



# SREENIVAS INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES

(AUTONOMOUS)

Department of Computer Science and Engineering

(Accredited by NBA)

## Minutes of Board of Studies Meeting held on 09<sup>th</sup> Feb 2026 at 02:30PM

The 10th Board of Studies Meeting of the Department of Computer Science and Engineering is held on 09.02.2026 through online mode (Google Meet) at 02:30 P.M.

### Members Present

| S.NO | FACULTY MEMBERS             | DESIGNATION                                                            | BOS MEMBERS                   |
|------|-----------------------------|------------------------------------------------------------------------|-------------------------------|
| 1.   | Dr. R Karunia Krishna Priya | Associate Professor & HOD,CSE, SITAMS                                  | Chairman                      |
| 2.   | Dr. Humera Khanam           | Professor of CSE , SVU University,Tirupathi.                           | JNTUA<br>Nominee<br>(Member)  |
| 3.   | Dr.Viswanath<br>Pulabaigari | Associate Professor, Dept. of CSE, IIIT,<br>Sricity, A .P              | Expert Member-I               |
| 4.   | Dr.N.Usha Rani              | Associate Professor, Dept.of CSE, SVUCE, S.V.<br>University, Tirupati. | Expert Member-II              |
| 5.   | Mr.K.Dhanamjayan            | Team lead, Accenture solutions Pvt. Ltd,<br>Bangalore.                 | Industrial Expert<br>(Member) |
| 6.   | Dr.Vikramneerugatti         | Associate Professor, Dept. of CSE , JAIN<br>University, Bangalore      | Alumni (Member)               |
| 7.   | Mr.A.Srinivasan             | Associate Professor & HOD/CSD, SITAMS                                  | Internal Member               |
| 8.   | Dr.T.Senthil                | Associate Professor, CSE,SITAMS                                        | Internal Member               |
| 9.   | Dr.D.Bright Anand           | Associate Professor, CSE,SITAMS                                        | Internal Member               |
| 10.  | Dr.K.Vijaya Bhaskar         | Associate Professor, CSE,SITAMS                                        | Internal Member               |
| 11.  | Mr.E.Purushotham            | Associate Professor, CSE, SITAMS                                       | Internal Member               |
| 12.  | Mr.N Vijaya Kumar           | Assistant Professor,CSE,SITAMS                                         | Internal Member               |
| 13.  | Mr.Pandreti Praveen         | Assistant Professor,CSE,SITAMS                                         | Internal Member               |
| 14.  | Mr.V P Manikandan           | Assistant Professor,CSE,SITAMS                                         | Internal Member               |
| 15.  | Ms.Sathiya Priya R          | Assistant Professor,CSE,SITAMS                                         | Internal Member               |
| 16.  | Mr K Bhaskar                | Assistant Professor,CSE,SITAMS                                         | Internal Member               |
| 17.  | Mrs.A.Ajitha                | Assistant Professor,CSE,SITAMS                                         | Internal Member               |
| 18.  | Mrs.A.Elavar kuzhali        | Assistant Professor,CSE,SITAMS                                         | Internal Member               |
| 19.  | Mrs.M.L.Madhuri             | Assistant Professor,CSE,SITAMS                                         | Internal Member               |

|     |                           |                                |                 |
|-----|---------------------------|--------------------------------|-----------------|
| 20. | Mrs.K.GeethaVani          | Assistant Professor,CSE,SITAMS | Internal Member |
| 21. | Mr.V.ShaikMohammad Shahil | Assistant Professor,CSE,SITAMS | Internal Member |

(Dr. R Karunia Krishna Priya)

CHAIRMAN BOS CSE

## LIST OF MEMEBERS ATTENDED THE BOS MEETING

| S.NO | FACULTY MEMBERS             | DESIGNATION                                                         | BOS MEMBERS                | SIGNATURE |
|------|-----------------------------|---------------------------------------------------------------------|----------------------------|-----------|
| 1.   | Dr. R Karunia Krishna Priya | Associate Professor & HOD,CSE, SITAMS                               | Chairman                   | ONLINE    |
| 2.   | Dr. Humera Khanam           | Professor of CSE , SVU University,Tirupathi.                        | JNTUA Nominee (Member)     | ONLINE    |
| 3.   | Dr.Viswanath Pulabaigari    | Associate Professor, Dept. of CSE, IIIT, Sricity, A .P              | Expert Member-I            | ONLINE    |
| 4.   | Dr.N.Usha Rani              | Associate Professor, Dept.of CSE, SVUCE, S.V. University, Tirupati. | Expert Member-II           | ONLINE    |
| 5.   | Mr.K.Dhanamjayan            | Team lead, Accenture solutions Pvt. Ltd, Bangalore.                 | Industrial Expert (Member) | ONLINE    |
| 6.   | Dr.Vikramneerugatti         | Associate Professor, Dept. of CSE , JAIN University, Bangalore      | Alumni (Member)            | ONLINE    |
| 7.   | Mr.A.Srinivasan             | Associate Professor & HOD/CSD, SITAMS                               | Internal Member            |           |
| 8.   | Dr.T.Senthil                | Associate Professor, CSE,SITAMS                                     | Internal Member            |           |
| 9.   | Dr.D.Bright Anand           | Associate Professor, CSE,SITAMS                                     | Internal Member            |           |
| 10.  | Dr.K.Vijaya Bhaskar         | Associate Professor, CSE,SITAMS                                     | Internal Member            |           |
| 11.  | Mr.E.Purushotham            | Associate Professor, CSE, SITAMS                                    | Internal Member            |           |
| 12.  | Mr.N Vijaya Kumar           | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 13.  | Mr.Pandreti Praveen         | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 14.  | Mr.V P Manikandan           | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 15.  | Ms.Sathiya Priya R          | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 16.  | Mr K Bhaskar                | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 17.  | Mrs.A.Ajitha                | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 18.  | Mrs.A.Elavar kuzhali        | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 19.  | Mrs.M.L.Madhuri             | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 20.  | Mrs.K.Geetha Vani           | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |
| 21.  | Mr.V.Shaik Mohammad Shahil  | Assistant Professor,CSE,SITAMS                                      | Internal Member            |           |

(Dr. R Karunia Krishna Priya)

CHAIRMAN BOS CSE

Chairman, BOS (CSE) welcomed all the members and introduced new members to the board.

**1.Action taken report on Minutes/Resolutions of 11<sup>th</sup> BOS Meeting**

As per the approval given in the BOS 11th meeting, R25 Regulation, Course Structure& Syllabi for I year I Semester M.Tech (CSE) was implemented successfully.

**2.Report on implementation of autonomy with respect to syllabi of R25-I Year**

The Chairman BOS presented a report on implementation of autonomy to the members. The board has congratulated the college authorities for successful implementation of SITAMS R25 regulations and syllabi for I year I Semester M.Tech (CSE).

**3.Academic Calendar for M.Tech Program for academic year 2025-26**

Resolved to adopt Academic Calendar for I M.Tech (CSE) Program for the academic year 2025-26 as approved by all the members.(Refer Annexure-I)

**4. Course Structure for M.Tech Syllabi–R25**

The Chairman, BOS (CSE) presented the course structure and Syllabi of M.Tech(CSE) courses for syllabus of II,III & IV Semester & Open Elective-I after thorough discussion and taking into consideration of the suggestions and remarks given by the members. (Refer Annexure – II)

The Members of BoS made the following suggestions for R25- M.Tech (CSE) II,III & IV Semester Dr. Humera Khanam suggested to follow as per JNTUA syllabi and also

The suggestion is accepted and incorporated.

Also madam, suggested not to change the course name is already available for other branches under regular course, so assign a new course code for the same.

The suggestion is accepted and incorporated.

i) Dr. N. Usha Rani suggested to follow as per JNTUA syllabi

The suggestion is accepted and incorporated.

ii)Dr. Viswananth Pulabaigari expressed his acceptance for the proposed course structure and syllabi

iv) Dr. Vikram Nerugatti expressed his acceptance for the proposed course structure and syllabi.

v) Mr. K. Dhanamjayan expressed his acceptance for the proposed course structure and syllabi.

**5. Approval for Panel of Question Paper Setter and Examiner**

- i) The Chairman, BOS (M.Tech-CSE) presented the Panel of Question Paper Setter and Examiner to the members. (Refer Annexure – IV)
- ii) All the members Approved and accepted the Panel of Question Paper Setter and Examiner.

**6. Approval for Faculty Development Programs and Student Development Activities**

All the members Approved and accepted the Faculty Development Programs and Student Development Activities.

Meeting concluded with thanks to the Chairman.



HOD / CSE -SITAMS <hodcse@sitams.org>

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## BOS Meeting Minutes - reg.

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**C. Shoba Bindu** <shobabindhu@gmail.com>  
To: HOD / CSE -SITAMS <hodcse@sitams.org>

Fri, Oct 6, 2023 at 5:44 PM

Approved  
Thanks & Regards,

Dr. C.Shoba Bindu  
Professor of CSE & Director, Research & Development  
JNT University Anantapur  
Ananthapuramu-515002.

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**SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES  
(AUTONOMOUS)**

**Department of Computer Science and Engineering**

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**Minutes of Board of Studies Meeting held on 14<sup>th</sup> September 2023 at 3.00 pm**

**Members Present:**

|   |                      |                                                         |                            |
|---|----------------------|---------------------------------------------------------|----------------------------|
| 1 | Dr. M.Saravanan      | Professor & HOD, CSE, SITAMS                            | Chairman                   |
| 2 | Dr.C.Shoba Bindu     | Professor & Director Software Development Centre, JNTUA | JNTUA Nominee (Member)     |
| 3 | Mr.K. Dhanamjayan    | Team lead, Accenture solutions pvt. Ltd, Bangalore      | Industrial Expert (Member) |
| 4 | Dr.Vikram Neerugatti | Associate professor, CSE JAIN University, Bangalore     | Alumni (Member)            |
| 5 | Dr.M.Arthi           | Professor & HOD, CSM, SITAMS                            | Internal Member            |
| 6 | Mr.A.Sreenivasan     | Associate Professor & HOD, CSD, SITAMS                  | Internal Member            |
| 7 | Dr.Saraswathi        | Associate Professor, CSE, SITAMS                        | Internal Member            |
| 8 | Mr.Purushothaman     | Associate Professor, CSE, SITAMS                        | Internal Member            |

Chairman, BOS (CSE) welcomed all the members and introduced new members to the board.

**1. Approval of Academic Rules & Regulations – B.Tech – R23**

Resolved to adopt B.Tech academic rules and regulation of R23 as approved by JNTUA, Ananthapuramu for the U.G Program for the batches of students admitted from the academic year 2023-2024. (Refer Annexure – I)

**2. Course Structure & I B.Tech Syllabi – R23**

Chairman, BOS (CSE) presented the course structure and Syllabi of CSE relevant courses for I B.Tech all branches to the members. It is resolved to accept the course structure and Syllabi of I B.Tech CSE after thorough discussion and taking into consideration of the suggestions and remarks given by the members. (Refer Annexure – II)

Dr.C.Shoba Bindu suggested to change the text book of Introduction to programming course, instead of “Schaum’s Outline of Programming with C by Byron S Gottfried” use “C Programming, A Problem Solving Approach by Forouzan”. The changes were made as per the suggestions

Also madam, suggested to change Engineering Physics and Engineering Chemistry courses in different semesters instead of in II semester alone. Also advised to check with other boards comments on the same and decide.

As this is common course structure to ECE, EEE, Mechanical & Civil, no comments received from those respective boards and resolved to continue the same structure as presented.

Dr. Vikram Neerugatti & Mr. K. Dhanamjayan expressed their acceptance for the proposed course structure and syllabi, suggested to teach python programming in the begging stated of courses itself. Dr.Arthi, Internal Members replied that, Python programming proposed in the 2<sup>nd</sup> year level itself as no place to accommodate it in 1<sup>st</sup> year level.

### **3. Any other item**

Resolved to authorize the chairman BOS to prepare the detailed course structure and Syllabi of II, III & IV B.Tech including electives for R23.

Meeting concluded with thanks to the Chair.

| S. No. | Name of the Member    | Designation                         | Signature |
|--------|-----------------------|-------------------------------------|-----------|
| 1      | Dr. M.Saravanan       | Chairman                            |           |
| 2      | Dr.C.Shoba Bindu      | External Member (JNTUA Nominee)     |           |
| 3      | Mr.K. Dhanamjayan     | External Member (Industrial Expert) |           |
| 4      | Dr. Vikram Neerugatti | External Member (Alumni)            |           |
| 5      | Dr.M.Arthi            | Internal Member                     |           |
| 6      | Mr.A.Sreenivasan      | Internal Member                     |           |
| 7      | Dr.Saraswathi         | Internal Member                     |           |
| 8      | Mr.Purushothaman      | Internal Member                     |           |

Dr. M.SARAVANAN  
Chairman, BOS in CSE

**B.Tech R23 - COURSE STRUCTURE AND SYLLABI****Semester I (First Year)**

| S.No                   | Course Code | Course Title                                    | Scheme of Instructions<br>Hours per Week |   |    |     | Scheme of Examination<br>Maximum Marks |     |       |
|------------------------|-------------|-------------------------------------------------|------------------------------------------|---|----|-----|----------------------------------------|-----|-------|
|                        |             |                                                 | L                                        | T | P  | C   | I                                      | E   | Total |
| 1                      |             | Communicative English                           | 2                                        | 0 | 0  | 2   | 30                                     | 70  | 100   |
| 2                      |             | Linear Algebra and Calculus                     | 2                                        | 1 | 0  | 3   | 30                                     | 70  | 100   |
| 3                      |             | Basic Electrical and Electronics Engineering    | 2                                        | 1 | 0  | 3   | 30                                     | 70  | 100   |
| 4                      |             | Engineering Graphics                            | 1                                        | 0 | 4  | 3   | 30                                     | 70  | 100   |
| 5                      |             | Introduction to Programming                     | 2                                        | 1 | 0  | 3   | 30                                     | 70  | 100   |
| 6                      |             | Communicative English Lab                       | 0                                        | 0 | 2  | 1   | 30                                     | 70  | 100   |
| 7                      |             | Computer Programming Lab                        | 0                                        | 0 | 3  | 1.5 | 30                                     | 70  | 100   |
| 8                      |             | Electrical and Electronics Engineering Workshop | 0                                        | 0 | 3  | 1.5 | 30                                     | 70  | 100   |
| 9                      |             | IT Workshop                                     | 0                                        | 0 | 2  | 1   | 30                                     | 70  | 100   |
| 10                     |             | NSS/NCC/Scouts & Guides/Community Service       | 0                                        | 0 | 1  | 0.5 | -                                      | -   | 100   |
| Contact Hours per week |             |                                                 | 9                                        | 3 | 15 | -   | -                                      | -   | -     |
| Total Hours per week   |             |                                                 | 27                                       |   |    |     | -                                      | -   | -     |
| Total credits          |             |                                                 | 19.5                                     |   |    |     | -                                      | -   | -     |
| Total Marks            |             |                                                 |                                          |   |    |     | 270                                    | 630 | 1000  |

**Semester II (First Year)**

| S.No                   | Course Code | Course Title                               | Scheme of Instructions<br>Hours per Week |   |    |     | Scheme of Examination<br>Maximum Marks |     |       |
|------------------------|-------------|--------------------------------------------|------------------------------------------|---|----|-----|----------------------------------------|-----|-------|
|                        |             |                                            | L                                        | T | P  | C   | I                                      | E   | Total |
| 1                      |             | Differential Equations and Vector Calculus | 2                                        | 1 | 0  | 3   | 30                                     | 70  | 100   |
| 2                      |             | Engineering Chemistry                      | 3                                        | 0 | 0  | 3   | 30                                     | 70  | 100   |
| 3                      |             | Engineering Physics                        | 3                                        | 0 | 0  | 3   | 30                                     | 70  | 100   |
| 4                      |             | Basic Civil and Mechanical Engineering     | 3                                        | 0 | 0  | 3   | 30                                     | 70  | 100   |
| 5                      |             | Data Structures                            | 2                                        | 1 | 0  | 3   | 30                                     | 70  | 100   |
| 6                      |             | Engineering Chemistry Lab                  | 0                                        | 0 | 2  | 1   | 30                                     | 70  | 100   |
| 7                      |             | Engineering Physics Lab                    | 0                                        | 0 | 2  | 1   | 30                                     | 70  | 100   |
| 8                      |             | Engineering Workshop                       | 0                                        | 0 | 3  | 1.5 | 30                                     | 70  | 100   |
| 9                      |             | Data Structures Lab                        | 0                                        | 0 | 3  | 1.5 | 30                                     | 70  | 100   |
| 10                     |             | Health and wellness, Yoga and sports       | 0                                        | 0 | 1  | 0.5 | -                                      | -   | 100   |
| Contact Hours per week |             |                                            | 13                                       | 2 | 11 | -   | -                                      | -   | -     |
| Total Hours per week   |             |                                            | 26                                       |   |    |     | -                                      | -   | -     |
| Total credits          |             |                                            | 20.5                                     |   |    |     | -                                      | -   | -     |
| Total Marks            |             |                                            |                                          |   |    |     | 270                                    | 630 | 1000  |

**INTRODUCTION TO PROGRAMMING**  
(Common to all Branches)

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

**PRE-REQUISITES: Nil**

**COURSE EDUCATIONAL OBJECTIVES:**

1. To introduce students to the fundamentals of computer programming.
2. To provide logical thinking and problem-solving skills using control structures.
3. To familiarize students with programming concepts such as data types, arrays and strings.
4. To introduce the concepts of pointers and user-defined data types.
5. To encourage the students with functions and file handling mechanisms.

**UNIT- 1 Introduction to Programming and Problem Solving (10)**

History of Computers, Basic organization of a computer: ALU, input-output units, memory, program counter, Introduction to Programming Languages, Basics of a Computer Program- Algorithms, flowcharts. Introduction to Compilation and Execution, Primitive Data Types, Variables, and Constants, Basic Input and Output, Operators and Expressions, Type Conversion, and Casting.

Problem solving techniques: Algorithmic approach, characteristics of algorithm, Problem solving strategies: Top-down approach, Bottom-up approach, Time and space complexities of algorithms.

**UNIT- 2 Control Structures (8)**

Simple sequential programs, Conditional Statements (if, if-else, switch), Loops (for, while, do-while). Break and Continue.

**UNIT- 3 Arrays and Strings (9)**

Arrays indexing, memory model, programs with array of integers, two dimensional arrays. Strings-Declaring and Initializing String Variables, Reading string from terminal, Writing string to the screen, String Handling Functions.

**UNIT-4 Pointers & User Defined Data types (9)**

Pointers, dereferencing and address operators, pointer and address arithmetic, array manipulation using pointers. User-defined data types-Structures and Unions.

**UNIT-5 Functions & File Handling (9)**

Introduction to Functions, Function Declaration and Definition, Function call Return Types and Arguments, modifying parameters inside functions using pointers, arrays as parameters. Scope and Lifetime of Variables. File Handling- Basic Operations on Files – File Handling Function.

**TOTAL HOURS: 45**

**COURSE OUTCOMES:**

| On successful completion of the course the student will be able to, |                                                                                              | POs related to COs        |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------|
| <b>CO1</b>                                                          | Understand basics of computers, the concept of algorithm and algorithmic thinking.           | <b>PO1, PO2</b>           |
| <b>CO2</b>                                                          | Analyze a problem and develop an algorithm and program using control structures to solve it. | <b>PO1, PO2, PO3</b>      |
| <b>CO3</b>                                                          | Implement various programming concepts using arrays and strings.                             | <b>PO1, PO2, PO3, PO4</b> |
| <b>CO4</b>                                                          | Understand and implement more advanced features of pointers and user-defined data types.     | <b>PO1, PO2, PO5</b>      |
| <b>CO5</b>                                                          | Develop problem-solving using functions and file handling concepts.                          | <b>PO1, PO3, PO4, PO5</b> |

**TEXT BOOKS:**

1. "The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice-Hall, 1988
2. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3<sup>rd</sup> edition

**REFERENCE BOOKS:**

1. Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.
2. Programming in C, Rema Theraja, Oxford, 2016, 2<sup>nd</sup> edition
3. Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

**REFERENCE WEBSITES:**

1. [https://onlinecourses.swayam2.ac.in/cec22\\_cs11](https://onlinecourses.swayam2.ac.in/cec22_cs11)
2. [https://onlinecourses.nptel.ac.in/noc22\\_cs40](https://onlinecourses.nptel.ac.in/noc22_cs40)
3. <https://www.geeksforgeeks.org>

**CO-PO MAPPING:**

| CO-PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1   | 3   | 3   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    |
| CO2   | 3   | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    |
| CO3   | 3   | 3   | 2   | 3   | -   | -   | -   | -   | -   | -    | -    | -    |
| CO4   | 3   | 3   | -   | -   | 3   | -   | -   | -   | -   | -    | -    | -    |
| CO5   | 3   | -   | 3   | 3   | 3   | -   | -   | -   | -   | -    | -    | -    |
| CO*   | 3   | 3   | 2   | 3   | 3   | -   | -   | -   | -   | -    | -    | -    |

## **I B.Tech. – I Semester**

### **COMPUTER PROGRAMMING LAB (Common to All Branches)**

| <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b>   |
|----------|----------|----------|------------|
| <b>0</b> | <b>0</b> | <b>3</b> | <b>1.5</b> |

#### **PRE-REQUISITES: Nil**

#### **COURSE EDUCATIONAL OBJECTIVES:**

1. To provide knowledge on flowchart and algorithm to the given problem
2. To exercise conditional and iterative statements to write C programs
3. To develop the skill of C programs using arrays, strings and functions.
4. To understand C programs using pointers, Structures and union.
5. To familiarize with file handling techniques.

#### **Week 1**

Familiarization with programming environment

- i) Basic Linux environment and its editors like Vi, Vim & Emacs etc.
- ii) Exposure to Turbo C, gcc
- iii) Writing simple programs using printf(), scanf()

#### **Week 2**

Converting algorithms/flow charts into C Source code.

Developing the algorithms/flowcharts for the following sample programs

- i) Sum and average of 3 numbers
- ii) Conversion of Fahrenheit to Celsius and vice versa
- iii) Simple interest Calculation

#### **Week 3**

Simple computational problems using arithmetic expressions.

- i) Finding the square root of a given number
- ii) Finding compound interest
- iii) Area of a triangle using heron's formulae
- iv) Distance travelled by an object

#### **Week 4**

Simple computational problems using the operator' precedence and associativity

- i) Evaluate the following expressions.
  - a.  $A+B*C+(D*E) + F*G$
  - b.  $A/B*C-B+A*D/3$
  - c.  $A++++B---A$
  - d.  $J= (i++) + (++i)$
- ii) Find the maximum of three numbers using conditional operator
- iii) Take marks of 5 subjects in integers, and find the total, average in float

#### **Week 5**

Problems involving if-then-else structures.

- i) Write a C program to find the max and min of four numbers using if-else.
- ii) Write a C program to generate electricity bill.
- iii) Find the roots of the quadratic equation.
- iv) Write a C program to simulate a calculator using switch case.
- v) Write a C program to find the given year is a leap year or not.

#### **Week 6**

Iterative problems e.g., the sum of series

- i) Find the factorial of given number using any loop.
- ii) Find the given number is a prime or not.

- iii) Compute sine and cos series
- iv) Checking a number palindrome
- v) Construct a pyramid of numbers

### **Week 7**

1D Array manipulation, linear search

- i) Find the min and max of a 1-D integer array.
- ii) Perform linear search on 1D array.
- iii) The reverse of a 1D integer array
- iv) Find 2's complement of the given binary number.
- v) Eliminate duplicate elements in an array.

### **Week 8**

Matrix problems, String operations, Bubble sort

- i) Addition of two matrices
- ii) Multiplication two matrices
- iii) Sort array elements using bubble sort
- iv) Concatenate two strings without built-in functions
- v) Reverse a string using built-in and without built-in string functions

### **Week 9**

Pointers

- i) Write a C program to find the sum of a 1D array using pointers
- ii) Enter n students data using Pointers and display failed students list
- iii) Demonstrate the arithmetic operations using pointers.
- iv) Write a C Program using Pointers to Read in an Array of Integers and Print its Elements in Reverse Order

### **Week 10**

Structures and Unions

- i) Demonstrate the differences between structures and unions using a C program.
- ii) Write a C program to find the total, average of n students using structures
- iii) Write a C program to copy one structure variable to another structure of the same type.
- iv) Write a C program to shift/rotate using bit fields.

### **Week 11**

Simple functions using call by value, solving differential equations using Euler's theorem.

- i) Write a C function to calculate NCR value.
- ii) Write a C function to find the length of a string.
- iii) Write a C function to transpose of a matrix.
- iv) Write a C function to demonstrate numerical integration of differential equations using Euler's method

### **Week 12**

Recursive functions

- i) Write a recursive function to generate Fibonacci series.
- ii) Write a recursive function to find the GCD of two numbers.
- iii) Write a recursive function to find the factorial of a number.
- iv) Write a recursive function to find the sum of series.

### **Week 13**

Simple functions using Call by reference.

- i) Write a C program to swap two numbers using call by reference.
- ii) Write a C program to copy one string into another using pointer.
- iii) Write a C program to find no of lowercase, uppercase, digits and other characters using pointers.

## Week 14

### File operations

- Write a C program to write and read text into a file.
- Write a C program to write and read text into a binary file using fread() and fwrite()
- Copy the contents of one file to another file.
- Write a C program to merge two files into the third
- Write a C program to print last n characters of a given file.

**Total Hours: 45**

### COURSE OUTCOMES:

| After the successful completion of this course, the students able to: |                                                                                                            | POs related to COs |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------|
| <b>CO1</b>                                                            | Read and understand the execution of programs written in C language.                                       | <b>PO1</b>         |
| <b>CO2</b>                                                            | Analyze the programs on control statements and arrays.                                                     | <b>PO2</b>         |
| <b>CO3</b>                                                            | Design C programs which utilize memory efficiently using programming constructs like pointers.             | <b>PO3</b>         |
| <b>CO4</b>                                                            | Develop the programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C | <b>PO4</b>         |
| <b>CO5</b>                                                            | Analyze and implement the advanced concepts on functions and File handling techniques.                     | <b>PO5</b>         |
| <b>CO6</b>                                                            | Follow the ethical principles in implementing the programs                                                 | <b>PO8</b>         |
| <b>CO7</b>                                                            | Do experiments effectively as an individual and as a team member in a group.                               | <b>PO9</b>         |
| <b>CO8</b>                                                            | Communicate verbally and in written form, the understanding about the experiments.                         | <b>PO10</b>        |
| <b>CO9</b>                                                            | Continue updating their skill related to loops, pointers and files, implementing programs in future.       | <b>PO12</b>        |

### TEXT BOOKS:

- Ajay Mittal, Programming in C: A practical approach, Pearson.
- Byron Gottfried, Schaum's Outline of Programming with C, McGraw Hill

### REFERENCE BOOKS:

- Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice-Hall of India
- C Programming, A Problem-Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE

### REFERENCE WEBSITES:

- [https://onlinecourses.swayam2.ac.in/cec22\\_cs11](https://onlinecourses.swayam2.ac.in/cec22_cs11)
- [https://onlinecourses.nptel.ac.in/noc22\\_cs40](https://onlinecourses.nptel.ac.in/noc22_cs40)
- <https://www.geeksforgeeks.org>

### CO-PO MAPPING:

| CO-PO      | PO 1     | PO 2     | PO3      | PO4      | PO5      | PO6 | PO7 | PO8      | PO9      | PO10     | PO11 | PO12     |
|------------|----------|----------|----------|----------|----------|-----|-----|----------|----------|----------|------|----------|
| <b>CO1</b> | 3        | -        | -        | -        | -        | -   | -   | -        | -        | -        | -    | -        |
| <b>CO2</b> | -        | 3        | -        | -        | -        | -   | -   | -        | -        | -        | -    | -        |
| <b>CO3</b> | -        | -        | 3        | -        | -        | -   | -   | -        | -        | -        | -    | -        |
| <b>CO4</b> | -        | -        | -        | 3        | -        | -   | -   | -        | -        | -        | -    | -        |
| <b>CO5</b> | -        | -        | -        | -        | 3        | -   | -   | -        | -        | -        | -    | -        |
| <b>CO6</b> | -        | -        | -        | -        | -        | -   | -   | 3        | -        | -        | -    | -        |
| <b>CO7</b> | -        | -        | -        | -        | -        | -   | -   | -        | 3        | -        | -    | -        |
| <b>CO8</b> | -        | -        | -        | -        | -        | -   | -   | -        | -        | 3        | -    | -        |
| <b>CO9</b> | -        | -        | -        | -        | -        | -   | -   | -        | -        | -        | -    | 3        |
| <b>CO*</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>3</b> | -   | -   | <b>3</b> | <b>3</b> | <b>3</b> | -    | <b>3</b> |

## I B.Tech. – II Semester

### DATA STRUCTURES (Common to CSE and Allied branches)

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

#### PRE-REQUISITES: Computer Programming

#### COURSE OBJECTIVES:

1. To provide the knowledge of basic data structures and their implementations.
2. To understand importance of data structures in context of linked list concept.
3. To develop skills to apply appropriate data structures in problem solving using stacks.
4. To understand and implement the data structures using queue concept.
5. To provide knowledge about trees and hashing concepts.

#### UNIT-1

(9)

**Introduction to Linear Data Structures:** Definition and importance of Linear data structures, Abstract data types (ADTs) and their implementation, Overview of time and space complexity analysis for linear data structures. Searching Techniques: Linear & Binary Search, Sorting Techniques: Bubble sort, Selection sort, Insertion Sort

#### UNIT- 2

(9)

**Linked Lists:** Singly linked lists: representation and operations, doubly linked lists and circular linked lists, Comparing arrays and linked lists, Applications of linked lists.

#### UNIT- 3

(9)

**Stacks:** Introduction to stacks: properties and operations, implementing stacks using arrays and linked lists, Applications of stacks in expression evaluation, backtracking, reversing list etc.

#### UNIT- 4

(9)

**Queues:** Introduction to queues: properties and operations, implementing queues using arrays and linked lists, Applications of queues in breadth-first search, scheduling, etc.

**Deque:** Introduction to deque (double-ended queues), Operations on deque and their applications.

#### UNIT-5

(9)

**Trees:** Introduction to Trees, Binary Search Tree – Insertion, Deletion & Traversal

**Hashing: Brief** introduction to hashing and hash functions, Collision resolution techniques: chaining and open addressing, Hash tables: basic implementation and operations, Applications of hashing in unique identifier generation, caching, etc.

**Total Hours: 45**

#### Course Outcomes

| On the successful completion of this course, the student should be able to, |                                                                                                                       | POs related to COs |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------|
| CO1                                                                         | Explain the role of linear data structures in organizing and accessing data efficiently in algorithms.                | PO1, PO2           |
| CO2                                                                         | Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation. | PO1, PO2           |
| CO3                                                                         | Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems       | PO1, PO2, PO3,     |

|            |                                                                                                                                                                                                                        |                        |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>C04</b> | Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues, and apply them appropriately to solve data management challenges. | <b>P01, P03,P04</b>    |
| <b>C05</b> | Devise novel solutions to small scale programming challenges involving data structures such as stacks, queues, Trees.                                                                                                  | <b>P01,P03,P04,P05</b> |

#### Text books:

1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2<sup>nd</sup> Edition.
2. Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, Silicon Press, 2008

#### Reference Books:

1. Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
2. C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
3. Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
5. Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

#### Reference Websites

1. <https://nptel.ac.in/courses/106/102/106102064/>
2. <https://nptel.ac.in/courses/106/106/106106127/>

#### CO-PO Mapping

| CO-PO      | PO1      | PO2      | PO3      | PO4      | PO5      | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------------|----------|----------|----------|----------|----------|-----|-----|-----|-----|------|------|------|
| <b>C01</b> | 3        | 3        | -        | -        | -        | -   | -   | -   | -   | -    | -    | -    |
| <b>C02</b> | 3        | 3        | -        | -        | -        | -   | -   | -   | -   | -    | -    | -    |
| <b>C03</b> | 3        | 2        | 2        | -        | -        | -   | -   | -   | -   | -    | -    | -    |
| <b>C04</b> | 3        | -        | 3        | 3        | -        | -   | -   | -   | -   | -    | -    | -    |
| <b>C05</b> | 3        | -        | 2        | 2        | 2        | -   | -   | -   | -   | -    | -    | -    |
| <b>CO*</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>2</b> | <b>2</b> | -   |     |     |     |      |      |      |

## **I B.Tech. – II Semester**

### **DATA STRUCTURES LAB** **(Common to CSE and Allied branches)**

| <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b>   |
|----------|----------|----------|------------|
| <b>0</b> | <b>0</b> | <b>3</b> | <b>1.5</b> |

#### **PRE-REQUISITES: Computer Programming**

#### **COURSE OBJECTIVES:**

1. To strengthen the ability of the students to identify the problem.
2. To apply the suitable datastructure for the given real-world problem.
3. To understand the knowledge about linear data structure.
4. To understand and analyze the data structure concepts using non-linear data structures.
5. To gain knowledge in practical applications of data structures.

#### **List of Experiments:**

##### **1: Array Manipulation**

- i) Write a program to reverse an array.
- ii) C Programs to implement the Searching Techniques – Linear & Binary Search
- iii) C Programs to implement Sorting Techniques – Bubble, Selection and Insertion Sort

##### **2: Linked List Implementation**

- i) Implement a singly linked list and perform insertion and deletion operations.
- ii) Develop a program to reverse a linked list iteratively and recursively.
- iii) Solve problems involving linked list traversal and manipulation.

##### **3: Linked List Applications**

- i) Create a program to detect and remove duplicates from a linked list.
- ii) Implement a linked list to represent polynomials and perform addition.
- iii) Implement a double-ended queue (deque) with essential operations.

##### **4: Double Linked List Implementation**

- i) Implement a doubly linked list and perform various operations to understand its properties and applications.
- ii) Implement a circular linked list and perform insertion, deletion, and traversal.

##### **5: Stack Operations**

- i) Implement a stack using arrays and linked lists.
- ii) Write a program to evaluate a postfix expression using a stack.
- iii) Implement a program to check for balanced parentheses using a stack.

##### **6: Queue Operations**

- i) Implement a queue using arrays and linked lists.
- ii) Develop a program to simulate a simple printer queue system.
- iii) Solve problems involving circular queues.

##### **7: Stack and Queue Applications**

- i) Use a stack to evaluate an infix expression and convert it to postfix.
- ii) Create a program to determine whether a given string is a palindrome or not.
- iii) Implement a stack or queue to perform comparison and check for symmetry.

##### **8: Binary Search Tree**

- i) Implementing a BST using Linked List.

- ii) Traversing of BST.

## 9: Hashing

- i) Implement a hash table with collision resolution techniques.
- ii) Write a program to implement a simple cache using hashing.

**Total Hours: 45**

## COURSE OUTCOMES

| On the successful completion of this course, the student should be able to, |                                                                                                                                                                                                                       | POs related to COs |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>CO1</b>                                                                  | Explain the role of linear data structures in organizing and accessing data efficiently in algorithms                                                                                                                 | <b>PO1</b>         |
| <b>CO2</b>                                                                  | Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation.                                                                                                 | <b>PO2</b>         |
| <b>CO3</b>                                                                  | Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems                                                                                                       | <b>PO3</b>         |
| <b>CO4</b>                                                                  | Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues and apply them appropriately to solve data management challenges. | <b>PO4</b>         |
| <b>CO5</b>                                                                  | Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.                                                                                                             | <b>PO5</b>         |
| <b>CO6</b>                                                                  | Follow the ethical principles in implementing the programs                                                                                                                                                            | <b>PO8</b>         |
| <b>CO7</b>                                                                  | Do experiments effectively as an individual and as a team member in a group.                                                                                                                                          | <b>PO9</b>         |
| <b>CO8</b>                                                                  | Communicate verbally and in written form, the understanding about the experiments.                                                                                                                                    | <b>PO10</b>        |
| <b>CO9</b>                                                                  | Continue updating their skill related to loops, pointers and files, implementing programs in future.                                                                                                                  | <b>PO12</b>        |

**Textbooks:**

1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2<sup>nd</sup> Edition.
2. Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, Silicon Press, 2008

### Reference Books:

1. Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
2. C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
3. Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein  
Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms by Robert Sedgwick.

### Reference Websites:

1. <https://nptel.ac.in/courses/106/102/106102064/>
2. <https://nptel.ac.in/courses/106/106/106106127/>

## CO-PO MAPPING

[illegible]

|            |          |          |          |   |          |   |   |          |          |          |   |          |
|------------|----------|----------|----------|---|----------|---|---|----------|----------|----------|---|----------|
| <b>C02</b> | -        | 3        | -        | - | -        | - | - | -        | -        | -        | - | -        |
| <b>C03</b> | -        | -        | 3        | - | -        | - | - | -        | -        | -        | - | -        |
| <b>C04</b> | -        | -        | -        | 3 | -        | - | - | -        | -        | -        | - | -        |
| <b>C05</b> | -        | -        | -        | - | 3        | - | - | -        | -        | -        | - | -        |
| <b>C06</b> | -        | -        | -        | - | -        | - | - | 3        | -        | -        | - | -        |
| <b>C07</b> | -        | -        | -        | - | -        | - | - | -        | 3        | -        | - | -        |
| <b>C08</b> | -        | -        | -        | - | -        | - | - | -        | -        | 3        | - | -        |
| <b>C09</b> | -        | -        | -        | - | -        | - | - | -        | -        | -        | - | 3        |
| <b>CO*</b> | <b>3</b> | <b>3</b> | <b>3</b> | - | <b>3</b> | - | - | <b>3</b> | <b>3</b> | <b>3</b> | - | <b>3</b> |

## **I B.Tech. – I Semester**

### **IT WORKSHOP LAB (Common to all branches of Engineering)**

| <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
|----------|----------|----------|----------|
| <b>0</b> | <b>0</b> | <b>2</b> | <b>1</b> |

#### **PRE-REQUISITES: Nil**

#### **COURSE OBJECTIVES:**

1. To introduce the internal parts of a computer, peripherals, I/O ports, connecting cables.
2. To demonstrate configuring the system as Dual boot both Windows and other Operating Systems Viz. Linux, BOSS
3. To teach basic command line interface commands on Linux.
4. To teach the usage of Internet for productivity and self-paced life-long learning
5. To introduce Compression, Multimedia and Antivirus tools and Office Tools such as Word processors, Spread sheets and Presentation tools.

#### **List of Experiments:**

##### **PC Hardware & Software Installation**

1. Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.
2. Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.
3. Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.
4. Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot (VMWare) with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva
5. Every student should install BOSS on the computer. The system should be configured as dual boot (VMWare) with both Windows and BOSS. Lab instructors should verify the installation and follow it up with a Viva

##### **Internet & World Wide Web**

6. Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.
7. Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.
8. Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.
9. Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

##### **LaTeX and WORD**

10. Word Orientation: The mentor needs to give an overview of La TeX and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of La TeX and MS office or equivalent (FOSS) tool Word

as word Processors, Details of the four tasks and features that would be covered in each, Using La TeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

11. Using La TeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both La TeX and Word.

12. Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

13. Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

## **EXCEL**

**Excel Orientation:** The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

14. Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

15. Calculating GPA -. Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function,

## **LOOKUP/VLOOKUP**

16. Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

## **POWER POINT**

17. Students will be working on basic power point utilities and tools which help them create basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

18. Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

19. Master Layouts (slide, template, and notes), Types of views (basic, presentation, slideslotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

## **AI TOOLS – ChatGPT**

20. Prompt Engineering: Experiment with different types of prompts to see how the model responds. Try asking questions, starting conversations, or even providing incomplete sentences to see how the model completes them.

- Ex: Prompt: "You are a knowledgeable AI. Please answer the following question: What is the capital of France?"

21. Creative Writing: Use the model as a writing assistant. Provide the beginning of a story or a description of a scene, and let the model generate the rest of the content. This can be a fun way to brainstorm creative ideas

- Ex: Prompt: "In a world where gravity suddenly stopped working, people started floating upwards. Write a story about how society adapted to this new reality."

22. Language Translation: Experiment with translation tasks by providing a sentence in one language and asking the model to translate it into another language. Compare the output to see how accurate and fluent the translations are.

- Ex: Prompt: "Translate the following English sentence to French: 'Hello, how are you doing today?'"

**Course Outcomes:**

| On the successful completion of this course, the student should be able to, |                                                                                                                                                                                                                                              | POs related to COs |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>CO1</b>                                                                  | Acquire knowledge on computer system such as system unit, input devices, and output devices connected to the computer.                                                                                                                       | <b>PO1</b>         |
| <b>CO2</b>                                                                  | Demonstrate the booting process that includes switching on the system, execution of POST routine, then bootstrap loader, and loading of the operating system, and getting it ready for use.                                                  | <b>PO2</b>         |
| <b>CO3</b>                                                                  | Demonstrate the working of the internet that include the use of protocols, domains, IP addresses, URLs, web browsers, web servers, mail-servers, etc.                                                                                        | <b>PO3</b>         |
| <b>CO4</b>                                                                  | Familiarize with parts of MS Office, To create and save a document, To set page settings, create headers and footers, To use various formatting features such as bold face, italicize, underline, subscript, superscript, line spacing, etc. | <b>PO4</b>         |
| <b>CO5</b>                                                                  | Prompt the diferent types of questions using CHATBOT                                                                                                                                                                                         | <b>PO5</b>         |
| <b>CO6</b>                                                                  | Follow the ethical principles in implementing the programs                                                                                                                                                                                   | <b>PO8</b>         |
| <b>CO7</b>                                                                  | Do experiments effectively as an individual and as a team member in a group.                                                                                                                                                                 | <b>PO9</b>         |
| <b>CO8</b>                                                                  | Communicate verbally and in written form, the understanding about the experiments                                                                                                                                                            | <b>PO10</b>        |
| <b>CO9</b>                                                                  | Continue updating their skill related to MS Office, Internet and Computer in future.                                                                                                                                                         | <b>PO12</b>        |

**Text Books:**

1. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dream tech, 2003
2. The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dream tech, 2013, 3rd edition

### Reference Books:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education, 2012, 2<sup>nd</sup> edition
2. PC Hardware - A Handbook, Kate J. Chase, PHI (Microsoft)
3. LaTeX Companion, Leslie Lamport, PHI/Pearson.
4. IT Essentials PC Hardware and Software Companion Guide, David Anfinson and Ken Quamme. – CISCO Press, Pearson Education, 3<sup>rd</sup> edition
5. IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan– CISCOPress, Pearson Education, 3<sup>rd</sup> edition

## CO-PO Mapping

[illegible]

|            |          |          |          |          |          |   |   |          |          |          |   |          |
|------------|----------|----------|----------|----------|----------|---|---|----------|----------|----------|---|----------|
| <b>C03</b> | -        | -        | 3        | -        | -        | - | - | -        | -        | -        | - | -        |
| <b>C04</b> | -        | -        | -        | 3        | -        | - | - | -        | -        | -        | - | -        |
| <b>C05</b> | -        | -        | -        | -        | 3        | - | - | -        | -        | -        | - | -        |
| <b>C06</b> | -        | -        | -        | -        | -        | - | - | 3        | -        | -        | - | -        |
| <b>C07</b> | -        | -        | -        | -        | -        | - | - | -        | 3        | -        | - | -        |
| <b>C08</b> | -        | -        | -        | -        | -        | - | - | -        | -        | 3        | - | -        |
| <b>C09</b> | -        | -        | -        | -        | -        | - | - | -        | -        |          | - | 3        |
| <b>C0*</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>3</b> | - | - | <b>3</b> | <b>3</b> | <b>3</b> | - | <b>3</b> |