PROGRAMMING

09 Hours

Decision Making, Looping and Branching:

The IF Statement, IF-ELSE Statement, Nested IF-ELSE, ELSE IF Ladder, The switch Statement, The Ternary (? :) Operator, The goto Statement and its Drawbacks, Best Practices in Control Structures.
The while, do-while, and for Loops, Nested Loops, Loop Control Statements (break, continue), Early Exits from Loops (return, goto), Infinite Loops

Modular Programming:

Modular Approach, Code Reusability, Introduction to Header Files (#include, #define, macros).

UNIT III: ARRAYS, STRINGS AND MEMORY HANDLING 09 Hours

Arrays: One-dimensional Arrays: Declaration, Initialization, and Manipulation, Array Bounds Checking. Two-dimensional Arrays: Declaration, Initialization, Matrix Operations (Matrix Multiplication, Transpose, Determinant).

Strings: Declaring and Initializing String Variables, Reading/Writing Strings, Common String Operations, String Handling Functions (strlen, strcpy, strcmp, strcat).

Memory Handling and Dynamic Arrays: Introduction to Dynamic Memory Allocation (malloc, calloc, realloc, free), Advantages of Dynamic Memory, Use Cases.

Pointers: Declaration and Initialization of Pointers, Pointer Arithmetic, Pointers and Arrays, Pointers and Strings, Pointers to Functions, Double Pointers (Pointer to Pointer), Memory Management through Pointers.

UNIT IV: FUNCTIONS AND POINTERS 09 Hours

Functions: Definition and Declaration, Types of Functions (Built-in and User-defined), Function Arguments (By Value, By Reference), Scope and Lifetime of Variables in Functions, Recursive Functions, Passing Arrays/Strings to Functions, const Keyword Usage in Functions.

Pointers: Declaration and Initialization of Pointers, Pointer Arithmetic, Pointers and Arrays, Pointers and Strings, Pointers to Functions, Double Pointers (Pointer to Pointer), Memory Management through Pointers.

UNIT V: STRUCTURES, UNIONS AND FILE MANAGEMENT 09 Hours

Structures and Unions: Defining and Declaring Structures, Accessing and Modifying Structure Members, Array of Structures, Nested Structures, Understanding typedef with Structures, Introduction to Unions, Difference Between Structures and Unions, Bit Fields in Structures.

File Handling in C: File I/O: Opening, Reading, Writing, and Closing Files, File Modes (r, w, a, r+, w+, a+), Random Access to Files, File Pointers (fopen, fclose, fscanf, fprintf, fseek, ftell).

References

Text Books:

- “Problem Solving and Program Design in C” by Jeri R. Hanly and Elliot B. Koffman, Pearson Education, 8th Edition, 2016
- “C Programming Absolute Beginner's Guide" by Greg Perry and Dean Miller, Que Publishing, 3rd Edition, 2013
- “Let Us C” by Yashwant Kanetkar, 20th edition, BPB Publications, 2020
- **Reference Books:**
- "C: The Complete Reference" by Herbert Schildt, McGraw-Hill Education, 4th Edition (2000)
- "Head First C" by David Griffiths and Dawn Griffiths, O'Reilly Media, 1st Edition (2012)

List of e-Learning Resources:

Udemy: C Programming For Beginners

https://www.coursera.org/

Subject Tr. **Academic Coordinator** **HoD** **Sr. Faculty Nominated by DOAA**

Bachelor of Technology (Computer Science and Engineering)

Semester-I

L-2 T-1 P-2 C-4

CSE020 P - Introduction to Programming with C (B.Tech)

Course Objectives

- To understand well-structured algorithms, flowcharts, and C programs for problem-solving.
- To learn and implement control structures, modular programming, and problem decomposition techniques using functions.
- To explore data structures such as arrays, strings, and structures to effectively solve computational problems.
- Apply the concept of pointers for efficient memory management and manipulation of data.
- Perform file handling operations and demonstrate the ability to manage input/output operations on files.

Course Outcomes (COs)

1. Understand the Fundamentals of C Programming, including syntax, data types, operators, and input/output operations.
2. Apply Control Structures for Problem-Solving, Implement appropriate control structures such as decision-making statements, loops, and branching
3. Apply the concepts of Arrays , Strings and memory management to solve real-world problems.
4. Apply functions and recursive techniques to develop Modular Programs .
5. Create some programs that use file management in C, and implement file handling techniques for reading from and writing to files, managing file operations

Articulation Matrix

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

High-3 Medium-2 Low-1

1. Create a program that calculates the total electricity bill based on units consumed and different slab rates (e.g., 0-100 units at Rs. 5/unit, 101-300 units at Rs. 10/unit, etc.). Format the bill summary.
2. Write a program that prints a pyramid pattern using numbers. The height of the pyramid should be input by the user.

   1

   121

   12321

3. A perfect number is a number equal to the sum of its divisors, excluding itself. Write a program to check if a given number is perfect.
4. Write a program that simulates an ATM withdrawal process. The user enters an amount, and the program checks if the amount is divisible by 100 and less than the available balance, deducting it accordingly.
5. Write a program that takes marks of students stored in an array and calculates the average, maximum, and minimum marks using pointers.
6. Write a program that finds the second-largest element in an array using pointer notation for array traversal.
7. Write a program that takes a string as input and counts the frequency of each character in the string.

8. Write a recursive function to generate the first n terms of the Fibonacci sequence.
9. Write a program that calculates the monthly EMI (Equated Monthly Installment) for a loan based on the principal amount, interest rate, and loan tenure using functions. Implement separate functions to calculate the EMI, total interest, and total payment.
10. Write a program that calculates income tax based on a given income and tax brackets using functions. Different tax slabs apply depending on the income, and the program should calculate the total tax owed.
11. Write a program that maintains student records using structures. The program should allow adding new student details (name, roll number, marks) and saving the data in a file. It should also retrieve and display records when needed.

    Example Features:

- Add a student
- Retrieve student details by roll number
- Save records in a file

12. Implement a hospital management system using structures to store patient details (name, age, disease, treatment). The program should allow adding new patients, updating their details, and saving the data to a file.

    Example Features:

- Add new patient
- Update patient treatment
- Save and load patient data from a file

13. Create a structure to manage an online store's inventory. The program should store product details (name, price, stock) and allow users to add items to the cart. Implement file handling to maintain product information and user transactions.

    Example Features:

    b. Add products to the inventory
    c. Update product stock after a purchase
    d. Save transaction history to a file

14. Implement a system that stores movie details (name, time, available seats) using structures. Users can book tickets, and the data is saved to a file.

15. Write a program that dynamically allocates memory for an integer array using malloc(). Then, ask the user if they want to increase the size of the array. If yes, use realloc() to extend the array and allow the user to input more values. Finally, print the updated array.

References

Text Books:

References

Text Books:

- "Problem Solving and Program Design in C" by Jeri R. Hanly and Elliot B. Koffman, Pearson Education, 8th Edition, 2016
- "C Programming Absolute Beginner's Guide" by Greg Perry and Dean Miller, Que Publishing, 3rd Edition, 2013

- “Let Us C” by Yashwant Kanetkar, 20th edition, BPB Publications, 2020

Reference Books:

- "C: The Complete Reference" by Herbert Schildt, McGraw-Hill Education, 4th Edition (2000)
- "Head First C" by David Griffiths and Dawn Griffiths, O'Reilly Media, 1st Edition (2012)

List of e-Learning Resources:

Udemy: C Programming For Beginners

https://www.coursera.org/

Subject Tr. **Academic Coordinator** **HoD** **Sr. Faculty Nominated by DOAA**

I Year I Sem
Indian Traditions and Language Skills-Practical (CSS120-P)

L0 T0 P2 C1

Course Objectives: This course will enable students to:

1. Develop ability to analyze themes, and literary devices, fostering critical thinking and interpretation skills.
2. Enhance contemporary perspectives, facilitating a deeper understanding of cultural and societal evolution.
3. Develop the ability to critically assess and interpret information from diverse sources.

Course Outcomes (COs): Upon completion of this unit students will:

CO1: Apply reading, writing and interpretation skills of themes in literature, and contemporary issues.
CO2: Apply comprehension skills on technical communication.
CO3: Apply basic language skills in vocabulary building and basic grammar.

Articulation Matrix
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CO / PO / PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4
CO1	-	2	-	-	-	-	-	-	-	3	1	-	-	-	-	-
CO2	-	-	-	1	-	-	-	-	2	3	-	-	-	-	-	1
CO3	-	-	-	-	-	1	-	-	2	3	-	1	-	-	-	-

Practical Topics

1. Analyzing themes in literature
2. Exploring historical texts and their relevance
3. Understanding contemporary issues through written texts
4. Interpreting technical articles and research papers
5. Debating technology and its impact on society
6. Presenting technical information effectively
7. Engaging in group discussions.
8. Practicing oral presentations.
9. Conducting mock interviews.
10. Collaborative writing projects.

30 Hours

Reference(s)

1. "Understanding Indian Culture & Values" by D.R. Saini
2. "Indian Cultural Heritage" by N.K. Singh
3. "Introduction to Indian Culture" by Bipin Chandra Pal
4. "Indian Culture, Art and Heritage" by Nitin Singhania
5. "Indian Culture: An Introduction" by K.M. Pannikar
6. “English Grammar in Use” by Raymond Myrphy

7. “Vocabulary in Use” by Michael McCarthy and Felicity O’Dell

List of e-Learning Resource

Unit 1: Introduction to Indian Culture

- "[Rabindranath Tagore's Where The Mind is Without Fear Poem Analysis]"(https://poemanalysis.com/rabindranath-tagore/where-the-mind-is-without-fear/) - Analysis of the poem for deeper understanding.
- "[Rabindranath Tagore Biography]"(https://www.poetryfoundation.org/poets/rabindranath-tagore) - Learn more about the author and his cultural context.
- "[Diwali: The Festival of Lights]"(https://www.britannica.com/question/How-is-Diwali-celebrated) - Britannica article on Diwali with historical background and significance.
- "[Holi Festival in India]"(https://www.britannica.com/topic/Holi) - Britannica article on Holi with traditions and explanations.
- "[Eid al-Fitr Celebration in India]"(https://www.bbc.co.uk/newsround/68761299) - BBC article on how Eid is celebrated in India.
- "[Free Online Vocabulary Games]"(https://www.vocabulary.com/lists/222394) - Vocabulary.com offers various engaging vocabulary games.
- "[Learning Games for Adults]"(https://learnenglish.britishcouncil.org/vocabulary/vocabulary-games) - The British Council offers vocabulary games targeted at adults.
- "[Cultural Exchange Activities]"(https://eca.state.gov/about-bureau/organizational-structure/office-citizen-exchanges) - Global Citizen provides ideas for cultural exchange activities.

Unit 2: Language and Communication

- "[Grammar Quizzes Online]"(https://grammarquiz.net/) - [invalid URL removed] offers grammar quizzes for various difficulty levels.
- "[Grammar Games]"(https://learnenglishkids.britishcouncil.org/fun-games) - The British Council offers interactive grammar games.
- "[Virtual Classroom Ideas]"(https://uwaterloo.ca/centre-for-teaching-excellence/catalogs/tip-sheets/asynchronous-online-discussions-tips-for-instructors) - Ideas for adapting activities to a virtual classroom setting if needed.
- "[Online Grammar Checkers]"(https://www.grammarly.com/desktop) - Tools like Grammarly can help students find grammar mistakes in their texts.
- "[Bingo Card Creator]"(https://myfreebingocards.com/e/xvip3) - Create customized bingo cards with your vocabulary words.
- "[Short Play Ideas for Students]"(https://www.readwritethink.org/classroom-resources/lesson-plans) - Provides inspiration for creating short classroom plays.

Unit 3: Cultural Exploration

- "[Discussion Starters for Environmental Issues]"(https://www.forbes.com/sites/esri/2023/06/06/wwms---what-would-the-map-say--simple-we-can-save-ourselves/) - Forbes offers discussion prompts related to environmental issues.
- "[Video Recipes of Indian Dishes]"(https://m.youtube.com/c/EasyIndianRecipes) - YouTube offers a vast collection of Indian recipe tutorials.
- "[Websites with Indian Recipes]"(https://www.bbcgoodfood.com/recipes/collection/indian-recipes) - BBC Good Food offers a variety of Indian recipes with detailed instructions.
- "[Online Auction Simulation]" https://www.classtools.net/ - ClassTools provides an online auction simulation tool.
- "[Virtual Tours of Historical Landmarks in India]"(https://www.airpano.com/360photo/taj-mahal-india/) - Many Indian historical landmarks offer virtual tours.
- "[Documentaries about Indian History]"(https://www.pbs.org/thestoryofindia/) - PBS provides documentaries on various aspects of Indian history.

- "[Online Tutorials for Basic Indian Dance Steps]"(https://www.youtube.com/) - YouTube offers tutorials for learning basic steps of various Indian dance styles.
- "[Websites about Indian Music]"(https://www.britannica.com/art/Indian-music) - Britannica provides information on different genres of Indian music.

Unit 4: Indian Folklore and Traditions

- "[Audio Recordings of Mahabharata]"(https://www.audible.com/pd/Mahabharata-The-Greatest-Spiritual-Epic-of-All-Time-Audiobook/B013ELVZQY) - Audible offers audio recordings of the Mahabharata.
- "[Panchatantra Stories Online]"(https://www.tell-a-tale.com/10-short-panchatantra-stories-must-read-4-6-year-old-kids/) - Website with various Panchat

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I Year I Sem
24CSE0400 T: Indian Traditions and Language Skills-Theory

L2 T0 P0 C2

Course Objectives: This course will enable students to:

1. Improve English language skills through exploring Indian culture.
2. Enhance intercultural understanding through comparison with students' own cultures.
3. Develop critical thinking and communication skills by engaging with diverse aspects of Indian culture.

Course Outcomes (COs): Upon completion of this unit students will:

CO1: Understand complex literary works and analyze the core theme of environment, social ethics.
CO2: Understand and apply comprehension skills through the analysis of texts on diverse engineering topics.
CO3: Apply proficiency in vocabulary building techniques to enhance their language skills.
CO4: Apply basic grammar concepts for effective English sentence construction and analysis.

Articulation Matrix
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CO2	-	-	-	1	-	-	2	-	-	3	-	-	-	-	-	1
CO3	-	2	-	-	-	-	-	-	-	3	-	1	-	-	-	-
CO4	-	2	-	-	-	-	-	-	-	3	-	1	-	-	-	-

Unit 1: Reading, Writing and Interpretation Skills **10 Hours**

- Where The Mind is Without Fear by Rabindranath Tagore **(Keyword: Patriotism)**
- National Education by M. K. Gandhi **(Keyword: Edification)**
- The Axe by R.K Narayan **(Keyword: Environment)**
- The Wonder That Was India- A.L Basham (an excerpt) **(Keyword: Indiannes**
- Preface to the Mahabharata C. Rajagopalachari (Keyword: Indian Mythology)

Unit 2: Comprehension Skills **12 Hours**

- Technological Innovations and Sustainable Development
- Artificial Intelligence in Modern Industry
- The Evolution of Renewable Energy Sources
- Cybersecurity in the Digital Age
- Innovations in Biomedical Engineering
- Climate Change and Its Impact on Engineering Practices

Unit 3: Basic Language Skills: Vocabulary Building **04 Hours**

Suffix, Prefix, Synonyms, Antonyms, Homophones, Homographs/Homonyms and One-word substitution.

Unit 4: Basic Language Skills: Basic Grammar **04 Hours**

Noun, Pronoun, Adjective, Verb, Adverb, Prepositions, Articles, Time and Tense.

Total: 30 Hours

Reference(s)

1. "Understanding Indian Culture & Values" by D.R. Saini
2. "Indian Cultural Heritage" by N.K. Singh
3. "Introduction to Indian Culture" by Bipin Chandra Pal
4. "Indian Culture, Art and Heritage" by Nitin Singhania
5. "Indian Culture: An Introduction" by K.M. Pannikar
6. “English Grammar in Use” by Raymond Myrphy
7. “Vocabulary in Use” by Michael McCarthy and Felicity O’Dell

List of e-Learning Resource

Unit 1: Introduction to Indian Culture

- "[Rabindranath Tagore's Where The Mind is Without Fear Poem Analysis]"(https://poemanalysis.com/rabindranath-tagore/where-the-mind-is-without-fear/) - Analysis of the poem for deeper understanding.
- "[Rabindranath Tagore Biography]"(https://www.poetryfoundation.org/poets/rabindranath-tagore) - Learn more about the author and his cultural context.
- "[Diwali: The Festival of Lights]"(https://www.britannica.com/question/How-is-Diwali-celebrated) - Britannica article on Diwali with historical background and significance.
- "[Holi Festival in India]"(https://www.britannica.com/topic/Holi) - Britannica article on Holi with traditions and explanations.
- "[Eid al-Fitr Celebration in India]"(https://www.bbc.co.uk/newsround/68761299) - BBC article on how Eid is celebrated in India.
- "[Free Online Vocabulary Games]"(https://www.vocabulary.com/lists/222394) - Vocabulary.com offers various engaging vocabulary games.
- "[Learning Games for Adults]"(https://learnenglish.britishcouncil.org/vocabulary/vocabulary-games) - The British Council offers vocabulary games targeted at adults.
- "[Cultural Exchange Activities]"(https://eca.state.gov/about-bureau/organizational-structure/office-citizen-exchanges) - Global Citizen provides ideas for cultural exchange activities.

Unit 2: Language and Communication

- "[Grammar Quizzes Online]"(https://grammarquiz.net/) - [invalid URL removed] offers grammar quizzes for various difficulty levels.
- "[Grammar Games]"(https://learnenglishkids.britishcouncil.org/fun-games) - The British Council offers interactive grammar games.
- "[Virtual Classroom Ideas]"(https://uwaterloo.ca/centre-for-teaching-excellence/catalogs/tip-sheets/asynchronous-online-discussions-tips-for-instructors) - Ideas for adapting activities to a virtual classroom setting if needed.
- "[Online Grammar Checkers]"(https://www.grammarly.com/desktop) - Tools like Grammarly can help students find grammar mistakes in their texts.
- "[Bingo Card Creator]"(https://myfreebingocards.com/e/xvip3) - Create customized bingo cards with your vocabulary words.
- "[Short Play Ideas for Students]"(https://www.readwritethink.org/classroom-resources/lesson-plans) - Provides inspiration for creating short classroom plays.

Unit 3: Cultural Exploration

- "[Discussion Starters for Environmental Issues]"(https://www.forbes.com/sites/esri/2023/06/06/wwms---what-would-the-map-say--simple-we-can-save-ourselves/) - Forbes offers discussion prompts related to environmental issues.
- "[Video Recipes of Indian Dishes]"(https://m.youtube.com/c/EasyIndianRecipes) - YouTube offers a vast collection of Indian recipe tutorials.
- "[Websites with Indian Recipes]"(https://www.bbcgoodfood.com/recipes/collection/indian-recipes) - BBC Good Food offers a variety of Indian recipes with detailed instructions.
- "[Online Auction Simulation]" https://www.classtools.net/ - ClassTools provides an online auction simulation tool.
- "[Virtual Tours of Historical Landmarks in India]"(https://www.airpano.com/360photo/taj-mahal-india/) - Many Indian historical landmarks offer virtual tours.
- "[Documentaries about Indian History]"(https://www.pbs.org/thestoryofindia/) - PBS provides documentaries on various aspects of Indian history.
- "[Online Tutorials for Basic Indian Dance Steps]"(https://www.youtube.com/) - YouTube offers tutorials for learning basic steps of various Indian dance styles.
- "[Websites about Indian Music]"(https://www.britannica.com/art/Indian-music) - Britannica provides information on different genres of Indian music.

Unit 4: Indian Folklore and Traditions

- "[Audio Recordings of Mahabharata]"(https://www.audible.com/pd/Mahabharata-The-Greatest-Spiritual-Epic-of-All-Time-Audiobook/B013ELVZQY) - Audible offers audio recordings of the Mahabharata.
- "[Panchatantra Stories Online]"(https://www.tell-a-tale.com/10-short-panchatantra-stories-must-read-4-6-year-old-kids/) - Website with various Panchat

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Bachelor of Technology (Computer Science and Engineering/AI)

Semester-I

L-2 T-1 P-0 C-3

24CSE0500 T: Computer Fundamentals

Course Objectives.

- To understand students with the core concepts of computer science with introduction of emerging trends in the domain of computer science.
- Students will understand the foundations of computers, its working and major components

Course Outcomes (COs) upon completion of this course student will be able to

1. Understand core computer components and their interconnection.
2. Understand various categories of software and execute various commands under operating system to perform regular routines.
3. Analyze how computer programs execute using language processors and design database using SQL to perform various operations on the database.
4. Apply computer networking fundamentals in developing a small network of computers.
5. Understand use cases for emerging technologies.

Articulation Matrix

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	-	-	-	-	-	-	-	-	-	1	-	1	-
CO2	1	3	-	-	-	-	-	-	-	-	-	1	-	1	-
CO3	1	3	-	-	-	-	-	-	-	-	-	1	-	1	-
CO4	1	2	2	-	3	-	-	-	1	1	-	1	2	-	1
CO5	1	2	2	-	3	-	-	-	1	1	-	1	2	1	1

UNIT I: Introduction to Computers **9 Hours**

Basic concepts of computer organization: Input and Output, Arithmetic and logic units, Processor, Registers, Memory; Input and output devices; Historical perspective of computers: Evolution of computers; Memory hierarchy: Primary and secondary memory and their types; Types of memory based on the basic principles of operation: Sequential access, Direct access.

UNIT II:Types of Software and Operating System Fundamentals **9 Hours**

Software and its types: System software, Application software, Firmware, Middleware; Free vs. proprietary software; Open source software: FOSS; Booting process: POST and BIOS; Operating system: Introduction, Need, Services and Functions; Types: Batch processing, Multiprogramming, Multitasking; Case study of various operating systems such as MS DOS, Windows and any of the Linux distribution.

UNIT III: Language Processors and Databases **9 Hours**

Language processors: Compilers, Assembler, Interpreter; Types of programming languages: Low level, high level, assembly language; Programming paradigms: Imperative, Structured, Object oriented, Declarative, Functional, Logic and Constraint programming; Databases: Database management systems (DBMS), File system vs. database management systems; Advantages of DBMS; Concepts of key and constraints; Data models: Conceptual, Representational, Physical data models and their types.

UNIT IV: Introduction to Computer Networking **9 Hours**

Computer networking fundamentals; Types of networks: LAN, MAN, WAN; Patterns of interconnection; Internet; World wide web; Basic networking elements: Hub, Switch, Repeaters, Routers, Bridge; Transmission media: Twisted pair cable, Coaxial cable, Optical fiber cable; Client server architecture; Basic concepts of MAC and IP address; Protocols; ISO-OSI model: Functions of different layers; Virus, Worm, Malware, Trojan, Spyware and their types.

UNIT V: Emerging Technologies in Computer Science **9 Hours**

Overview of emerging technologies and their applications: Artificial intelligence, Machine learning, Cloud computing, Internet of Things and Blockchain technology.

Total: 45 Hours

Reference(s)

1. Balagurusamy E. (2009). Fundamentals of Computers. McGraw-Hill Technology Education, Boston.
2. Norton P. (2017). Introduction to Computers. 7th edition. McGraw-Hill Technology Education, Boston.
3. Nisan N. and Schocken S. (2005). The Elements of Computing Systems: Building a Modern Computer from First Principles, The MIT Press, Cambridge.
4. Kumar P., Tomar A. and Sharmila R. (2022). Emerging Technologies in Computing: Theory, Practice and Advances. 1st edition. CRC Press.
5. Silberschatz A., Korth H. F. and Sudarshan S. (2011). Database System Concepts. 6th edition. McGraw Hill.

List of e-Learning Resources:

1. https://nptel.ac.in
   https://learn.microsoft.com/

Subject Tr. **Academic Coordinator** **HoD** **Sr. Faculty Nominated by DOAA**

Bachelor of Technology (Computer Science and Engineering/AI)
Semester-I

L-0 T-0 P-2 C-1

24CSE0500P: Computer Fundamentals

Course Objectives.

- To understand students with the core concepts of computer science with introduction of emerging trends in the domain of computer science.
- Students will understand the foundations of computers, its working and major components

Course Outcomes (COs) upon completion of this course student will be able to

1. Understand core computer components and their interconnection.
2. Understand various categories of software and execute various commands under operating system to perform regular routines.
3. Analyze how computer programs execute using language processors and design database using SQL to perform various operations on the database.
4. Apply computer networking fundamentals in developing a small network of computers.
5. Understand use cases for emerging technologies.

Articulation Matrix

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	-	-	-	-	-	-	-	-	-	1	-	1	-
CO2	1	3	-	-	-	-	-	-	-	-	-	1	-	1	-
CO3	1	3	-	-	-	-	-	-	-	-	-	1	-	1	-
CO4	1	2	2	-	3	-	-	-	1	1	-	1	2	-	1
CO5	1	2	2	-	3	-	-	-	1	1	-	1	2	1	1

Practical's

1. Explore fundamental components of computer hardware.
2. Identify key system software components like device manager and BIOS.
3. Execute basic MS DOS commands to perform specific tasks using commands dir,cd,cmd,chkdsk,mkdir,copy con etc.
4. Demonstatrate the process of hard drive partitioning using disk management tools under Windows and MS DOS.
5. Execute the function of basic Linux commands like Navigation Commands, File Management Commands.
6. Utilize Vi editor for text editing in Linux environment.
7. Interpret the structure and purpose of SQL language and Decompose SQL queries into their constituent parts.
8. Implement DDL commands to create and manipulate database structures with DDL statement to create ,alter,drop a table ,named "Employees" with the following columns: EmployeeID (integer, primary key),Name (varchar(50)),Department (varchar(30)),Salary (decimal(10,2)).
9. Implement DML commands to manipulate data within the "Employees" table created using DDL:Insert: Add three new employees to the "Employees" table with the following data:EmployeeID: 101, Name: John Doe, Department: Sales, Salary: 50000,EmployeeID: 102, Name: Jane Smith, Department: Marketing, Salary: 60000,EmployeeID: 103, Name: Michael Johnson, Department: IT, Salary: 70000, Increase the salary of all employees in the "Sales" department by 10%.,Delete: Remove the employee with EmployeeID 102 from the "Employees" table.
10. Implement DCL commands to create and manipulate database structures. You have a database with a table named "Orders" containing information about customer orders.Grant the 'SELECT' privilege on the 'Orders' table to a user named 'sales_analyst'.Revoke the 'INSERT' and 'UPDATE' privileges on the 'Orders' table from the user 'sales_analyst'.Grant the 'DELETE' privilege on the 'Orders' table to a user named 'admin'.

11. Apply primary and foreign key constraints to database relations and Identify relationships between tables using primary and foreign keys.
12. Design a mini database project incorporating SQL concepts.
13. Create network cables using crimping tools and Prepare and test crossover cable using crimping tool.
14. Create network cables using crimping tools and Prepare and test straight through cable using crimping tool.
15. Assess the effectiveness of different network configurations.
16. Configure peer to peer network of at least two nodes.
17. Develop solutions to real-world problems using machine learning.
18. Case Study: Solutions to real-world problems cloud computing.
19. Case Study: Solutions to real-world problems internet of things.
20. Critique the application of blockchain in various use cases.

Total: 30 Hours.

Reference(s)

1. Balagurusamy E. (2009). Fundamentals of Computers. McGraw-Hill Technology Education, Boston.
2. Norton P. (2017). Introduction to Computers. 7th edition. McGraw-Hill Technology Education, Boston.
3. Nisan N. and Schocken S. (2005). The Elements of Computing Systems: Building a Modern Computer from First Principles, The MIT Press, Cambridge.
4. Kumar P., Tomar A. and Sharmila R. (2022). Emerging Technologies in Computing: Theory, Practice and Advances. 1st edition. CRC Press.
5. Silberschatz A., Korth H. F. and Sudarshan S. (2011). Database System Concepts. 6th edition. McGraw Hill.

List of e-Learning Resources:

1. https://nptel.ac.in/
2. https://learn.microsoft.com/

Subject Tr. **Academic Coordinator** **HoD** **Sr. Faculty Nominated by DOAA**

Mandsaur University

Bachelor of Technology (Computer Science and Engineering)

Semester-I

L-0 T-0 P-4 C-2

24CSE0600 P: Web Development-I

Course Objectives

- To familiarize students with the fundamentals of web development
- To utilize basic web technologies in designing static web pages
- To develop interactive web pages using JavaScript technology
- To familiarize students with the steps to host the website and perform basic search engine optimization

Course Outcomes (COs)

1. Understand the evolution of web and the fundamentals of web applications and their working
2. ApplyHTML to create static web pages
3. Apply CSS to HTML pages to enhance the appearance and layout
4. Create web pages using JavaScript to develop interactive web pages
5. Understand web hosting and apply basic search engine optimization to web pages

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	-	-	-	-	-	-	-	1	-	1	1	2	-
CO2	1	1	2	-	3	-	-	-	1	1	-	1	2	-	1
CO3	1	1	3	-	2	-	-	-	1	1	-	1	2	-	2
CO4	1	2	2	-	3	-	-	-	1	1	-	1	2	-	2
CO5	1	3	1	1	2	-	-	-	-	1	-	1	1	1	1

UNIT I: Introduction to World Wide Web (WWW) **12 Hours**

History of Internet: Client server architecture, Basic internetworking devices, Internet addresses; World Wide Web (WWW): Components; Structure of the Web, Web Pages and their types, HTTP, HTTP Client and HTTP server; Web applications and their architecture; Web page vs. web applications; Hypertext; URLs, Domain name system;Web browser and web servers; Common gateway interface (CGI).

UNIT II: Hyper Text Markup Language (HTML) **12 Hours**

Introduction to HTML: HTML and its versions; document structure, Tags and elements; Attributes and properties; HeadingsText and Paragraphs; Styles; Hyperlinks;Images; Tables;Forms; Video and audio: autoplay, loop, preload, play, pause, media volume, forward, reverse.

UNIT III: Cascading Style Sheets (CSS) **12 Hours**

Introduction to CSS: Cascade: Importance, Specificity and Source order;Rules, Syntax; Selectorsand selector combinations; Comment; Colors; Background; Borders; Properties: Color, Length and Property list;The Box model; Outline; Text; Fonts; Icons; Lists; Tables; Tooltip; Animation; Images; Video; Grid container; Methods of linking CSS to HTML: External, Internal and Inline.

UNIT IV: JavaScript **12Hours**

Introduction: Client side Vs. server side, Implementations: Browser Object Model (BOM) and Document Object Model (DOM), Data types: Primitive and Reference, Variables; Functions and Methods; Scoping in JavaScript; Operators; Control statements: if, iterative, labeled, break and continue, with and switch;JavaScript HTML DOM: Methods, Properties; HTML DOM Document Object; HTML DOM Elements; DOM HTML; JavaScript Forms: Validation, Automatic validation, HTML constraint validation.

UNIT V: Introduction to Web Hosting and Search Engine Optimization **12 Hours**

Introduction to web hosting and its types; Requirements, Elements needed for web hosting; Web hosting services; Criteria to select a hosting service; Hosting a website;Search engines and Directories; Crawling and Indexing; Working of search engines; Search engine optimization (SEO): Need, Process; Basic site

optimizationtechniques: On Page SEO, Off Page SEO; Web Analytics.

Practical(s)

1. Case study on various web browsers and web servers.
2. Create a webpage with HTML describing your department. Use paragraph and list tags.
3. Create links on the words e.g. “Computer Science and Engineering” and “Mandsaur University” to link them to the Institute website.
4. Insert an image and create a link such that clicking on image takes user to other page.
5. Change the background color of the page and at the bottom create a link to take user to the top of the page.
6. Create a table to list various web browsers and web servers with their icons.
7. Use tables to provide layout to your HTML page describing the features of web browsers and web server listed in Exp. 6.
8. Use and tags to provide a layout to the above page instead of a table layout.
9. Use frames inside a web page and divide it into 3 frames 30% on left to show index of various pages, 70% in center to show body of page.
10. Design a web page to embed audio and video using HTML.
11. Use in-line CSS to change colors of certain text portion, bold, underline and italics certain words in your HTML web page. Also change background color of each paragraph using in-line CSS.
12. Write all the above styling in CSS in different file (.css) and link it to your webpage such that changes made in CSS file are immediately reflected on the page.
13. Group paragraphs into single class and add styling information to the class in CSS.
14. Create a simple form to register for a 5 days workshop on Advances in Web Development. Include text boxes, radio buttons and other controls to take input from user including Submit and Cancel buttons.
15. Create a login page for accessing the course contents of the class. Use password field and place a Submit and Reset buttons.
16. Write a JavaScript program to display information box as soon as page loads.
17. Write a JavaScript program to change background color after 10 seconds of page load.
18. Write a JavaScript program to dynamically bold, italic and underline words and phrases based on cursor actions.
19. Write JavaScript code to check whether given number is prime or not?
20. Create a form similar to the one in Exp. 15. Put validation checks on values entered by the user using JavaScript (such as age should be a value between 1 and 150).

Total: 60 Hours

Reference(s)

1. Jackson J. C. (2009). Web Technologies: A Computer Scince Perspective. Prentice Hall.
2. Godbole A. and Kahate A (2017). Web Technologies: TCP/IP, Web/Java Programming and Cloud Computing. 3rd edition. Mc Graw Hill Education.
3. Powell T. and Schneider F. (2012). Java Script: The Complete Reference. 3rd edition. McGraw Hill Education.
4. Powell T. (2010). HTML & CSS: The Complete reference. 5th edition. McGraw Hill Education.
5. Web Technologies: HTML, JavaScript, PHP, Java, JSP, ASP.net, XML and AJAX Black Book. Kogent Learning Solutions Inc., Dreamtech Press.
6. Pollock P. (2013). Web Hosting for Dummies. Wiley Publishing Inc.
7. Ledford J. (2008). SEO: Search Engine Optimization Bible. Wiley Publishing Inc.

List of e-Learning Resources:

1. https://nptel.ac.in/
2. https://www.coursera.org/

Subject Tr. **Academic Coordinator** **HoD** **Sr. Faculty Nominated by DOAA**