Resolutions of the
1st BOS Meeting of the CSE-AI&ML
2025-26

Date:24.02.2026
Time:3:00 PM
Mode: Hybrid Mode

Resolutions of the 1st BOS Meeting of the CSE-AI&ML of
Eswar College of Engineering (Autonomous), Kesanupalli held on 24.02.2026
(Through Hybrid Mode)

Members Present

S.No	Name of the Member	Designation / Occupation	Category
1	Dr. P. Vasanthi	Head of the Department	Chairperson
2	Mr. G. Sarath Kumar	Assistant Professor	One Faculty from each specialization from the College
3	Mr. CH Kishore	Assistant Professor	One Faculty from each specialization from the College
4	Dr. N. Sandhya	Professor & RDC - Head, Department of CSE - AIML, IoT, R&AI, VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad, Mail: sandhya_n@vnrvjiet.in, Mobile: 9849354789	Subject experts outside parent university
5	Prof. K. P. Supreethi	Professor, Dept. of CSE, JNTUH, Mail: supreethi.pujar@jntuh.ac.in, Contact: 9949738588	Subject experts outside parent university
6	Dr. G. Madhavi	Associate Professor, Dept. of CSE, UCEN, JNTUK, Narasaraopet	University Nominee
7	Rajesh Kumar Nakka	Principal Solution Architect, Company: Tech Mahindra, SDB3, ELCOT SEZ Sholinganallur	Industry
8	Dr. J. Yedukondalu	Associate Professor, PACE Institute of Technology and Science, Ongole	Alumni

ESWAR
COLLEGE OF ENGINEERING
(AN UGC AUTONOMOUS INSTITUTION)

COUNSELLING CODE ESWR
Approved by AICTE New Delhi, Affiliated to JNTUK Kakinada & SBTE&T, AP
Accredited by NAAC with " B++" Grade
Kesanupalli (V), Narasaraopet(M), Palnadu (Dt), A.P - 522 601

DEPARTMENT OF AI&ML OF BOS

AGENDA – FIRST BOARD OF STUDIES MEETING

Agenda Items (2026/AI&ML/BOS–1)

1.1 Welcome of the Members and Invitees of the Board of Studies Meeting

Formal welcome to all internal members, external subject experts, industry representatives, university nominees, and invitees.

1.2 Address by the Chairman of the Board of Studies AI&ML

Opening remarks highlighting academic vision, emerging AI trends, and industry expectations.

1.3 Presentation of the Programme Structure (Semester-wise) for AI&ML

Discussion and approval of I B.Tech curriculum structure.

1.4 Presentation of Syllabus for AI&ML Courses

Discussion and finalization of detailed syllabi of Core Courses, Labs.

1.5 Ratification of Academic Regulations, Credit Structure, and CBCS Pattern

Credit distribution, L–T–P structure.

1.6 Any Other Item with the Permission of the Chair

1.7 Vote of Thanks

Members Absent: Nil

The quorum being present, the Chairperson called the meeting to order.

MINUTES OF THE FIRST BOARD OF STUDIES MEETING

Department of Artificial Intelligence & Machine Learning (AI&ML)
Agenda Items: 2026/AI&ML/BOS–1

The First Board of Studies meeting of the Department of Artificial Intelligence & Machine Learning was conducted as per the scheduled agenda. The Chairperson welcomed all internal members, external academicians, industry experts, university nominees, and invitees. The following agenda items were discussed and the resolutions were recorded.

Item No. 1.1 – Welcome of the Members and Invitees

The Chairperson extended a warm welcome to all the members of the Board of Studies and highlighted the importance of collaborative academic planning.

Resolution:
The Board noted the welcome note and commencement of the First Board of Studies Meeting.

Item No. 1.2 – Address by the Chairperson of the Board of Studies

The Chairperson addressed the members regarding the academic vision of the AI&ML program, emerging AI technologies, industry requirements, and the need for outcome-based education.

Resolution:
The Board noted the Chairperson's address and acknowledged the academic directions proposed for strengthening the AI&ML program.

Item No. 1.3 – Presentation of Programme Structure (Semester-wise) for AI&ML

The semester-wise programme structure for I B.Tech AI&ML was presented, including course distribution, credits, and curriculum design aligned with current industry trends.

Resolution:
After detailed discussion, the Board ratified the draft programme structure for implementation from the forthcoming academic batch.

Item No. 1.4 – Presentation of Syllabus for AI&ML Courses

The detailed syllabi of core theory courses and laboratory courses were presented and discussed. Suggestions were provided by external experts to enhance practical exposure and research orientation.

Resolution:
The Board ratified the finalized syllabus for AI&ML core courses and laboratories with suggested modifications.

Item No. 1.5 – Ratification of Academic Regulations, and Credit Structure

The academic regulations, credit distribution, L–T–P structurewere discussed in detail.

Resolution:
The Board ratified the Academic Regulations, and Credit Structure for the AI&ML programme.

Item No. 1.6 – Any Other Item with the Permission of the Chair

The Board discussed several valuable suggestions proposed by the honourable members under this agenda item.

The department (CSE-AI&ML) presented the proposal stating that the present I B.Tech course structure, syllabus, and credit system are designed in line with the JNTUK framework, ensuring academic uniformity and smooth implementation during the current academic phase.

Dr. G. Madhavi, Associate Professor, Department of CSE, UCEN, JNTUK, Narasaraopet, University Nominee, also noted that the department is currently implementing the JNTUK syllabus and advised maintaining the same until revised academic regulations are introduced.

Dr. N. Sandhya, Professor & RDC – Head, Department of CSE–AIML, IoT, R&AI, VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad, Subject Expert outside the parent university, observed that the department is presently following the JNTUK syllabus and advised to continue the same until further academic revisions are implemented.

Prof. K. P. Supreethi, Professor, Department of CSE, JNTUH, Subject Expert outside the parent university, observed that the department is presently following the JNTUK syllabus and suggested continuing the same until further academic revisions are implemented.

Mr. Rajesh Kumar Nakka, Industrial Expert from Tech Mahindra, suggested introducing Professional Grooming & Etiquette Module, establishing a LinkedIn Learning Circle, and implementing a Structured English Communication Lab to enhance students' industry readiness and professional skills.

After detailed deliberations, the Board ratified the suggestions of the members and resolved to consider the implementation of the proposed activities in a phased manner, while continuing with the existing JNTUK syllabus as recommended.

Vote of thanks
The meeting has concluded with a vote of thanks proposed by Dr. P. Vasanthi, expressing sincere gratitude to all the members for their valuable guidance and participation.
The meeting ended at 4 :00 PM with the consent of the Chair.

S.No	Name of the Member	Designation / Occupation	Category	Signature
1	Dr. P. Vasanthi	Head of the Department	Chairman	
2	Mr. G. Sarath Kumar	Assistant Professor	One Faculty from each specialization from the College	G. Sarath Kumar
3	Mr. CH Kishore	Assistant Professor	One Faculty from each specialization from the College	
4	Dr. N. Sandhya	Professor & RDC - Head, Department of CSE - AIML, IoT, R&AI, VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad, Mail: sandhya_n@vnrvjiet.in, Mobile: 9849354789	Subject experts outside parent university	Approved through mail
5	Prof. K. P. Supreethi	Professor, Dept. of CSE, JNTUH, Mail: supreethi.pujar@jntuh.ac.in , Contact: 9949738588	Subject experts outside parent university	Approved through mail
6	Dr. G. Madhavi	Associate. Professor, Dept. of CSE, UCEN, JNTUK, Narasaraopet	University Nominee	26/2/2026
7	Rajesh Kumar Nakka	Principal Solution Architect, Company: Tech Mahindra, SDB3, ELCOT SEZ Sholinganallur	Industry	Approved through mail
8	Dr. J. Yedukondalu	Associate Professor, PACE Institute of Technology and Science, Ongole	Alumni	Approved through mail

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Re: Request for Approval of BoS Minutes of Meeting – CSE-AI&ML Department

From Sagdhya N <sandhya_n@vnrvjiet.in> Feb 26, 9:47 AM

to me, yedukondalu463@gmail.com, supreethi.pujari@jntuh.ac.in, madhavi.researchinfo@gmail.com, rajeshjanaka@gmail.com, sarathkumarg51l@gmail.com, Kishorech15@gmail.com

Approved.

On Thu, Feb 26, 2026 at 9:43 AM Yedukondalu J <yedukondalu463@gmail.com> wrote:

> Please consider this as formal approval confirmation.
>
> Google scholar link: https://scholar.google.com/citations?user=pf0adjoAAAAJ&hl=en&oi=ao
>
> Thanks & Regards
> Dr. J YEDUKONDALU
> Assoc. Professor, ECE
> PACE Institute of Technology and Sciences
>
> On Wed, 25 Feb, 2026, 3:47 pm , <hoddet@eswarcollegeofengg.org> wrote:
>
> > Dear Sir/Madam,
> >
> > Greetings from the Department of CSE-AI&ML,

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Re: Request for Approval of BoS Minutes of Meeting – CSE-AI&ML Department

From Dr. K.P. Supreethi <supreethi.pujari@jntuh.ac.in> Feb 25, 5:35 PM

to me

I approve the minutes.

On Wed, 25 Feb, 2026, 3:47 pm , <hoddet@eswarcollegeofengg.org> wrote:

> Dear Sir/Madam,
>
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> Thank you for your valuable participation and insightful suggestions during the recent Board of Studies (BoS) meeting. The **Minutes of Meeting** have been prepared incorporating all the discussions, observations, and recommendations made by the honourable members.
>
> Kindly find the attached BoS Minutes of Meeting document for your review. We request you to please go through the document and share your approval and positive confirmation at your earliest convenience. Your approval will help us proceed with the academic formalities and further implementation.
>
> Thank you once again for your continuous support and guidance.
>
> Warm Regards,
> Dr. P. Vasanthi
> Head of the Department CSE– AI & ML

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Re: Request for Approval of BoS Minutes of Meeting – CSE-AI&ML Department

From Rajesh Nakka <rajeshjanaka@gmail.com> Feb 26, 8:46 AM

to me, sandhya_n@vnrvjiet.in, supreethi.pujari@jntuh.ac.in, madhavi.researchinfo@gmail.com, yedukondalu463@gmail.com, sarathkumarg511@gmail.com, Kishorech15@gmail.com

Hi All,

Please consider this as formal approval confirmation.

Regards,
Rajesh.

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Please consider this as formal approval confirmation.

Google scholar link: https://scholar.google.com/citations?user=pf0adjoAAAAJ&hl=en&oi=ao

Thanks & Regards
Dr. J YEDUKONDALU
Assoc. Professor, ECE
PACE Institute of Technology and Sciences

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B.Tech. – I Year I Semester (for Group-A Branches)

S.No.	Category	Title	L/D	T	P	Credits
1	BS&H	Communicative English	2	0	0	2
2	BS&H	Engineering Chemistry/ Chemistry/Fundamental Chemistry	3	0	0	3
3	BS&H	Linear Algebra & Calculus	3	0	0	3
4	Engineering Science	Basic Civil & Mechanical Engineering	3	0	0	3
5	Engineering Science	Introduction to Programming	3	0	0	3
6	BS&H	Communicative English Lab	0	0	2	1
7	BS&H	Engineering Chemistry/ Chemistry/Fundamental Chemistry Lab	0	0	2	1
8	Engineering Science	Engineering Workshop	0	0	3	1.5
9	Engineering Science	Computer Programming Lab	0	0	3	1.5
10	BS&H	Health and wellness, Yoga and Sports	-	-	1	0.5
		Total	**14**	**00**	**11**	**19.5**

B.Tech. – I Year I Semester (for Group-B Branches)

S.No.	Category	Title	L/D	T	P	Credits
1	BS&H	Engineering Physics	3	0	0	3
2	BS&H	Linear Algebra & Calculus	3	0	0	3
3	Engineering Science	Basic Electrical & Electronics Engineering	3	0	0	3
4	Engineering Science	Engineering Graphics	1	0	4	3
5	Engineering Science	Introduction to Programming	3	0	0	3
6	Engineering Science	IT Workshop	0	0	2	1
7	BS&H	Engineering Physics Lab	0	0	2	1
8	Engineering Science	Electrical & Electronics Engineering Workshop	0	0	3	1.5
9	Engineering Science	Computer Programming Lab	0	0	3	1.5
10	BS&H	NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5
		Total	**13**	**00**	**15**	**20.5**

B.Tech. – I Year II Semester (for Group-A Branches)

S.No.	Category	Title	L/D	T	P	Credits
1	BS&H	Engineering Physics	3	0	0	3
2	BS & H	Differential Equations & Vector Calculus	3	0	0	3
3	Engineering Science	Basic Electrical and Electronics Engineering	3	0	0	3
4	Engineering Science	Engineering Graphics	1	0	4	3
5	Engineering Science	IT Workshop	0	0	2	1
6	Professional Core	Data Structures / Electrical Circuit Analysis – I (Branch specific)	3	0	0	3
7	BS&H	Engineering Physics Lab	0	0	2	1
8	Engineering Science	Electrical and Electronics Engineering Workshop	0	0	3	1.5
9	Professional Core	Data Structures Lab / Electrical Circuits Lab	0	0	3	1.5
10		NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5
Total			13	00	15	20.5

B.Tech. – I Year II Semester (for Group-B Branches)

S.No.	Category	Title	L	T	P	Credits
1	BS&H	Communicative English	2	0	0	2
2	BS & H	Engineering Chemistry / Chemistry / Fundamental Chemistry	3	0	0	3
3	Engineering Science	Differential Equations & Vector Calculus	3	0	0	3
4	Engineering Science	Basic Civil & Mechanical Engineering	3	0	0	3
5	Professional Core	Engineering Mechanics/Network Analysis/ Data structures.(Branch specific)	3	0	0	3
6	BS&H	Communicative English Lab	0	0	2	1
7	BS&H	Engineering Chemistry / Chemistry / Fundamental Chemistry Lab	0	0	2	1
8	Engineering Science	Engineering Workshop	0	0	3	1.5
9	Professional Core	Engineering Mechanics & Building Practices Lab Engineering Mechanics Lab / Network Analysis and Simulation Lab / Data structures Lab	0	0	3	1.5
10		Health and wellness, Yoga and Sports	-	-	1	0.5
Total			14	00	11	19.5

IT WORKSHOP LAB

(Common to All Engineering Branches)

L	T	P	C
0	0	2	1

Course Objectives

The course aims to:

- Introduce internal components of a computer system, peripherals, input/output ports, and connecting interfaces.
- Demonstrate installation and configuration of operating systems using dual-boot environments such as Windows and Linux/BOSS.
- Provide hands-on practice with basic Linux command line operations.
- Enable effective use of the Internet for productivity, communication, and lifelong learning.
- Familiarize students with compression utilities, multimedia tools, antivirus software, and office applications such as word processors, spreadsheets, and presentation tools.

Course Outcomes

After successful completion of this course, students will be able to:

CO1: Perform basic hardware troubleshooting and maintenance.
CO2: Understand computer hardware architecture and interdependencies.
CO3: Protect computer systems from malware threats such as viruses and worms.
CO4: Create professional documents and presentations.
CO5: Perform data analysis and calculations using spreadsheet tools.

List of Experiments / Tasks

Module–1: PC Hardware and Software Installation

Task 1:
Identify computer peripherals, CPU components, and their functions. Draw and submit a block diagram showing system configuration.

Task 2:
Disassemble and reassemble a PC system to working condition. Demonstrate the process to the instructor and attend viva evaluation.

Task 3:
Install the Windows operating system individually on a computer system and verify installation.

Task 4:
Install Linux OS alongside Windows using dual-boot or virtual machine configuration (VMWare). Demonstrate functionality.

Task 5:
Install BOSS operating system with dual-boot configuration and verify system operation.

Module–2: Internet and World Wide Web

Task 1 – Orientation & Connectivity:
Configure LAN connectivity, TCP/IP settings, and demonstrate web browsing and email usage. If internet is unavailable, instructors may simulate a web environment over LAN.

Task 2 – Web Browsers & Surfing:
Customize browser settings including proxy configuration, bookmarks, search tools, pop-up blocking, and plugin installation.

Task 3 – Search Engines & Netiquette:
Understand search engine usage. Perform topic-based searches and present results to the instructor.

Task 4 – Cyber Hygiene:
Configure browser security settings, block malicious downloads, and apply safe internet practices.

Module–3: LaTeX and WORD Processing

Task 1 – Orientation:
Overview of LaTeX and MS Word (or equivalent FOSS tools), toolbars, file management, formatting tools, and help resources.

Task 2 – Project Certificate Creation:
Apply formatting features such as fonts, drop caps, text effects, spacing, borders, headers, footers, and date/time insertion.

Task 3 – Project Abstract Preparation:
Use styles, tables, numbering, hyperlinks, footnotes, spell check, symbols, and track changes.

Task 4 – Newsletter Design:
Create multi-column layouts, insert images and word art, format textboxes, paragraphs, and perform mail merge operations.

Module–4: EXCEL Spreadsheet Applications

Excel Orientation:
Introduction to spreadsheet concepts, toolbars, file management, and resources.

Task 1 – Scheduler Creation:
Use gridlines, formatting, autofill, and summation functions.

Task 2 – GPA Calculation:
Apply formulas such as average, standard deviation, COUNT, LOOKUP/VLOOKUP, chart creation, and worksheet management.

Task 3 – Advanced Operations:
Use freeze panes, sorting, grouping, logical operators, and conditional formatting.

Module–5: POWERPOINT Presentations

Task 1 – Basic Presentation Tools:
Slide layouts, formatting text, bullets, shapes, and visual elements.

Task 2 – Interactive Presentations:
Insert multimedia elements including images, audio, video, tables, charts, and hyperlinks.

Task 3 – Master Slides & Design:
Use slide masters, templates, backgrounds, textures, hidden slides, and multiple view modes.

Module–6: AI Tools – ChatGPT Applications

Task 1 – Prompt Engineering:
Experiment with different prompts to observe model responses.
Example: *"What is the capital of France?"*

Task 2 – Creative Writing Assistance:
Generate story content or ideas using AI prompts.
Example: *"Describe a world where gravity stopped working."*

Task 3 – Language Translation:
Translate text between languages and evaluate fluency and accuracy.
Example: *"Translate 'Hello, how are you?' into French."*

Reference Books

1. Vikas Gupta, *Comdex Information Technology Course Toolkit*, Wiley Dreamtech, 2003.
2. Cheryl A. Schmidt, *Complete Computer Upgrade and Repair Book*, Wiley Dreamtech, 3rd Edition, 2013.
3. ITL Education Solutions, *Introduction to Information Technology*, Pearson Education, 2nd Edition, 2012.
4. Kate J. Chase, *PC Hardware – A Handbook*, PHI (Microsoft).

5. Leslie Lamport, *LaTeX Companion*, PHI/Pearson.

6. David Anfinson & Ken Quamme, *IT Essentials PC Hardware and Software Companion Guide*, Cisco Press, Pearson Education.

7. Patrick Regan, *IT Essentials PC Hardware and Software Labs and Study Guide*, Cisco Press, Pearson Education.

INTRODUCTION TO PROGRAMMING

(Common to All Engineering Branches)

L	T	P	C
3	0	0	3

Course Objectives

The objective of this course is to:

- Introduce students to the fundamental concepts of computer programming and problem solving.
- Provide practical exposure to coding practices, program execution, and debugging techniques.
- Develop logical reasoning and algorithmic thinking skills through structured programming.
- Familiarize learners with essential programming constructs including data types, control structures, functions, arrays, and pointers.
- Encourage collaborative learning and teamwork through programming-based activities and problem-solving exercises.

Course Outcomes

Upon successful completion of the course, students will be able to:

CO1: Understand basic computer organization, algorithms, and principles of algorithmic thinking.
CO2: Analyze computational problems and design appropriate algorithms for their solutions.
CO3: Implement algorithms using the C programming language effectively.
CO4: Apply advanced programming concepts such as pointers, structures, and file handling.
CO5: Demonstrate problem-solving abilities by debugging, optimizing, and improving program efficiency.

Course Content

UNIT I – Introduction to Programming and Problem Solving

- Evolution and history of computers.
- Basic organization of a computer: ALU, memory, input/output units, and program counter.

- Overview of programming languages and structure of a computer program.
- Algorithms, flowcharts (using Dia Tool), and pseudocode representation.
- Compilation and execution process.
- Primitive data types, variables, constants, basic input/output operations.
- Operators, type conversion, and casting.
- Problem-solving techniques: algorithmic approach, characteristics of algorithms.
- Design strategies: Top-down and Bottom-up approaches.
- Introduction to time and space complexity.

UNIT II – Control Structures

- Sequential programming concepts.
- Decision-making statements: if, if-else, switch.
- Iterative constructs: for, while, do-while.
- Loop control statements: break and continue.

UNIT III – Arrays and Strings

- Array declaration, indexing, and memory representation.
- Programs using one-dimensional and two-dimensional arrays.
- Introduction to strings and string manipulation basics.

UNIT IV – Pointers and User-Defined Data Types

- Pointer fundamentals, address operators, and dereferencing.
- Pointer arithmetic and memory handling.
- Array manipulation using pointers.
- User-defined data types: Structures and Unions.

UNIT V – Functions and File Handling

- Function concepts: declaration, definition, parameters, and return types.
- Function calls and parameter passing mechanisms.
- Modifying parameters using pointers.
- Arrays as function parameters.
- Scope and lifetime of variables.
- Basics of file handling in C.

Note

The syllabus is designed using the **C programming language** as the primary implementation platform.

Textbooks

1. Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language*, Prentice Hall, 1988.
2. Byron S. Gottfried, *Schaum's Outline of Programming with C*, McGraw-Hill Education, 1996.

Reference Books

1. E. Balagurusamy, *Computing Fundamentals and C Programming*, McGraw-Hill Education, 2008.
2. Rema Theraja, *Programming in C*, Oxford University Press, 2nd Edition, 2016.
3. Behrouz A. Forouzan, Richard Gilberg, and Prasad, *C Programming: A Problem Solving Approach*, Cengage Learning, 3rd Edition.

COMPUTER PROGRAMMING LAB

(Common to All Engineering Branches)

L	T	P	C
0	0	3	1.5

Course Objectives

The objective of this laboratory course is to provide students with practical exposure to the C programming language and strengthen their problem-solving skills through hands-on programming exercises. The course focuses on developing logical thinking, understanding programming constructs, and building efficient solutions using structured programming techniques.

Course Outcomes

After successful completion of the course, students will be able to:

CO1: Read, understand, and trace the execution of C programs.
CO2: Select appropriate control structures to solve computational problems.
CO3: Utilize pointers and memory management concepts efficiently.
CO4: Develop, debug, and execute programs involving arrays, functions, and pointers.

List of Experiments / Weekly Schedule

UNIT I – Programming Fundamentals

Week 1 – Programming Environment

Objective:
Familiarize students with the programming environment and create basic programs.

Experiments:

- Introduction to Linux environment and editors such as Vi, Vim, and Emacs.
- Exposure to Turbo C and GCC compiler.
- Writing simple programs using printf() and scanf().

Week 2 – Algorithms and Flowcharts

Objective:
Understand problem-solving techniques using algorithms and graphical representations.

Experiments:

- Develop algorithms/flowcharts and convert them into C programs:
  - Sum and average of three numbers
  - Fahrenheit–Celsius conversion
  - Simple interest calculation

Week 3 – Variables and Expressions

Objective:
Learn variable declaration, data types, initialization, and arithmetic operations.

Experiments:

- Square root calculation
- Compound interest computation
- Area of triangle using Heron's formula
- Distance calculation problems

UNIT II – Control Structures

Week 4 – Operators and Expressions

Objective:
Understand operator precedence and associativity.

Experiments:

- Evaluate complex expressions
- Maximum of three numbers using conditional operator
- Calculate total and average marks

Week 5 – Decision Making

Objective:
Use conditional statements effectively.

Experiments:

- Maximum and minimum of four numbers
- Electricity bill calculation
- Roots of quadratic equation

- Calculator using switch case
- Leap year detection

Week 6 – Iterative Constructs

Objective:
Implement loops and structured jumps.

Experiments:

- Factorial calculation
- Prime number checking
- Sine and cosine series
- Palindrome number
- Pyramid pattern generation

UNIT III – Arrays and Strings

Week 7 – One-Dimensional Arrays

Objective:
Manipulate arrays and implement searching algorithms.

Experiments:

- Minimum and maximum of array
- Linear search
- Reverse an array
- Binary number complement
- Remove duplicate elements

Week 8 – Strings and Sorting

Objective:
Work with matrices, strings, and sorting techniques.

Experiments:

- Matrix addition and multiplication
- Bubble sort implementation
- String concatenation
- String reversal

UNIT IV – Pointers and Dynamic Memory

Week 9 – Dynamic Memory Allocation

Objective:
Understand pointers and dynamic memory operations.

Experiments:

- Sum of array using malloc()
- Student data processing using structures
- Memory allocation using calloc() and realloc()
- Command-line arguments

Week 10 – Structures and Linked Lists

Objective:
Explore structures, unions, and self-referential data structures.

Experiments:

- Date representation using bit fields
- Singly linked list implementation
- Structures vs. unions
- Bit manipulation using bitfields

UNIT V – Functions, Recursion, and File Handling

Week 11 – Functions

Objective:
Understand modular programming using functions.

Experiments:

- NCR calculation
- String length function
- Matrix transpose
- Numerical integration using Euler's method

Week 12 – Recursion

Objective:
Implement recursive programming techniques.

Experiments:

- Fibonacci series
- LCM calculation
- Factorial computation
- Ackermann function
- Sum of series

Week 13 – Call by Reference

Objective:
Understand pointer-based parameter passing.

Experiments:

- Swap numbers using call by reference
- Dangling pointer demonstration
- String copy using pointers
- Character analysis using pointers

Week 14 – File Handling

Objective:
Work with text and binary files.

Experiments:

- Read/write text files
- Binary file operations using fread() and fwrite()
- File copy and merge operations
- Count lines, words, and characters
- Display last *n* characters of a file

Textbooks

1. Ajay Mittal, *Programming in C: A Practical Approach*, Pearson.
2. Byron Gottfried, *Schaum's Outline of Programming with C*, McGraw Hill.

Reference Books

1. Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language*, Prentice Hall of India.
2. Forouzan, Gilberg, Prasad, *C Programming: A Problem-Solving Approach*, Cengage Learning.

DATA STRUCTURES

(Common to CSE, IT & Allied Branches)

L	T	P	C
3	0	0	3

Course Objectives

The objectives of this course are to:

- Provide a strong foundation in fundamental data structures and their implementations.
- Highlight the importance of data structures in designing efficient algorithms and programs.
- Develop problem-solving skills by selecting and applying appropriate data structures to real-world computational problems.

Course Outcomes

At the end of the course, students will be able to:

CO1: Explain the significance of linear data structures in efficient data organization and algorithm design.
CO2: Design and implement linked lists for dynamic memory management and data storage.
CO3: Develop programs using stacks to handle recursion, expression evaluation, and state management.
CO4: Apply queue-based algorithms for scheduling and breadth-first traversal, and differentiate between deques and priority queues for appropriate applications.
CO5: Formulate solutions to programming problems using stacks, queues, and trees.
CO6: Design hash-based solutions and identify scenarios where hashing improves performance.

Course Content

UNIT I – Introduction to Linear Data Structures

- Definition and significance of linear data structures.
- Abstract Data Types (ADTs) and implementation concepts.
- Basic time and space complexity analysis.
- Searching techniques: Linear Search and Binary Search.
- Sorting techniques: Bubble Sort, Selection Sort, and Insertion Sort.

UNIT II – Linked Lists

- Introduction to linked lists and dynamic memory allocation.
- Singly linked lists: representation and operations.
- Doubly linked lists and circular linked lists.
- Comparison between arrays and linked lists.
- Applications of linked lists in data management.

UNIT III – Stacks

- Concept and properties of stacks.
- Stack operations and implementation using arrays and linked lists.
- Applications of stacks: expression evaluation, backtracking, recursion handling, and list reversal.

UNIT IV – Queues and Deques

- Introduction to queues and their operations.
- Implementation of queues using arrays and linked lists.
- Applications in scheduling and breadth-first search.
- Double-ended queues (deques): operations, characteristics, and applications.

UNIT V – Trees and Hashing

- Introduction to trees and hierarchical data representation.
- Binary Search Trees (BST): insertion, deletion, and traversal techniques.
- Fundamentals of hashing and hash functions.
- Collision resolution methods: chaining and open addressing.
- Hash tables and applications such as caching and unique identifier generation.

Textbooks

1. Mark Allen Weiss, *Data Structures and Algorithm Analysis in C*, Pearson, 2nd Edition.
2. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, *Fundamentals of Data Structures in C*, Silicon Press, 2008.

Reference Books

1. Kurt Mehlhorn and Peter Sanders, *Algorithms and Data Structures: The Basic Toolbox*.

2. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, *C Data Structures and Algorithms*.
3. Brad Miller and David Ranum, *Problem Solving with Algorithms and Data Structures*.
4. Thomas H. Cormen et al., *Introduction to Algorithms*.
5. Robert Sedgewick, *Algorithms in C (Parts 1–5)*.

DATA STRUCTURES LAB

(Common to CSE, IT & Allied Branches)

L	T	P	C
0	0	3	1.5

Course Objectives

This laboratory course is designed to enhance students' ability to select and apply appropriate data structures for solving real-world computational problems. It provides hands-on experience in implementing fundamental data structures and understanding their practical applications in efficient algorithm design.

Course Outcomes

At the end of the course, students will be able to:

CO1: Explain the role of linear data structures in efficient data organization and algorithm execution.
CO2: Design and implement linked lists for dynamic memory allocation and data management.
CO3: Develop programs using stacks to manage program states, recursive operations, and expression evaluation.
CO4: Apply queue-based algorithms for scheduling and traversal problems, and distinguish between deques and priority queues for specific applications.
CO5: Identify suitable scenarios for hashing and develop hash-based solutions for efficient data retrieval.

List of Experiments

Exercise 1 – Array Manipulation

- Write a program to reverse an array.
- Implement searching techniques: Linear Search and Binary Search.
- Implement sorting techniques: Bubble Sort, Selection Sort, and Insertion Sort.

Exercise 2 – Linked List Implementation

- Implement a singly linked list with insertion and deletion operations.

- Reverse a linked list iteratively and recursively.
- Perform traversal and manipulation operations on linked lists.

Exercise 3 – Linked List Applications

- Detect and remove duplicate elements from a linked list.
- Represent polynomials using linked lists and perform addition.
- Implement a double-ended queue (deque) with standard operations.

Exercise 4 – Doubly and Circular Linked Lists

- Implement a doubly linked list and perform insertion, deletion, and traversal.
- Implement a circular linked list and demonstrate its operations.

Exercise 5 – Stack Operations

- Implement stacks using arrays and linked lists.
- Evaluate postfix expressions using a stack.
- Check balanced parentheses using stack operations.

Exercise 6 – Queue Operations

- Implement queues using arrays and linked lists.
- Simulate a printer queue system.
- Implement circular queues and perform related operations.

Exercise 7 – Stack and Queue Applications

- Convert infix expressions to postfix using stacks.
- Check whether a string is a palindrome.
- Use stacks or queues to test symmetry in data.

Exercise 8 – Binary Search Tree

- Implement Binary Search Tree (BST) using linked representation.
- Perform traversal operations on BST (Inorder, Preorder, Postorder).

Exercise 9 – Hashing

- Implement hash tables with collision resolution techniques.
- Design a simple caching mechanism using hashing.

Textbooks

1. Mark Allen Weiss, *Data Structures and Algorithm Analysis in C*, Pearson, 2nd Edition.
2. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, *Fundamentals of Data Structures in C*, Silicon Press, 2008.

Reference Books

1. Kurt Mehlhorn and Peter Sanders, *Algorithms and Data Structures: The Basic Toolbox*.
2. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, *C Data Structures and Algorithms*.
3. Brad Miller and David Ranum, *Problem·Solving with Algorithms and Data Structures*.
4. Thomas H. Cormen et al., *Introduction to Algorithms*.
5. Robert Sedgewick, *Algorithms in C (Parts 1–5)*.