



**SCHOOL OF ENGINEERING**

**B.SC. IT**

**SYLLABUS BOOK**

**AY 2026-27**

### INSTITUTE VISION

To emerge as an Institute of Excellence by imparting value-based education aided with Research, Innovation and Entrepreneurial skills.

### INSTITUTE MISSION

|   |                                                                                                                                                 |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | To impart the holistic engineering education of highest quality & prepare socially responsible professionals with entrepreneurial skills.       |
| 2 | To prepare value-aided engineering professionals to meet up global industry requirements by imparting cutting edge professional education.      |
| 3 | To inculcate the attitude of research and innovation among the stake holders through experiential and project-based teaching-learning pedagogy. |
| 4 | To acquire global talent pool by providing world class amenities for teaching, learning & research.                                             |

**Graduates will demonstrate ability to:**

| PEO No | PROGRAMME EDUCATIONAL OBJECTIVES                                                                                                                                                                                                |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PEO 1  | Apply software development skills and computing knowledge to design innovative applications that effectively and efficiently address business and societal challenges.                                                          |
| PEO 2  | Build successful careers as application developers, software developer, system analysts, or entrepreneurs by leveraging strong programming, problem solving and analytical abilities.                                           |
| PEO 3  | Uphold ethical practices, demonstrate effective communication and teamwork, and contribute to the continuous advancement of knowledge in rapidly evolving fields.                                                               |
| PO No  | PROGRAMME OUTCOMES                                                                                                                                                                                                              |
| PO 1   | <b>Foundational &amp; Domain Knowledge:</b> Demonstrate a solid understanding of mathematical foundations, computing principles, and domain-specific theories to model and solve complex IT problems.                           |
| PO 2   | <b>Problem Formulation &amp; Analysis:</b> Decompose and critically analyse real-world IT problems using algorithmic thinking and computational reasoning to derive structured, well-justified solutions.                       |
| PO 3   | <b>Design, Development &amp; Innovation:</b> Design, develop, and deploy innovative IT solutions that satisfy functional and non-functional requirements while adhering to engineering best practices and user-centered design. |
| PO 4   | <b>Research, Inquiry &amp; Evidence-Based Thinking:</b> Investigate complex IT challenges through research methods, data analysis, and experimentation to reach evidence-based conclusions and actionable solutions.            |
| PO 5   | <b>Modern Tools &amp; Emerging Technologies:</b> Select and apply modern tools, frameworks, and emerging technologies; including AI/ML, cloud, and DevOps to build efficient, industry-relevant IT solutions.                   |
| PO 6   | <b>Communication, Leadership &amp; Teamwork:</b> Convey technical concepts clearly and contribute effectively as a collaborator or leader within multidisciplinary teams in professional environments.                          |
| PO 7   | <b>Ethics, Society &amp; Professional Responsibility:</b> Apply ethical frameworks, legal standards, and professional norms in IT practice, with awareness of societal impact, data privacy, cybersecurity, and sustainability. |
| PO 8   | <b>Lifelong Learning &amp; Adaptability:</b> Demonstrate proactive commitment to continuous self-directed learning, staying current with technological advancements and evolving best practices throughout career.              |

| PSO No       | PROGRAMME SPECIFIC OUTCOMES (PSO)                                                                                                                                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PSO 1</b> | Graduates will design, implement, and evaluate computer-based systems, components, or programs to meet specified functional and performance requirements.                |
| <b>PSO 2</b> | Graduates will assess the local and global impact of computing technologies on individuals, organizations, and society from ethical and social perspectives.             |
| <b>PSO 3</b> | Graduates will emerge as technically competent professionals, researchers, and entrepreneurs, equipped to excel in competitive examinations and pursue advanced studies. |

### Credit Guidelines (General)

One (1) credit represents 30 hours of learning, comprising an appropriate combination of Theory, Practical, Tutorial, Project, Group Discussion, Case Study, Field Visit, Presentation, Assignment, Term Work, Self-Learning, and other curriculum-approved learning activities.

### CO-PO Mapping Guidelines

| Mapping Level | %age Mapping | Indicator                        |
|---------------|--------------|----------------------------------|
| 0             | 0            | No Mapping                       |
| 1             | 0-33         | Low Level (Slightly Mapped)      |
| 2             | 33-66        | Medium Level (Moderately Mapped) |
| 3             | >66          | High Level (Strongly Mapped)     |

# Syllabus Book



**P P Savani University**

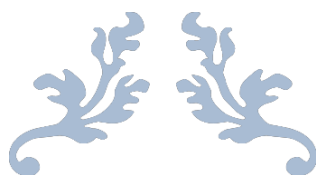
School of Engineering

Effective From: 2026-27

Authored by: P P Savani University

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## FIRST YEAR B.SC IT (2026-27)

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| P P SAVANI UNIVERSITY                                                      |             |                                    |            |                      |           |          |                        |              |            |           |               |       |        |                    |           |          |          |              |            |           |               |            |  |      |
|----------------------------------------------------------------------------|-------------|------------------------------------|------------|----------------------|-----------|----------|------------------------|--------------|------------|-----------|---------------|-------|--------|--------------------|-----------|----------|----------|--------------|------------|-----------|---------------|------------|--|------|
| INSTITUTE OF COMPUTER SCIENCE & APPLICATION                                |             |                                    |            |                      |           |          |                        |              |            |           |               |       |        |                    |           |          |          |              |            |           |               |            |  |      |
| TEACHING & EXAMINATION SCHEME FOR FIRST YEAR BSc. IT PROGRAMME AY: 2026-27 |             |                                    |            |                      |           |          |                        |              |            |           |               |       |        |                    |           |          |          |              |            |           |               |            |  |      |
| Sem                                                                        | Course Code | Course Title                       | Offered By | Teaching Scheme      |           |          |                        |              |            |           |               |       |        | Examination Scheme |           |          |          |              |            |           |               |            |  |      |
|                                                                            |             |                                    |            | Direct Contact Hours |           |          | Indirect Contact Hours |              |            |           |               | Total | Credit | Theory             | Practical | Tutorial | Project  | GD/CS/FV/PPT | Assignment | Term Work | Self Learning | Total      |  |      |
|                                                                            |             |                                    |            | Theory               | Practical | Tutorial | Project                | GD/CS/FV/PPT | Assignment | Term Work | Self Learning |       |        | CE/ESE             | CE/ESE    | CE/ESE   | CE/ESE   | CE/ESE       | CE/ESE     | CE/ESE    | CE/ESE        | CE/ESE     |  |      |
| 1                                                                          | ICASH1010   | Basic Mathematics for Computing    | S & H      | 45                   | 0         | 30       | 0                      | 0            | 30         | 0         | 15            | 120   | 04     | 30<br>50           | 0         | 30<br>50 | 0        | 0            | 20<br>00   | 0         | 20<br>00      | 100<br>100 |  |      |
|                                                                            | ICAIT1010   | Computer Organization              | IT         | 45                   | 30        | 0        | 0                      | 0            | 30         | 0         | 15            | 120   | 04     | 30<br>50           | 30<br>50  | 0        | 0        | 0            | 20<br>00   | 0         | 20<br>00      | 100<br>100 |  |      |
|                                                                            | ICACA1020   | UI/UX Design and Human Psychology  | CA         | 30                   | 30        | 0        | 30                     | 0            | 30         | 0         | 0             | 120   | 04     | 30<br>50           | 30<br>50  | 0        | 20<br>00 | 0            | 20<br>00   | 0         | 0             | 100<br>100 |  |      |
|                                                                            | ICACS1010   | Programming Fundamentals with C    | CS         | 45                   | 60        | 0        | 0                      | 0            | 15         | 0         | 0             | 120   | 04     | 30<br>50           | 30<br>50  | 0        | 0        | 0            | 40<br>00   | 0         | 0             | 100<br>100 |  |      |
|                                                                            | ICACS1030   | Prompt Engineering                 | CS         | 30                   | 30        | 0        | 0                      | 0            | 0          | 30        | 30            | 120   | 04     | 30<br>50           | 30<br>50  | 0        | 0        | 0            | 0          | 20<br>00  | 20<br>00      | 100<br>100 |  |      |
|                                                                            | CLSC2090    | Constitutional Empowerment         | CLSC       | 30                   | 0         | 0        | 0                      | 0            | 30         | 0         | 0             | 60    | 2      | 100<br>00          | 0         | 0        | 0        | 0            | 0          | 0         | 0             | 100<br>00  |  |      |
| Total                                                                      |             |                                    |            |                      |           |          |                        |              |            |           |               | 660   | 22     |                    |           |          |          |              |            |           |               |            |  | 1100 |
| 2                                                                          | ICASH1020   | Applied Statistics                 | S & H      | 45                   | 0         | 30       | 0                      | 0            | 30         | 0         | 15            | 120   | 04     | 30<br>50           | 0         | 30<br>50 | 0        | 0            | 20<br>00   | 0         | 20<br>00      | 100<br>100 |  |      |
|                                                                            | ICAIT1020   | Introduction to Database Concepts  | IT         | 45                   | 30        | 0        | 0                      | 0            | 25         | 20        | 0             | 120   | 04     | 30<br>50           | 30<br>50  | 0        | 0        | 0            | 20<br>00   | 20<br>00  | 0             | 100<br>100 |  |      |
|                                                                            | ICACA1010   | Basics of Web Designing            | CA         | 30                   | 45        | 0        | 30                     | 0            | 0          | 0         | 15            | 120   | 04     | 30<br>50           | 30<br>50  | 0        | 20<br>00 | 0            | 0          | 0         | 20<br>00      | 100<br>100 |  |      |
|                                                                            | ICACS1020   | Fundamentals of Python Programming | CS         | 30                   | 45        | 0        | 0                      | 0            | 25         | 0         | 20            | 120   | 04     | 30<br>50           | 30<br>50  | 0        | 0        | 0            | 20<br>00   | 0         | 20<br>00      | 100<br>100 |  |      |
|                                                                            | ICAIT1030   | Digital Literacy                   | IT         | 30                   | 30        | 0        | 0                      | 0            | 30         | 0         | 0             | 90    | 03     | 30<br>50           | 30<br>50  | 0        | 0        | 0            | 40<br>00   | 0         | 0             | 100<br>100 |  |      |
|                                                                            | CFLS2130    | Intermediate Communicative English | CFLS       | 45                   | 0         | 0        | 0                      | 0            | 45         | 0         | 0             | 90    | 3      | 100<br>00          | 0         | 0        | 0        | 0            | 0          | 0         | 0             | 100<br>00  |  |      |
| Total                                                                      |             |                                    |            |                      |           |          |                        |              |            |           |               | 660   | 22     |                    |           |          |          |              |            |           |               |            |  | 1100 |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Science & Humanities**

**COURSE DETAILS:**

|                       |                                 |
|-----------------------|---------------------------------|
| Course Code           | ICASH1010                       |
| Course Name           | Basic Mathematics for Computing |
| Prerequisite Course/s | None                            |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 04     | 120                  | 45                   | 00        | 30       | 00                     | 00 | 30         | 00        | 15            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 00        | 00  | 30       | 50  | 00      | 00  | 00 | 00  | 20         | 00  | 00        | 00  | 20            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Provide a strong foundation in number systems, data representation, and binary arithmetic used in computer systems.
- Develop logical reasoning skills using mathematical logic, predicates, and quantifiers for computational problem-solving.
- Apply combinatorial techniques, mathematical induction, matrices, and determinants to solve mathematical and computational problems.
- Recognize and analyze the applications of matrices, determinants, and other mathematical concepts in computer science and related domains.
- Understand and apply analytical geometry concepts to model and solve geometric problems in computational and engineering contexts.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                                                                                                                                                                         | Hours | Weightage in% |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Number System:</b><br>Introduction to Number System, Base, Types of Number Systems, Conversion Between Number Bases, Arithmetic Operations - Addition, Subtraction, Multiplication and Division for Binary, Octal, Hexadecimal Systems, Signed Unsigned Numbers, Binary Coding - BCD, ASCII, EBCDIC, Floating Point Representation of Numbers and Arithmetic | 08    | 18            |

|              |                                                                                                                                                                                                                                                     |           |             |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
|              | Operation with Normalized Floating-Point Numbers.                                                                                                                                                                                                   |           |             |
| 2            | <b>Mathematical Logic:</b><br>Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers.                                                                                                                      | 07        | 16          |
| 3            | <b>Elementary Combinatorics:</b><br>Introduction, Basic Counting Principles, Permutation and Combination, Mathematical Induction.                                                                                                                   | 07        | 16          |
| 4            | <b>Matrix Algebra:</b><br>Introduction, Types of Matrices, Operations of Matrices, Adjoint Matrices, Solution of System of Equations by Matrix Inversion Method, Applications of Matrix.                                                            | 07        | 16          |
| 5            | <b>Determinants:</b><br>Formation of Determinants, Minors and Cofactors of the Elements of a Determinant, Properties of Determinants, Applications of Determinants in Computer Science, Cramer's Rule.                                              | 08        | 17          |
| 6            | <b>Analytical Geometry:</b><br>Introduction to Cartesian coordinate system, Straight line, Slope of Straight line, Intersection of two straight lines, Equation of circle, Centre and Radius, Tangent, Equation of Parabola, Hyperbola and Ellipse. | 08        | 17          |
| <b>TOTAL</b> |                                                                                                                                                                                                                                                     | <b>45</b> | <b>100%</b> |

**LIST OF PRACTICAL / TUTORIAL:**

| Sr. No       | Practical / Tutorial     | Hours     |
|--------------|--------------------------|-----------|
| 1            | Number System-1          | 02        |
| 2            | Number System-2          | 04        |
| 3            | Mathematical Logic       | 04        |
| 4            | Elementary Combinatorics | 04        |
| 5            | Matrix Algebra-1         | 02        |
| 6            | Matrix Algebra-2         | 04        |
| 7            | Determinants-1           | 02        |
| 8            | Determinants-2           | 04        |
| 9            | Analytical Geometry-1    | 02        |
| 10           | Analytical Geometry-2    | 02        |
| <b>TOTAL</b> |                          | <b>30</b> |

**SELF-LEARNING ONLINE RESOURCES:**

| Sr. No | Link / Description                                                                                                                                                                                                                       | Self-Learning Hours |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1      | <a href="https://www.youtube.com/watch?v=xpy5NXiBFvA">https://www.youtube.com/watch?v=xpy5NXiBFvA</a><br>What is Binary Number System? Decimal to Binary Conversion, Code for Decimal to Binary conversion, Binary to Decimal conversion | 05                  |
| 2      | <a href="https://www.youtube.com/watch?v=r8yK3h3DLdA">https://www.youtube.com/watch?v=r8yK3h3DLdA</a><br>Logic and Methods of proofs                                                                                                     | 05                  |
| 3      | <a href="https://www.youtube.com/watch?v=q9PONAeOoLI">https://www.youtube.com/watch?v=q9PONAeOoLI</a>                                                                                                                                    | 05                  |

|  |                                                                                                          |  |
|--|----------------------------------------------------------------------------------------------------------|--|
|  | How to find the determinant of a 2x2 or a 3x3 matrix. Solving a system of equations using Cramer's Rule. |  |
|--|----------------------------------------------------------------------------------------------------------|--|

**COURSE EVALUATION & ASSESSMENT RUBRICS:**

| Component          | CE/ESE | Evaluation Methodology / Rubrics                                                                                                            | Marks      | Passing Marks |
|--------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Theory             | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks.        | 30         | 00            |
|                    | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                     | 50         | 20            |
| Practical          | CE     | Performance of tutorial which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks. | 30         | 00            |
|                    | ESE    | Quiz – 25Marks<br>External Viva Voce – 25 Marks                                                                                             | 50         | 20            |
| Assignment         | CE     | A single assignment comprising 30 questions covers all six modules.                                                                         | 20         | 00            |
| Self Learning      | CE     | 20 MCQ questions based on self-study resources and online learning   1 marks per question   Total = 20 marks                                | 20         | 00            |
| <b>TOTAL MARKS</b> |        |                                                                                                                                             | <b>200</b> | <b>80</b>     |

**TEXT BOOK(S):**

| Title                | Author/s      | Publication      |
|----------------------|---------------|------------------|
| Discrete Mathematics | T. Veerarajan | Tata McGraw Hill |

**REFERENCE BOOK(S):**

| Title                                                                  | Author/s                  | Publication      |
|------------------------------------------------------------------------|---------------------------|------------------|
| Discrete Mathematics and its Applications                              | Kenneth H. Rosen          | Tata McGraw Hill |
| Discrete Mathematical Structures with Applications to Computer Science | J. P. Tremblay R. Manohar | Tata McGraw Hill |
| Analytical Geometry: 2D and 3D                                         | P R Vittal                | Pearson          |
| Introduction to Computer Science                                       | ITL ESL                   | Pearson          |

**COURSE OUTCOME(S):**

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

| ICASH1010 | Basic Mathematics for Computing                                                                            |
|-----------|------------------------------------------------------------------------------------------------------------|
| CO 1      | Convert decimal to binary, octal, hexadecimal for data representation and calculate arithmetic operations. |
| CO 2      | Compute permutations and combinations on a given set of data.                                              |
| CO 3      | Apply matrix algebra to perform matrix operations and solve systems of linear equations.                   |
| CO 4      | Evaluate the solution of system if linear equations through elimination method.                            |

|      |                                                                                  |
|------|----------------------------------------------------------------------------------|
| CO 5 | Discuss the equation of straight line in different forms and related properties. |
|------|----------------------------------------------------------------------------------|

**MAPPING OF CO WITH PO:**

| ICASH1010 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 2   | 2   | 1   | 1   | 0   | 0   | 0   | 0   |
| CO 2      | 2   | 2   | 1   | 1   | 0   | 0   | 0   | 0   |
| CO 3      | 2   | 2   | 1   | 1   | 0   | 0   | 0   | 0   |
| CO 4      | 2   | 2   | 1   | 1   | 0   | 0   | 0   | 0   |
| CO 5      | 2   | 2   | 1   | 1   | 0   | 0   | 0   | 0   |

**MAPPING OF CO WITH PSO:**

| ICASH1010 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 1    | 1    | 0    |
| CO 2      | 1    | 1    | 0    |
| CO 3      | 1    | 1    | 0    |
| CO 4      | 1    | 1    | 0    |
| CO 5      | 1    | 1    | 0    |

**LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT**

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                  | RBT Level |
|-----------|--------------------------|-----------|
| 1         | Number System            | 1,2,3,5   |
| 2         | Mathematical Logic       | 1,2,4,6   |
| 3         | Elementary Combinatorics | 1,2,3,5   |
| 4         | Matrix Algebra           | 1,2,3,5   |
| 5         | Determinants             | 1,2,3,5   |
| 6         | Analytical Geometry      | 1,2,3,5   |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Information Technology**

**COURSE DETAILS:**

|                       |                       |
|-----------------------|-----------------------|
| Course Code           | ICAIT1010             |
| Course Name           | Computer Organization |
| Prerequisite Course/s | None                  |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 04     | 120                  | 45                   | 30        | 00       | 00                     | 00 | 30         | 00        | 15            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 30        | 50  | 00       | 00  | 00      | 00  | 00 | 00  | 20         | 00  | 00        | 00  | 20            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Understand the fundamental concepts of computer organization and architecture.
- Apply number systems, data representation techniques, and Boolean algebra in digital systems.
- Analyse processor organization, instruction execution cycles, and control unit operations.
- Evaluate memory hierarchy, storage systems, and input/output mechanisms.
- Develop problem-solving skills related to computer hardware organization and performance analysis.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                                                                                                                                                                              | Hours | Weightage in% |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Overview of Computer Systems: :</b><br>Definition, components and classifications (desktop, server, embedded systems). Difference between Computer Organization and Computer Architecture. Basic functional units: Input Unit, Output Unit, Memory Unit, Arithmetic and Logic Unit (ALU), Control Unit (CU). Instruction Execution Cycle: Fetch, Decode, Execute. | 09    | 22            |
| 2          | <b>Basic Computer Organization and Data Representation: :</b><br>Instruction Codes and Computer Registers; Instruction Cycle and Timing; Input-Output Basics and Interrupt Handling. Decimal, Binary, Octal and Hexadecimal Numbers; Number System Conversions; Fixed Point Representation; Signed                                                                   | 10    | 22            |

|   |                                                                                                                                                                                                                                                                                                                           |           |             |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
|   | Magnitude; 1's and 2's Complement Representation; Addition, Subtraction and Basic Logical Operations.                                                                                                                                                                                                                     |           |             |
| 3 | <b>Boolean Algebra and Logic Gates: :</b><br>Boolean Operations (AND, OR, NOT, NAND, NOR, XOR, XNOR); Laws of Boolean Algebra; De Morgan's Theorem; Karnaugh Maps (up to 4 variables); Digital Logic Gates and Truth Tables; Combinational Circuits; Encoder and Decoder Design and Implementation.                       | 06        | 15          |
| 4 | <b>Processor and Control Unit: :</b><br>Introduction to Microprocessors; Basic Components of Processor (Registers, ALU, CU); Clock Speed, Instruction Set and Processing Modes; Hardwired Control; Microprogrammed Control; Basics of RISC and CISC Architectures.                                                        | 06        | 13          |
| 5 | <b>Memory Organization: Primary Memory: :</b><br>RAM (Static and Dynamic), ROM (PROM, EPROM, EEPROM); Secondary Memory: Hard Drives and SSDs; Cache Memory (L1, L2, L3); Virtual Memory and Paging; Memory Hierarchy; Memory Access Time and Performance.                                                                 | 07        | 14          |
| 6 | <b>Input/Output Systems and Storage Devices: :</b><br>Basics of Input/Output Operations; I/O Devices; Programmed I/O; Interrupt-driven I/O; Direct Memory Access (DMA); Storage Devices: Magnetic, Optical and Solid-State Storage; RAID; Peripheral Devices including Monitors, Projectors and External Storage Devices. | 07        | 14          |
|   | <b>TOTAL</b>                                                                                                                                                                                                                                                                                                              | <b>45</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No | Practical / Tutorial                                              | Hours     |
|--------|-------------------------------------------------------------------|-----------|
| 1      | Study of Computer Hardware Components and Functional Units        | 02        |
| 2      | Number System Conversion (Decimal, Binary, Octal and Hexadecimal) | 02        |
| 3      | Binary Arithmetic Operations                                      | 02        |
| 4      | 1's and 2's Complement Arithmetic                                 | 02        |
| 5      | Verification of Boolean Algebra Laws                              | 02        |
| 6      | Implementation of Logic Gates and Truth Tables                    | 02        |
| 7      | Karnaugh Map Simplification (up to 4 Variables)                   | 02        |
| 8      | Design and Implementation of Encoder Circuits                     | 02        |
| 9      | Design and Implementation of Decoder Circuits                     | 02        |
| 10     | Simulation of Fetch-Decode-Execute Cycle                          | 02        |
| 11     | Study of Processor Registers and Instruction Execution            | 02        |
| 12     | Demonstration of Interrupt Handling                               | 02        |
| 13     | DMA Transfer Simulation                                           | 02        |
| 14     | Cache Memory and Virtual Memory Demonstration                     | 02        |
| 15     | Comparative Study of HDD, SSD and RAID Configurations             | 02        |
|        | <b>TOTAL</b>                                                      | <b>30</b> |

#### SELF-LEARNING ONLINE RESOURCES:

| Sr. No | Link / Description | Self-Learning |
|--------|--------------------|---------------|
|--------|--------------------|---------------|

|   |                                                                                                                                                                | Hours |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1 | NPTEL - <a href="https://nptel.ac.in/courses/106105163">https://nptel.ac.in/courses/106105163</a> – Computer Organization & Architecture                       | 03    |
| 2 | Neso Academy (YouTube) - Computer Organization and Architecture Playlist-<br><a href="https://nptel.ac.in/courses/106105163">nptel.ac.in/courses/106105163</a> | 03    |
| 3 | Gate Smashers (YouTube) - Computer Organization Tutorials-<br><a href="https://youtube.com/@NesoAcademy">youtube.com/@NesoAcademy</a>                          | 03    |
| 4 | Intel Product Specifications - Processor Architecture and Memory Systems -<br><a href="https://youtube.com/@GateSmashers">youtube.com/@GateSmashers</a>        | 03    |
| 5 | EE282 Computer Systems Architecture - Recorded Architecture Lectures -<br><a href="https://intel.com/processors">intel.com/processors</a>                      | 03    |

### COURSE EVALUATION & ASSESSMENT RUBRICS:

| Component          | CE/ESE | Evaluation Methodology / Rubrics                                                                                                                                                                                                                                         | Marks      | Passing Marks |
|--------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Theory             | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks.                                                                                                                                     | 30         | 00            |
|                    | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                                                                                                                                                  | 50         | 20            |
| Practical          | CE     | Performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks.                                                                                                                             | 30         | 00            |
|                    | ESE    | Quiz / Practical Performance – 25Marks<br>External Viva Voce – 25 Marks                                                                                                                                                                                                  | 50         | 20            |
| Assignment         | CE     | Assignment Evaluation Rubrics: Understanding of Concept – 5 Marks, Technical Accuracy – 5 Marks, Problem Solving Approach – 5 Marks, Presentation & Documentation – 5 Marks.<br><br>Perform storage performance comparison between HDD and SSD using benchmarking tools. | 20         | 00            |
| Self Learning      | CE     | 40 MCQ questions based on self-study resources and online learning   0.5 marks per question   Total = 20 marks                                                                                                                                                           | 20         | 00            |
| <b>TOTAL MARKS</b> |        |                                                                                                                                                                                                                                                                          | <b>200</b> | <b>80</b>     |

### TEXT BOOK(S):

| Title                        | Author/s       | Publication |
|------------------------------|----------------|-------------|
| Computer System Architecture | M. Morris Mano | Pearson     |

### REFERENCE BOOK(S):

| Title                                  | Author/s                 | Publication |
|----------------------------------------|--------------------------|-------------|
| Computer Architecture and Organization | Subrata Ghoshal          | Pearson     |
| Computer Architecture & Organization   | M. Murdocca & V. Heuring | Wiley       |

### COURSE OUTCOME(S):

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

| ICAIT1010 | Computer Organization                                                                                  |
|-----------|--------------------------------------------------------------------------------------------------------|
| CO 1      | Explain computer system organization, functional units, and instruction execution cycles.              |
| CO 2      | Apply number systems, data representation techniques, and Boolean algebra concepts in digital systems. |
| CO 3      | Analyze processor architecture, registers, instruction execution, and control unit operations.         |
| CO 4      | Evaluate memory hierarchy, cache memory, virtual memory, and storage technologies.                     |
| CO 5      | Explain input/output systems, DMA, interrupt handling, and peripheral device operations.               |

### MAPPING OF CO WITH PO:

| ICAIT1010 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 2   | 1   | 0   | 1   | 0   | 0   | 2   |
| CO 2      | 3   | 3   | 2   | 0   | 2   | 0   | 0   | 1   |
| CO 3      | 2   | 3   | 3   | 2   | 2   | 1   | 0   | 2   |
| CO 4      | 2   | 2   | 2   | 2   | 3   | 0   | 1   | 0   |
| CO 5      | 2   | 2   | 1   | 1   | 2   | 1   | 2   | 1   |

### MAPPING OF CO WITH PSO:

| ICAIT1010 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 3    | 1    | 0    |
| CO 2      | 3    | 1    | 1    |
| CO 3      | 3    | 1    | 2    |
| CO 4      | 2    | 2    | 2    |
| CO 5      | 2    | 2    | 2    |

### LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                             | RBT Level |
|-----------|-----------------------------------------------------|-----------|
| 1         | Overview of Computer Systems                        | 1,2       |
| 2         | Basic Computer Organization and Data Representation | 2,3       |
| 3         | Boolean Algebra and Logic Gates                     | 3,4       |
| 4         | Processor and Control Unit                          | 4         |
| 5         | Memory Organization                                 | 4,5       |
| 6         | Input/Output Systems and Storage Devices            | 3,5       |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Computer Application**

**COURSE DETAILS:**

|                       |                                   |
|-----------------------|-----------------------------------|
| Course Code           | ICACA1020                         |
| Course Name           | UI/UX Design and Human Psychology |
| Prerequisite Course/s | None                              |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 04     | 120                  | 30                   | 30        | 00       | 30                     | 00 | 30         | 00        | 00            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 30        | 50  | 00       | 00  | 20      | 00  | 00 | 00  | 20         | 00  | 00        | 00  | 00            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Develop a strong understanding of UI/UX design principles, Design Thinking, and User-Centered Design for creating intuitive and user-friendly digital experiences.
- Apply visual design principles, including layout, typography, color theory, whitespace, and responsive design, to build aesthetically appealing user interfaces.
- Gain practical proficiency in using Figma to create wireframes, responsive layouts, and interactive prototypes for web and mobile applications.
- Analyze user needs and behavior through human psychology, user research, personas, empathy maps, and user journey mapping to design user-centric solutions.
- Design, prototype, and evaluate interactive applications by integrating usability testing and iterative design practices to address real-world design challenges.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                             | Hours | Weightage in% |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Introduction to UI/UX and Design Thinking:</b><br>Detailed UI vs. UX dichotomies; Evolution of platforms. Step by step problem solving for design. Principles of User-Centered Design (UCD). Real World Example. | 05    | 16            |
| 2          | <b>Visual Design Fundamentals:</b><br>Basic UI layouts: Grids, layout column metrics, advanced Typography scales, and functional Color Theory, White Space,                                                         | 05    | 16            |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |             |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
|   | CRAP Principles (Contrast, Repetition, Alignment, Proximity)                                                                                                                                                                                                                                                                                                                                                                          |           |             |
| 3 | <b>Basics of Figma tool:</b><br>Beginner Figma tools: frames, shapes, text, auto layout, icons, images. Calculators, dashboards, and registration forms.                                                                                                                                                                                                                                                                              | 05        | 16          |
| 4 | <b>Wireframing &amp; Responsive Design:</b><br>Low-Fidelity analog paper layout (Paper Sketches); transitioning to Mid-Fidelity digital wireframes. Responsive breakpoint designs for Mobile, Tablet, and Desktop web environments.                                                                                                                                                                                                   | 05        | 16          |
| 5 | <b>Human Psychology and User Research:</b><br>Gestalt Principles. Architecture of Human Processing: Short-term memory constraints, recognition vs. recall benchmarks. Simple design rules: grouping, alignment, and balance. Color Psychology. User Research approaches: Qualitative interviews vs. quantitative surveys. Designing structural User Personas and Empathy Maps. User Journey Mapping (UJM) and interactive User Flows. | 06        | 20          |
| 6 | <b>Prototyping and Mini Project:</b><br>Clickable prototypes for screen navigation. Basic navigation menus and simple site maps. Usability Testing (basic), Mini Application Design.                                                                                                                                                                                                                                                  | 04        | 16          |
|   | <b>TOTAL</b>                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>30</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No | Practical / Tutorial                                                                                                                                                                                                  | Hours |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1      | Introduction to Figma: Explore the Figma interface, frames, shapes, text, icons, images, layers, and basic properties. Create a simple profile card or business card.                                                 | 03    |
| 2      | UI Analysis Activity: Analyze the UI of two popular mobile applications (e.g., WhatsApp, Instagram, Gmail). Identify good and poor UI design practices based on layout, typography, colors, spacing, and consistency. | 03    |
| 3      | Basic Interface Design: Design simple interfaces such as a Login Page, Registration Form, Calculator, and Student Information Form in Figma.                                                                          | 03    |
| 4      | Paper Wireframing: Create low-fidelity paper wireframes for a simple application (Library, Canteen, Bus Tracking, Attendance, etc.) and identify navigation between screens.                                          | 03    |
| 5      | Digital Wireframing: Convert the paper wireframes into digital wireframes using Figma. Apply grids, spacing, typography, and color styles.                                                                            | 03    |
| 6      | User Research Activity: Conduct a simple classroom survey or interview for the selected application. Prepare one User Persona and one Empathy Map based on collected responses.                                       | 03    |
| 7      | User Flow & Responsive Design: Develop a basic user flow and create responsive layouts for Mobile, Tablet, and Desktop screens using Auto Layout and constraints.                                                     | 03    |
| 8      | Reusable Components: Create a simple design system containing reusable buttons, text styles, input fields, cards, navigation bars, and color styles.                                                                  | 03    |
| 9      | Interactive Prototype: Build a clickable prototype using Figma with basic navigation between screens. Perform a simple usability test with classmates and incorporate feedback.                                       | 03    |
| 10     | Mini UI/UX Project: Design a complete UI prototype for one application such as a                                                                                                                                      | 03    |

|  |                                                                                                                                                                                                                |           |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|  | Library Management System, Restaurant Ordering App, College Event Registration App, Student Attendance System, or Personal Portfolio. Submit the prototype along with user persona, wireframes, and prototype. |           |
|  | <b>TOTAL</b>                                                                                                                                                                                                   | <b>30</b> |

**COURSE EVALUATION & ASSESSMENT RUBRICS:**

| Component          | CE/ESE | Evaluation Methodology / Rubrics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Marks      | Passing Marks |
|--------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Theory             | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 30         | 00            |
|                    | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 50         | 20            |
| Practical          | CE     | Performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 30         | 00            |
|                    | ESE    | Quiz / Practical Performance – 25Marks<br>External Viva Voce – 25 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 50         | 20            |
| Project            | CE     | Project Evaluation Rubrics: <ul style="list-style-type: none"> <li>• Problem Statement &amp; Requirement Analysis – 5 Marks</li> <li>• Design, Architecture &amp; Tool Usage – 5 Marks</li> <li>• Implementation &amp; Functionality – 5 Marks</li> <li>• Project Demonstration &amp; Viva-Voce – 5 Marks</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 20         | 00            |
| Assignment         | CE     | Assignment Questions:<br>UI Analysis & Redesign<br>Objective: Understand good vs. poor UI practices and apply design principles.<br>Representation: Students should present their redesign with before vs. after comparison, highlighting improvements.<br>User Persona & Empathy Map<br>Objective: Connect human psychology with design decisions.<br>Representation:<br>Students should submit diagrams and flowcharts with clear labels, ensuring beginner-friendly clarity.<br><br>Assignment Evaluation Scheme <ul style="list-style-type: none"> <li>• Conceptual Clarity &amp; Accuracy – 5 Marks</li> <li>• Critical Thinking &amp; Originality – 5 Marks</li> <li>• Structure &amp; Task Completion – 5 Marks</li> <li>Timely Submission &amp; Formatting – 5 Marks</li> </ul> | 20         | 00            |
| <b>TOTAL MARKS</b> |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>200</b> | <b>80</b>     |

**TEXT BOOK(S):**

| Title | Author/s | Publication |
|-------|----------|-------------|
|-------|----------|-------------|

|                                                                               |             |                                      |
|-------------------------------------------------------------------------------|-------------|--------------------------------------|
| UX Design Redefined: A Practical Guide to User Experience and Human Behavior. | Pradeep, S. | Technical Publications India. (2021) |
|-------------------------------------------------------------------------------|-------------|--------------------------------------|

### REFERENCE BOOK(S):

| Title                                                                     | Author/s      | Publication            |
|---------------------------------------------------------------------------|---------------|------------------------|
| The Design of Everyday Things                                             | Norman, D.    | Basic Books. (2013)    |
| Laws of UX: Using Psychology to Design Better Products and Services.      | Yablonski, J. | O'Reilly Media. (2020) |
| Don't Make Me Think, Revisited: A Common Sense Approach to Web Usability. | Krug, S.      | New Riders.            |

### COURSE OUTCOME(S):

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

| ICACA1020 | UI/UX Design and Human Psychology                                                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO 1      | Explain the fundamental concepts of UI, UX, Design Thinking, User-Centered Design, and visual design principles for developing effective user interfaces |
| CO 2      | Apply visual design principles and Figma tools to create wireframes, layouts, and responsive user interface designs for digital applications.            |
| CO 3      | Analyze user requirements using human psychology, user research techniques, personas, empathy maps, and user journey mapping to improve user experience. |
| CO 4      | Develop interactive prototypes and responsive interfaces by integrating wireframing, navigation, and prototyping techniques.                             |
| CO 5      | Evaluate the usability of digital interfaces through usability testing and design a user-centric application that addresses real-world user needs.       |

### MAPPING OF CO WITH PO:

| ICACA1020 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 1   | 0   | 0   | 2   | 0   | 0   | 2   |
| CO 2      | 2   | 3   | 2   | 1   | 3   | 2   | 2   | 0   |
| CO 3      | 3   | 2   | 3   | 0   | 0   | 0   | 0   | 2   |
| CO 4      | 1   | 0   | 3   | 3   | 0   | 2   | 0   | 3   |
| CO 5      | 2   | 3   | 2   | 2   | 2   | 1   | 3   | 1   |

### MAPPING OF CO WITH PSO:

| ICACA1020 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 2    | 1    | 2    |
| CO 2      | 3    | 2    | 3    |
| CO 3      | 3    | 0    | 2    |
| CO 4      | 2    | 3    | 3    |
| CO 5      | 2    | 2    | 2    |

### LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                   | RBT Level |
|-----------|-------------------------------------------|-----------|
| 1         | Introduction to UI/UX and Design Thinking | 1,2       |
| 2         | Visual Design Fundamentals                | 2,3       |
| 3         | Basics of Figma tool                      | 2,3,4     |
| 4         | Wireframing & Responsive Design           | 3,4       |
| 5         | Human Psychology and User Research        | 2, 3,4,5  |
| 6         | Prototyping and Mini Project              | 5,6       |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Computer Science**

**COURSE DETAILS:**

|                       |                                 |
|-----------------------|---------------------------------|
| Course Code           | ICACS1010                       |
| Course Name           | Programming Fundamentals with C |
| Prerequisite Course/s | None                            |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 04     | 120                  | 45                   | 60        | 00       | 00                     | 00 | 15         | 00        | 00            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 30        | 50  | 00       | 00  | 00      | 00  | 00 | 00  | 40         | 00  | 00        | 00  | 00            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Understand the fundamentals of problem solving and structured programming using the C language.
- Develop logical thinking and algorithmic problem-solving skills.
- Learn C programming constructs including data types, operators, control statements, arrays, functions, pointers, structures, and file handling.
- Design, implement, debug, and test C programs for real-world problems.
- Build a strong programming foundation for advanced computer science subjects.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                                                                                                                                                                                          | Hours | Weightage in% |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Introduction to Programming and C Fundamentals: :</b><br>Introduction to computers, programming languages, algorithms, flowcharts, program development cycle, history and features of C, structure of a C program, character set, identifiers, keywords, constants, variables, data types, operators, expressions, input/output functions (printf(), scanf()), formatted I/O. | 08    | 18            |
| 2          | <b>Decision Making and Looping: :</b><br>Conditional statements (if, if-else, nested if, switch), relational and logical operators, looping statements (while, do-while,                                                                                                                                                                                                         | 08    | 18            |

|              |                                                                                                                                                                                                                                                                                |           |             |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
|              | for), nested loops, break, continue, goto, programming exercises on pattern generation and mathematical problems.                                                                                                                                                              |           |             |
| 3            | <b>Functions and Arrays: :</b><br>User-defined functions, function declaration, definition and calling, parameter passing, recursion, scope and storage classes, one-dimensional arrays, two-dimensional arrays, strings and string handling functions, array applications.    | 10        | 22          |
| 4            | <b>Pointers and Dynamic Memory Allocation: :</b><br>Introduction to pointers, pointer arithmetic, pointers and arrays, pointers to functions, call by value and call by reference, dynamic memory allocation (malloc(), calloc(), realloc(), free()), command line arguments.  | 08        | 18          |
| 5            | <b>Structures, Unions and File Handling: :</b><br>Structures, nested structures, arrays of structures, unions, typedef, enumeration, file concepts, file opening and closing, reading and writing files, random access, error handling.                                        | 07        | 14          |
| 6            | <b>Preprocessor, Modular Programming and Applications: :</b><br>Preprocessor directives, macros, header files, conditional compilation, modular programming concepts, debugging techniques, programming best practices, mini programming applications using multiple concepts. | 04        | 10          |
| <b>TOTAL</b> |                                                                                                                                                                                                                                                                                | <b>45</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No       | Practical / Tutorial                                                                                                             | Hours     |
|--------------|----------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1            | Installation of C Compiler and writing first C program                                                                           | 02        |
| 2            | Programs using arithmetic expressions and formatted input/output                                                                 | 04        |
| 3            | Programs based on decision making statements                                                                                     | 06        |
| 4            | Programs using loops and pattern generation                                                                                      | 08        |
| 5            | Programs using functions and recursion                                                                                           | 08        |
| 6            | Programs on arrays and strings                                                                                                   | 10        |
| 7            | Programs using pointers and dynamic memory allocation                                                                            | 08        |
| 8            | Programs using structures, unions and file handling (Mini Project)                                                               | 06        |
| 9            | Programs using preprocessor directives, macros, header files, and conditional compilation.                                       | 04        |
| 10           | Programs using modular programming concepts and mini applications following programming best practices and debugging techniques. | 04        |
| <b>TOTAL</b> |                                                                                                                                  | <b>60</b> |

#### COURSE EVALUATION & ASSESSMENT RUBRICS:

| Component | CE/ESE | Evaluation Methodology / Rubrics                                                                                                     | Marks | Passing Marks |
|-----------|--------|--------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| Theory    | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks. | 30    | 00            |
|           | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                              | 50    | 20            |
| Practical | CE     | Performance of practical which should be evaluated out of 10 marks for each practical and average of the                             | 30    | 00            |

|                    |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |           |
|--------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
|                    |     | same will be converted to 30 marks.                                                                                                                                                                                                                                                                                                                                                                                                                  |            |           |
|                    | ESE | Quiz / Practical Performance – 25Marks<br>External Viva Voce – 25 Marks                                                                                                                                                                                                                                                                                                                                                                              | 50         | 20        |
| Assignment         | CE  | <ul style="list-style-type: none"> <li>Students shall complete 4 programming assignments during the semester. Each assignment will be evaluated based on: <ul style="list-style-type: none"> <li>• Problem Understanding &amp; Algorithm Design – 5 Marks</li> <li>• Program Logic &amp; Correctness – 5 Marks</li> <li>• Code Quality &amp; Documentation – 15 Marks</li> <li>• Execution, Output &amp; Viva Voce – 15 Marks</li> </ul> </li> </ul> | 40         | 00        |
| <b>TOTAL MARKS</b> |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>200</b> | <b>80</b> |

### TEXT BOOK(S):

| Title                     | Author/s           | Publication      |
|---------------------------|--------------------|------------------|
| Let Us C (Latest Edition) | Yashavant Kanetkar | BPB Publications |

### REFERENCE BOOK(S):

| Title                      | Author/s                               | Publication |
|----------------------------|----------------------------------------|-------------|
| Programming in ANSI C      | E. Balagurusamy                        | McGraw Hill |
| The C Programming Language | Brian W. Kernighan & Dennis M. Ritchie | Pearson     |
| C: How to Program          | Paul Deitel & Harvey Deitel            | Pearson     |

### COURSE OUTCOME(S):

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

| ICACS1010 | Programming Fundamentals with C                                                                                                  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|
| CO 1      | Explain the fundamentals of programming, algorithms, flowcharts, and C language syntax for solving computational problems.       |
| CO 2      | Develop C programs using operators, decision-making statements, loops, functions, and arrays to solve engineering problems.      |
| CO 3      | Apply pointers, strings, dynamic memory allocation, and user-defined functions to design efficient C programs.                   |
| CO 4      | Implement programs using structures, unions, file handling, and modular programming techniques for data processing applications. |
| CO 5      | Analyse structured C programs by applying good programming practices and problem-solving skills.                                 |

### MAPPING OF CO WITH PO:

| ICACS1010 | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 2   | 1   | 0   | 1   | 0   | 0   | 1   |
| CO 2      | 2   | 3   | 2   | 0   | 2   | 0   | 0   | 1   |
| CO 3      | 2   | 3   | 3   | 1   | 2   | 1   | 0   | 1   |
| CO 4      | 2   | 2   | 3   | 2   | 2   | 1   | 1   | 1   |

|      |   |   |   |   |   |   |   |   |
|------|---|---|---|---|---|---|---|---|
| CO 5 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 |
|------|---|---|---|---|---|---|---|---|

**MAPPING OF CO WITH PSO:**

| ICACS1010 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 3    | 1    | 0    |
| CO 2      | 3    | 2    | 0    |
| CO 3      | 2    | 3    | 1    |
| CO 4      | 2    | 3    | 2    |
| CO 5      | 2    | 3    | 3    |

**LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT**

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                            | RBT Level |
|-----------|----------------------------------------------------|-----------|
| 1         | Introduction to Programming and C Fundamentals     | 1,2       |
| 2         | Decision Making and Looping                        | 2, 3      |
| 3         | Functions and Arrays                               | 2,3       |
| 4         | Pointers and Dynamic Memory Allocation             | 3, 4      |
| 5         | Structures, Unions and File Handling               | 2,3,4     |
| 6         | Preprocessor, Modular Programming and Applications | 5,6       |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Computer Science**

**COURSE DETAILS:**

|                       |                    |
|-----------------------|--------------------|
| Course Code           | ICACS1030          |
| Course Name           | Prompt Engineering |
| Prerequisite Course/s | None               |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 04     | 120                  | 30                   | 30        | 00       | 00                     | 00 | 00         | 30        | 30            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 30        | 50  | 00       | 00  | 00      | 00  | 00 | 00  | 00         | 00  | 20        | 00  | 20            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Understand the fundamentals of Large Language Models (LLMs) and the role of prompts in steering their behaviour.
- Develop the ability to design, structure, and refine prompts for accurate, relevant, and reliable AI outputs.
- Explore prompting techniques such as zero-shot, few-shot, chain-of-thought, and role-based prompting across different AI platforms
- Apply prompt engineering practices to real-world tasks including content generation, coding assistance, data analysis, and research.
- Evaluate, debug, and ethically apply prompt engineering strategies for academic, professional, and creative use cases.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                                                                                                                                                                                                       | Hours | Weightage in% |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Introduction to Prompt Engineering:</b><br>Concept of prompts and prompt engineering; role of prompts in Large Language Models (LLMs); evolution from rule-based NLP to generative AI; overview of GPT, Gemini, Claude and other LLM architectures; anatomy of a prompt (instruction, context, input data, output indicator); applications of prompt engineering in industry and academia. | 05    | 17            |

|              |                                                                                                                                                                                                                                                                                                                             |           |             |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
| 2            | <b>Core Prompting Techniques:</b><br>Zero-shot, one-shot, and few-shot prompting; chain-of-thought and step-by-step reasoning prompts; role-based and persona prompting; instruction-based and template-based prompting; iterative prompt refinement; prompt formatting using delimiters, XML tags, and structured outputs. | 05        | 17          |
| 3            | <b>Advanced Prompting Strategies I:</b><br>Self-consistency and tree-of-thought prompting; retrieval-augmented generation (RAG) basics; system prompts versus user prompts.                                                                                                                                                 | 05        | 16          |
| 4            | <b>Advanced Prompting Strategies II:</b><br>Function calling and tool-use prompts; multi-turn conversation design; prompt chaining for complex, multi-step tasks.                                                                                                                                                           | 05        | 17          |
| 5            | <b>Domain-Specific Prompt Applications: :</b><br>Prompt engineering for content writing and summarisation; prompts for coding assistance and debugging; prompts for data analysis and visualisation; prompts for image and video generation tools; prompts for research, academic writing, and presentations.               | 05        | 16          |
| 6            | <b>Evaluation, Ethics &amp; Responsible Prompting:</b><br>Evaluating prompt quality and output reliability; identifying and reducing hallucination and bias; prompt injection and security concerns; data privacy in prompt design; responsible and ethical use of AI tools; documentation and version control of prompts.  | 05        | 17          |
| <b>TOTAL</b> |                                                                                                                                                                                                                                                                                                                             | <b>30</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No       | Practical / Tutorial                                                                                                | Hours     |
|--------------|---------------------------------------------------------------------------------------------------------------------|-----------|
| 1            | Introduction to LLM platforms (ChatGPT, Gemini, Claude) and exploring their prompt interfaces.                      | 03        |
| 2            | Anatomy of a prompt: instruction, context, input data, and output indicator identifying and rewriting weak prompts. | 03        |
| 3            | Designing zero-shot prompts for text classification and summarisation tasks                                         | 03        |
| 4            | Building chain-of-thought prompts for solving multi-step mathematical and logical reasoning problems.               | 03        |
| 5            | Prompt engineering for coding assistance — code generation and explanation.                                         | 03        |
| 6            | Designing structured prompts using delimiters and XML tags for consistent, parseable outputs.                       | 03        |
| 7            | Prompt chaining and multi-turn conversation design for a multi-step task (e.g., research summary to presentation).  | 03        |
| 8            | Image/content generation prompting using AI tools (DALL-E, Midjourney, Adobe Firefly) and prompt refinement.        | 03        |
| 9            | Function calling and tool-use prompts; designing system prompts versus user prompts.                                | 03        |
| 10           | Mini Project: Building and documenting a prompt library for a chosen real-world use case.                           | 03        |
| <b>TOTAL</b> |                                                                                                                     | <b>30</b> |

### SELF-LEARNING ONLINE RESOURCES:

| Sr. No | Link / Description                                                                                                                                                                 | Self-Learning Hours |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1      | <a href="https://www.youtube.com/watch?v=YhRfgYH_AoU&amp;t=17s">https://www.youtube.com/watch?v=YhRfgYH_AoU&amp;t=17s</a> P- Prompt Engineering Full Course   From Beginner to Pro | 05                  |
| 2      | <a href="https://www.youtube.com/watch?v=dOxUroR57xs">https://www.youtube.com/watch?v=dOxUroR57xs</a> – ChatGPT Prompt Engineering for Developers (DeepLearning.AI)                | 05                  |
| 3      | <a href="https://www.promptingguide.ai/">https://www.promptingguide.ai/</a> – Prompt Engineering Guide (techniques and case studies)                                               | 05                  |
| 4      | <a href="https://www.youtube.com/watch?v=_ZvnD73m40o">https://www.youtube.com/watch?v=_ZvnD73m40o</a> – Prompt Engineering Tutorial for Beginners                                  | 05                  |
| 5      | <a href="https://www.youtube.com/watch?v=suewaPnOdQI">https://www.youtube.com/watch?v=suewaPnOdQI</a> - Prompt Engineering Beginner COMPLETE Guide and for PROS (2025)             | 05                  |
| 6      | <a href="https://www.youtube.com/watch?v=DKUIRZ3hh-o&amp;t=10s">https://www.youtube.com/watch?v=DKUIRZ3hh-o&amp;t=10s</a> - Become a Prompt Engineering EXPERT in Just 1 hour      | 05                  |

### COURSE EVALUATION & ASSESSMENT RUBRICS:

| Component          | CE/ESE | Evaluation Methodology / Rubrics                                                                                                             | Marks      | Passing Marks |
|--------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Theory             | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks.         | 30         | 00            |
|                    | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                      | 50         | 20            |
| Practical          | CE     | Performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks. | 30         | 00            |
|                    | ESE    | Quiz / Practical Performance – 25Marks<br>External Viva Voce – 25 Marks                                                                      | 50         | 20            |
| Term Work          | CE     | Prompt Portfolio to solve a concrete, real-world problem using the advanced prompting methodologies                                          | 20         | 00            |
| Self Learning      | CE     | 40 MCQ questions based on self-study resources and online learning   0.5 marks per question   Total = 20 marks                               | 20         | 00            |
| <b>TOTAL MARKS</b> |        |                                                                                                                                              | <b>200</b> | <b>80</b>     |

### TEXT BOOK(S):

| Title                                | Author/s                    | Publication    |
|--------------------------------------|-----------------------------|----------------|
| Prompt Engineering for Generative AI | James Phoenix & Mike Taylor | O'Reilly Media |

### REFERENCE BOOK(S):

| Title                                      | Author/s       | Publication      |
|--------------------------------------------|----------------|------------------|
| The Art of Prompt Engineering with ChatGPT | Mark McQuillan | Packt Publishing |

|                          |              |                |
|--------------------------|--------------|----------------|
| Generative Deep Learning | David Foster | O'Reilly Media |
|--------------------------|--------------|----------------|

### COURSE OUTCOME(S):

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

| ICACS1030 | Prompt Engineering                                                                                                             |
|-----------|--------------------------------------------------------------------------------------------------------------------------------|
| CO 1      | Explain the fundamentals of Large Language Models, prompt anatomy, and the significance of prompt engineering in generative AI |
| CO 2      | Apply zero-shot, few-shot, chain-of-thought, and role-based prompting techniques to solve academic and professional tasks.     |
| CO 3      | Design advanced prompts using chaining, system/user prompt separation, and retrieval-augmented strategies for complex tasks.   |
| CO 4      | Use domain-specific prompting for content generation, coding assistance, data analysis, and creative AI tools.                 |
| CO 5      | Evaluate prompt outputs for reliability and bias, and apply ethical and responsible practices in prompt design.                |

### MAPPING OF CO WITH PO:

| ICACS1030 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 1   | 0   | 0   | 2   | 0   | 0   | 1   |
| CO 2      | 2   | 3   | 1   | 2   | 3   | 2   | 0   | 2   |
| CO 3      | 2   | 3   | 3   | 2   | 3   | 2   | 0   | 2   |
| CO 4      | 1   | 2   | 2   | 1   | 3   | 3   | 0   | 2   |
| CO 5      | 0   | 2   | 0   | 2   | 2   | 0   | 3   | 2   |

### MAPPING OF CO WITH PSO:

| ICACS1030 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 2    | 1    | 2    |
| CO 2      | 3    | 2    | 2    |
| CO 3      | 2    | 2    | 3    |
| CO 4      | 2    | 3    | 2    |
| CO 5      | 1    | 2    | 3    |

### LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                    | RBT Level |
|-----------|--------------------------------------------|-----------|
| 1         | Introduction to Prompt Engineering         | 1,2       |
| 2         | Core Prompting Techniques                  | 3         |
| 3         | Advanced Prompting Strategies-I            | 3,4       |
| 4         | Advanced Prompting Strategies-II           | 3,4       |
| 5         | Domain-Specific Prompt Applications        | 5         |
| 6         | Evaluation, Ethics & Responsible Prompting | 5         |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Science and Humanities**

**COURSE DETAILS:**

|                       |                    |
|-----------------------|--------------------|
| Course Code           | ICASH1020          |
| Course Name           | Applied Statistics |
| Prerequisite Course/s | None               |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |     |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|-----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | PPT | Assignment | Term Work | Self-Learning |
| 04     | 120                  | 45                   | 00        | 30       | 00                     | 00  | 30         | 00        | 15            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | PPT |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|-----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE  | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 00        | 00  | 30       | 50  | 00      | 00  | 00  | 00  | 20         | 00  | 00        | 00  | 20            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Understand the fundamentals of data, statistical measures, and methods for data summarization and visualization.
- Analyze datasets using descriptive statistics, exploratory data analysis, and correlation techniques.
- Apply probability concepts and probability distributions to model uncertainty and solve real-world problems.
- Develop the ability to perform statistical inference through sampling and hypothesis testing techniques.
- Interpret and apply statistical methods for data-driven decision-making in computing and related domains.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Hours | Weightage in% |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Introduction to Data &amp; Descriptive Statistics:</b><br>Elements, Variables, and Observations, Scales of Measurement, Categorical and Quantitative Data, Cross-Sectional and Time Series Data, Summarizing Categorical Data and Quantitative Data, Frequency Distribution, Relative Frequency and Percentage Distributions, Bar Charts and Pie Charts, Dot Plot, Histogram, Cumulative Distributions, Ogive, Measures of Location: Mean, Median, Mode, Percentiles and | 10    | 25            |

|              |                                                                                                                                                                                                                                                                                         |           |             |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
|              | Quartiles, Measures of Variability: Range, Interquartile Range, Variance, Standard Deviation, Coefficient of Variation.                                                                                                                                                                 |           |             |
| 2            | <b>Exploratory Data Analysis:</b><br>Distribution Shape, Scores, Chebyshev's Theorem, Empirical Rule, Outliers, Five Number Summary, Box Plot.                                                                                                                                          | 07        | 15          |
| 3            | <b>Correlation Analysis:</b><br>Type and properties of Correlation, Karl-Pearson's coefficient.                                                                                                                                                                                         | 05        | 10          |
| 4            | <b>Introduction to Probability:</b><br>Experiments, Counting Rules, Assigning Probabilities, Events and their Probabilities, Relationships of Probabilities, Conditional Probability, Bayes' Theorem                                                                                    | 06        | 10          |
| 5            | <b>Discrete and Continuous Probability Distribution:</b><br>Random Variables, Discrete Probability Distributions, Expected Values and variance, Binomial Probability Distribution, Poisson Probability Distribution, Uniform Probability Distribution, Normal Probability Distribution. | 10        | 25          |
| 6            | <b>Testing of Hypothesis:</b><br>Introduction, Sampling, Tests of Significance, Null Hypothesis, Alternative Hypothesis, Type 1 and Type 2 errors, Level of Significance, Chi-square test, Student's t-test, Seducer's F-test.                                                          | 07        | 15          |
| <b>TOTAL</b> |                                                                                                                                                                                                                                                                                         | <b>45</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No       | Practical / Tutorial                                | Hours     |
|--------------|-----------------------------------------------------|-----------|
| 1            | Introduction to various statistical tools.          | 02        |
| 2            | Implementation of Data & Descriptive Statistics-1.  | 02        |
| 3            | Implementation of Data & Descriptive Statistics-2.  | 02        |
| 4            | Implementation of Data & Descriptive Statistics-3.  | 02        |
| 5            | Implementation & Exploratory Data Analysis.         | 02        |
| 6            | Correlation Analysis                                | 04        |
| 7            | Introduction to Probability                         | 02        |
| 8            | Discrete and Continuous Probability Distribution-1. | 04        |
| 9            | Discrete and Continuous Probability Distribution-2. | 04        |
| 10           | Testing of Hypothesis                               | 06        |
| <b>TOTAL</b> |                                                     | <b>30</b> |

#### SELF-LEARNING ONLINE RESOURCES:

| Sr. No | Link / Description                                                                                                                                                                                                                                                                                                                                      | Self-Learning Hours |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1      | <a href="https://www.youtube.com/watch?v=wI9PKnQkusQ">https://www.youtube.com/watch?v=wI9PKnQkusQ</a><br>An Introduction to Statistics... a practical, psychology-focused intro to statistics displaying data, focused on categorical variables.                                                                                                        | 05                  |
| 2      | <a href="https://www.youtube.com/watch?v=-iYycoUGfuE">https://www.youtube.com/watch?v=-iYycoUGfuE</a><br>Why probability matters and its uses, Sample Space & Events: defining outcomes and events, Discrete vs Continuous Probability: understanding different types of events<br>Conditional Probability: updating probabilities with new information | 05                  |

|   |                                                                                                                                                    |    |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 3 | <a href="https://www.youtube.com/watch?v=ruWsWnik7YY">https://www.youtube.com/watch?v=ruWsWnik7YY</a><br>Probability Distribution, Random Variable | 05 |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------|----|

### COURSE EVALUATION & ASSESSMENT RUBRICS:

| Component          | CE/ESE | Evaluation Methodology / Rubrics                                                                                                            | Marks      | Passing Marks |
|--------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Theory             | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks.        | 30         | 00            |
|                    | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                     | 50         | 20            |
| Practical          | CE     | Performance of tutorial which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks. | 30         | 00            |
|                    | ESE    | Quiz – 25Marks<br>External Viva Voce – 25 Marks                                                                                             | 50         | 20            |
| Assignment         | CE     | A single assignment comprising 30 questions covers all six modules.                                                                         | 20         | 00            |
| Self Learning      | CE     | 20 MCQ questions based on self-study resources and online learning   1 marks per question   Total = 20 marks                                | 20         | 00            |
| <b>TOTAL MARKS</b> |        |                                                                                                                                             | <b>200</b> | <b>80</b>     |

### TEXT BOOK(S):

| Title            | Author/s    | Publication           |
|------------------|-------------|-----------------------|
| Basic Statistics | B L AGRAWAL | New Age International |

### REFERENCE BOOK(S):

| Title                                          | Author/s                                      | Publication              |
|------------------------------------------------|-----------------------------------------------|--------------------------|
| Understandable Statistics Concepts and Methods | Charles Henry Brase<br>Corrinne PellilloBrase | Houghton Mifflin Company |

### COURSE OUTCOME(S):

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

| ICASH1020 | Applied Statistics                                                                                                                                            |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO 1      | Elaborate analysis of categorial data and quantitative data.                                                                                                  |
| CO 2      | Examine the box plot for real data and able to find the outliers.                                                                                             |
| CO 3      | Adapt the knowledge of various probability distribution and their applications in mathematical models, sport strategies and insurance.                        |
| CO 4      | Analyze the relationship between variables using correlation techniques and interpret Karl Pearson's correlation coefficient for data-driven decision-making. |
| CO 5      | Apply hypothesis testing techniques, including Chi-square, t-test, and F-test, for statistical data analysis and decision-making.                             |

**MAPPING OF CO WITH PO:**

| ICASH1020 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 3   | 1   | 2   | 0   | 0   | 0   | 1   |
| CO 2      | 3   | 2   | 1   | 2   | 0   | 0   | 0   | 1   |
| CO 3      | 3   | 2   | 1   | 2   | 0   | 0   | 0   | 1   |
| CO 4      | 3   | 2   | 1   | 2   | 0   | 0   | 0   | 1   |
| CO 5      | 2   | 2   | 1   | 2   | 0   | 0   | 0   | 1   |

**MAPPING OF CO WITH PSO:**

| ICASH1020 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 2    | 2    | 1    |
| CO 2      | 1    | 1    | 1    |
| CO 3      | 2    | 1    | 1    |
| CO 4      | 1    | 2    | 1    |
| CO 5      | 2    | 2    | 1    |

**LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT**

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                        | RBT Level |
|-----------|------------------------------------------------|-----------|
| 1         | Introduction to Data & Descriptive Statistics  | 1,2,3,5   |
| 2         | Exploratory Data Analysis                      | 1,2,3,4   |
| 3         | Correlation Analysis                           | 2,3,4,5   |
| 4         | Introduction to Probability                    | 2,3,5     |
| 5         | Discrete & Continuous Probability Distribution | 1,2,3,4   |
| 6         | Testing of Hypothesis                          | 1,2,3,4   |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Information Technology**

**COURSE DETAILS:**

|                       |                                   |
|-----------------------|-----------------------------------|
| Course Code           | ICAIT1020                         |
| Course Name           | Introduction to Database Concepts |
| Prerequisite Course/s | None                              |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 04     | 120                  | 45                   | 30        | 00       | 00                     | 00 | 25         | 20        | 00            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 30        | 50  | 00       | 00  | 00      | 00  | 00 | 00  | 20         | 00  | 20        | 00  | 00            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- To understand the fundamental concepts of database management systems, data models, and the relational model, and to differentiate them from traditional file organization systems.
- To familiarize students with relational database concepts, including keys, integrity constraints, and various query languages (DDL, DML, TCL) for database manipulation.
- To develop proficiency in writing SQL queries, ranging from basic SELECT operations to advanced techniques involving sub-queries, joins, and views.
- To enable students to design conceptual database schemas using Entity-Relationship (E-R) modelling techniques, including extended E-R features like generalization, specialization, and aggregation.
- To equip students with the knowledge of functional dependencies and normalization techniques (1NF, 2NF, 3NF, BCNF) to design efficient, anomaly-free database schemas.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                                                                                       | Hours | Weightage in% |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Introduction to DBMS and Data Models: :</b><br>File Organization vs. DBMS, Purpose & Application of DBMS, Data Independence, Architecture, Users & Administrators. Data Models. Relational Model: Structure, Domains, Relations, Relational Algebra (Operators & Queries). | 07    | 16            |
| 2          | <b>Relational Database Concepts and Integrity:</b>                                                                                                                                                                                                                            | 08    | 18            |

|              |                                                                                                                                                                                                                                                               |           |             |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
|              | Components of DBMS, Query Languages (DDL, DML, TCL), Data Independence, Keys (Super, Candidate, Primary, Foreign, etc.), Integrity Constraints (Domain, Referential, Entity).                                                                                 |           |             |
| 3            | <b>SQL Query Fundamentals and Functions:</b><br>Basic SELECT, WHERE, ORDER BY, IN operator, Aggregate functions, Built-in functions (numeric, date, string). Set operations. INSERT, UPDATE & DELETE queries.                                                 | 08        | 16          |
| 4            | <b>Advanced SQL:</b><br>Sub-queries and Correlated Sub-queries. Joins (Inner, Outer, Self), Exist, Any, All. Views and its types.                                                                                                                             | 07        | 16          |
| 5            | <b>Entity-Relationship (E-R) Modelling:</b><br>E-R Model: Basic concepts, Design process, Constraints, Keys, Design issues, E-R diagrams, Weak Entity Sets. Extended E-R Features: Generalization, Specialization, Aggregation, Reduction to Database Schema. | 07        | 16          |
| 6            | <b>Normalization:</b><br>Functional Dependency & its types, Consequences of Bad Design (Anomalies), Normalization Need. Normal Forms: First (1NF), Second (2NF), Third (3NF), BCNF.                                                                           | 08        | 18          |
| <b>TOTAL</b> |                                                                                                                                                                                                                                                               | <b>45</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No       | Practical / Tutorial                                                                             | Hours     |
|--------------|--------------------------------------------------------------------------------------------------|-----------|
| 1            | Create and manage databases using DDL commands (CREATE, ALTER, DROP) and explore data types.     | 04        |
| 2            | Execute DML operations using INSERT, UPDATE, DELETE with realistic sample tables.                | 02        |
| 3            | Implement integrity constraints including primary key, foreign key, unique, check, and not null. | 04        |
| 4            | Implement basic SQL queries using SELECT, WHERE, ORDER BY, BETWEEN, LIKE, IN.                    | 04        |
| 5            | Apply aggregate and built-in functions (COUNT, SUM, AVG, MIN, MAX, string, date functions).      | 02        |
| 6            | Implement SQL queries using GROUP BY & HAVING clauses                                            | 02        |
| 7            | Perform set operations such as UNION, INTERSECT, and MINUS on sample datasets.                   | 02        |
| 8            | Write SQL queries using different types of JOINS (Inner, Left, Right, Full, Self Join).          | 04        |
| 9            | Implement subqueries and correlated subqueries for complex data retrieval.                       | 04        |
| 10           | Create and manage views (simple view, complex view, updatable/non-updatable views).              | 02        |
| <b>TOTAL</b> |                                                                                                  | <b>30</b> |

#### COURSE EVALUATION & ASSESSMENT RUBRICS:

| Component | CE/ESE | Evaluation Methodology / Rubrics                                                                                                     | Marks | Passing Marks |
|-----------|--------|--------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| Theory    | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks. | 30    | 00            |

|                    |     |                                                                                                                                                                                                                                                                                              |            |           |
|--------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
|                    | ESE | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                                                                                                                                                                      | 50         | 20        |
| Practical          | CE  | Performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks.                                                                                                                                                 | 30         | 00        |
|                    | ESE | Quiz / Practical Performance – 25Marks<br>External Viva Voce – 25 Marks                                                                                                                                                                                                                      | 50         | 20        |
| Assignment         | CE  | <ul style="list-style-type: none"> <li>Assessment based on identification of functional dependencies, determination of candidate keys, and normalization of relations. Evaluation: FD Analysis &amp; Candidate Keys (5), Normalization (8), Documentation &amp; Presentation (7).</li> </ul> | 20         | 00        |
| Term Work          | CE  | Assessment based on development of an ER model for a given problem domain. Evaluation: Entities & Attributes (5), Relationships & Constraints (5), Design Accuracy (5), Presentation & Documentation (5).                                                                                    | 20         | 00        |
| <b>TOTAL MARKS</b> |     |                                                                                                                                                                                                                                                                                              | <b>200</b> | <b>80</b> |

#### TEXT BOOK(S):

| Title                   | Author/s                                                 | Publication |
|-------------------------|----------------------------------------------------------|-------------|
| Database System Concept | Abraham Silberschatz,<br>Henry F. Korth, S.<br>Sudarshan | McGraw Hill |

#### REFERENCE BOOK(S):

| Title                                     | Author/s                   | Publication      |
|-------------------------------------------|----------------------------|------------------|
| PL/SQL-The Programming Language of Oracle | Ivan Bayross               | BPB Publications |
| An Introduction to Database System        | CJ Date                    | Addison-Wesley   |
| Fundamental of Database System            | R. Elmasri and S.B Navathe | Benjamin/Cumming |
| Oracle: The Complete Reference            | George Koch, Kevin Loney   | TMH/oracle press |

#### COURSE OUTCOME(S):

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

| ICAIT1020 | Introduction to Database Concepts                                                                                          |
|-----------|----------------------------------------------------------------------------------------------------------------------------|
| CO 1      | Understand fundamental DBMS concepts, data models, architectures, and relational algebra operations.                       |
| CO 2      | Apply relational database concepts, keys, and integrity constraints to design consistent database structures.              |
| CO 3      | Construct SQL queries using basic, advanced, and functional operations for data retrieval and manipulation.                |
| CO 4      | Design Entity-Relationship models for real-world application domains and convert them into relational schemas.             |
| CO 5      | Apply functional dependencies and normalization techniques to design efficient and consistent relational database schemas. |

**MAPPING OF CO WITH PO:**

| ICAIT1020 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 2   | 0   | 0   | 0   | 0   | 0   | 1   |
| CO 2      | 3   | 3   | 1   | 0   | 0   | 0   | 0   | 1   |
| CO 3      | 2   | 3   | 0   | 2   | 2   | 0   | 0   | 2   |
| CO 4      | 2   | 3   | 1   | 2   | 2   | 2   | 1   | 2   |
| CO 5      | 3   | 3   | 2   | 2   | 0   | 2   | 2   | 2   |

**MAPPING OF CO WITH PSO:**

| ICAIT1020 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 1    | 0    | 0    |
| CO 2      | 2    | 0    | 1    |
| CO 3      | 2    | 0    | 2    |
| CO 4      | 3    | 2    | 2    |
| CO 5      | 3    | 2    | 2    |

**LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT**

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                    | RBT Level |
|-----------|--------------------------------------------|-----------|
| 1         | Introduction to DBMS and Data Models       | 1,2       |
| 2         | Relational Database Concepts and Integrity | 1,2,3     |
| 3         | SQL Query Fundamentals and Functions       | 2,3,4     |
| 4         | Advanced SQL                               | 4,5       |
| 5         | Entity-Relationship (E-R) Modelling        | 2,3,4     |
| 6         | Normalization                              | 2,3,4     |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Computer Application**

**COURSE DETAILS:**

|                       |                         |
|-----------------------|-------------------------|
| Course Code           | ICACA1010               |
| Course Name           | Basics of Web Designing |
| Prerequisite Course/s | None                    |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 04     | 120                  | 30                   | 45        | 00       | 30                     | 00 | 00         | 00        | 15            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 30        | 50  | 00       | 00  | 20      | 00  | 00 | 00  | 00         | 00  | 00        | 00  | 20            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Understand the core concepts of UI/UX design and standard web terminologies.
- Build structured and semantic web pages using HTML5.
- Apply modern styling, layouts, and responsive design properties using CSS3.
- Create fully responsive, mobile-first web applications using Bootstrap frameworks.
- Introduce client-side scripting logic using JavaScript (ES6) for web interactivity.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                                                                                                                     | Hours | Weightage in% |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Basics of User Interface &amp; Web Fundamentals:</b><br>User Interface: Importance, benefits, and design principles. Human-computer interaction basics. Web terminologies: Web Browser, Web Server, Domain Name, URL, IP Address, Website vs. Web App. Intro to Web Hosting & Cloud deployment concepts. | 05    | 15            |
| 2          | <b>Core Markup Language (HTML5):</b><br>Structure of HTML: Elements, Tags, and Attributes. Core Elements: Root, Metadata, Headings, Paragraphs, Links, Formatting tags, Lists, and HTML Tables. Forms: Form attributes, Types of input elements, and modern validation techniques.                          | 06    | 20            |
| 3          | <b>Advanced HTML5 Features:</b>                                                                                                                                                                                                                                                                             | 04    | 15            |

|              |                                                                                                                                                                                                                                                                                                                                          |           |             |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
|              | Semantic elements (Header, Footer, Section, Article, Nav, Aside). Multimedia integration: Audio, Video, and Canvas elements. Modern file paths, Favicons, and Embedding external components(iFrames).                                                                                                                                    |           |             |
| 4            | <b>Applying Styles (CSS3) &amp; Layouts:</b><br>Syntax, Structure, and CSS implementation (Inline, Internal, External). Selectors: Element, Class, ID, Pseudo-classes, and Universal selectors. Core Properties: Box Model (Margin, Border, Padding, Content), Typography, Backgrounds. Modern Layouts: Flexbox and CSS Grid.            | 06        | 20          |
| 5            | <b>Modern UI Frameworks (Bootstrap):</b><br>Introduction to responsive web design and Media Queries. Integrating Bootstrap via CDN. Understanding the Grid System (Containers, Rows, Columns). Utilizing utility classes and responsive components (Navbar, Cards, Buttons, Modals).                                                     | 04        | 15          |
| 6            | <b>Client-Side Scripting with JavaScript:</b><br>Introduction to Client-side vs Server-side scripting. Embedding JavaScript into HTML. Core Essentials: Variables (let, const), Data types, Operators, Conditional statements, and Loops. Functions: Declaration, Arrow functions, and Basic Event Handling (Keyboard and Mouse events). | 05        | 15          |
| <b>TOTAL</b> |                                                                                                                                                                                                                                                                                                                                          | <b>30</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No       | Practical / Tutorial                                                                                                             | Hours     |
|--------------|----------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1            | Practice core HTML tags: Headings, Paragraphs, Lists, and Text Formatting.                                                       | 04        |
| 2            | Create structured data representations using HTML Tables and complex Forms with validation.                                      | 04        |
| 3            | Embed multimedia components (Images, Audio, Video) and link pages seamlessly.                                                    | 04        |
| 4            | Style a web page using CSS selectors, custom typography, backgrounds, and the Box Model.                                         | 04        |
| 5            | Design a structural modern layout using CSS Flexbox and CSS Grid rules.                                                          | 05        |
| 6            | Apply standard CSS responsive design rules using custom Media Queries.                                                           | 04        |
| 7            | Develop a clean, professional, fully responsive website utilizing the Bootstrap 5 UI framework.                                  | 06        |
| 8            | Implement introductory JavaScript to perform basic arithmetic operations and handle browser alerts.                              | 04        |
| 9            | Build a functional interactive Form that validates data using JavaScript prior to submission.                                    | 05        |
| 10           | Mini Project Execution: Build a 3-page responsive personal portfolio/business landing page using HTML5, CSS3, JS, and Bootstrap. | 05        |
| <b>TOTAL</b> |                                                                                                                                  | <b>45</b> |

#### SELF-LEARNING ONLINE RESOURCES:

| Sr. No | Link / Description | Self-Learning Hours |
|--------|--------------------|---------------------|
|--------|--------------------|---------------------|

|   |                                                                                                                                                                            |    |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 1 | <a href="https://www.coursera.org">https://www.coursera.org</a> – Introduction to HTML, CSS, & JavaScript, IBM                                                             | 03 |
| 2 | <a href="https://www.coursera.org">https://www.coursera.org</a> – Web Design for Everybody: Basics of Web Development, University of Michigan                              | 03 |
| 3 | <a href="https://www.w3schools.com">https://www.w3schools.com</a> – HTML, CSS and JS                                                                                       | 03 |
| 4 | <a href="https://swayam.gov.in/explorer">https://swayam.gov.in/explorer</a> - HTML, SWAYAM NPTEL MOOCs                                                                     | 03 |
| 5 | <a href="https://swayam-plus.swayam2.ac.in/courses/course-details?id=F_INFOSY_03">https://swayam-plus.swayam2.ac.in/courses/course-details?id=F_INFOSY_03</a> - JavaScript | 03 |

### COURSE EVALUATION & ASSESSMENT RUBRICS:

| Component          | CE/ESE | Evaluation Methodology / Rubrics                                                                                                                                         | Marks      | Passing Marks |
|--------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Theory             | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks.                                     | 30         | 00            |
|                    | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                                                  | 50         | 20            |
| Practical          | CE     | Performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks.                             | 30         | 00            |
|                    | ESE    | Quiz / Practical Performance – 25Marks<br>External Viva Voce – 25 Marks                                                                                                  | 50         | 20            |
| Project            | CE     | Project Evaluation Rubrics<br>UI/UX Layout Quality – 5 Marks<br>Code Structure & Semantics – 5 Marks<br>Responsiveness – 5 Marks<br>Functionality & Code logic – 5 Marks | 20         | 00            |
| Self Learning      | CE     | 40 MCQ questions based on self-study resources and online learning   0.5 marks per question   Total = 20 marks                                                           | 20         | 00            |
| <b>TOTAL MARKS</b> |        |                                                                                                                                                                          | <b>200</b> | <b>80</b>     |

### TEXT BOOK(S):

| Title                        | Author/s                       | Publication     |
|------------------------------|--------------------------------|-----------------|
| Black Book, Web Technologies | Kogent Learning Solutions Inc. | Dreamtech Press |

### REFERENCE BOOK(S):

| Title                       | Author/s                         | Publication     |
|-----------------------------|----------------------------------|-----------------|
| Black Book, HTML 5          | DT Editorial Services            | Dreamtech Press |
| Developing Web Applications | Ralph Moseley and M. T. Savaliya | Wiley-India     |

### COURSE OUTCOME(S):

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

| ICACA1010 | Basics of Web Designing                                                             |
|-----------|-------------------------------------------------------------------------------------|
| CO 1      | Understand core web communication frameworks and general user interface principles. |

|      |                                                                                                             |
|------|-------------------------------------------------------------------------------------------------------------|
| CO 2 | Create semantic, well-formed digital architectures using modern HTML5 tags.                                 |
| CO 3 | Apply comprehensive visual aesthetics and advanced multi-device layouts via CSS3.                           |
| CO 4 | Design fully responsive framework-driven mobile/desktop web platforms utilizing Bootstrap layout standards. |
| CO 5 | Write efficient JavaScript logic to handle client-side operations and active UI interactive elements.       |

#### MAPPING OF CO WITH PO:

| ICACA1010 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 1   | 0   | 0   | 0   | 0   | 1   | 2   |
| CO 2      | 2   | 1   | 2   | 0   | 1   | 0   | 0   | 2   |
| CO 3      | 2   | 2   | 3   | 0   | 2   | 0   | 0   | 2   |
| CO 4      | 2   | 2   | 3   | 1   | 3   | 2   | 1   | 3   |
| CO 5      | 3   | 3   | 3   | 1   | 2   | 1   | 0   | 3   |

#### MAPPING OF CO WITH PSO:

| ICACA1010 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 1    | 2    | 2    |
| CO 2      | 2    | 0    | 1    |
| CO 3      | 3    | 0    | 2    |
| CO 4      | 3    | 1    | 3    |
| CO 5      | 3    | 0    | 3    |

#### LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                     | RBT Level |
|-----------|---------------------------------------------|-----------|
| 1         | Basics of User Interface & Web Fundamentals | 1, 2      |
| 2         | Core Markup Language (HTML5)                | 2, 3      |
| 3         | Advanced HTML5 Features                     | 3, 4      |
| 4         | Applying Styles (CSS3) & Layouts            | 3, 4, 6   |
| 5         | Modern UI Frameworks (Bootstrap)            | 4, 5, 6   |
| 6         | Client-Side Scripting with JavaScript       | 3, 4, 5   |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Computer Science**

**COURSE DETAILS:**

|                       |                                    |
|-----------------------|------------------------------------|
| Course Code           | ICACS1020                          |
| Course Name           | Fundamentals of Python Programming |
| Prerequisite Course/s | None                               |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 04     | 100                  | 30                   | 45        | 00       | 00                     | 00 | 25         | 00        | 00            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 30        | 50  | 00       | 00  | 00      | 00  | 00 | 00  | 20         | 00  | 00        | 00  | 20            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Understand the fundamentals of programming and problem-solving using Python.
- Develop Python programs using decision-making and iterative constructs.
- Apply functions and data structures for developing simple applications.
- Implement object-oriented programming concepts and exception handling mechanisms.
- Develop basic applications involving file handling and introductory Python libraries.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                                  | Hours | Weightage in% |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Introduction to Python Programming:</b><br>Introduction to Programming, Features of Python, Installation and IDE Setup, Python Syntax, Variables, Data Types, Operators, Input and Output Functions, Type Conversion. | 05    | 16            |
| 2          | <b>Decision Making and Iterative Constructs:</b><br>Conditional Statements, Nested Conditions, for Loop, while Loop, break, continue, pass Statements, Pattern-Based Programming                                         | 05    | 17            |
| 3          | <b>Functions and Modular Programming:</b><br>User Defined Functions, Function Arguments, Return Values, Scope of Variables, Recursive Functions, Lambda Functions, Modules and Packages.                                 | 05    | 17            |
| 4          | <b>Strings and Python Data Structures:</b>                                                                                                                                                                               | 05    | 17            |

|   |                                                                                                                                                                        |           |             |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
|   | Strings, Lists, Tuples, Sets, Dictionaries, List Comprehensions, Basic Searching and Sorting Techniques.                                                               |           |             |
| 5 | <b>Object-Oriented Programming and Exception Handling:</b><br>Classes, Objects, Constructors, Inheritance, Polymorphism, Exception Handling, User Defined Exceptions.  | 05        | 17          |
| 6 | <b>File Handling and Introduction to Python Libraries:</b><br>Text Files, CSV Files, Introduction to NumPy, Pandas and Matplotlib, Development of Simple Applications. | 05        | 16          |
|   | <b>TOTAL</b>                                                                                                                                                           | <b>30</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No | Practical / Tutorial                                                            | Hours     |
|--------|---------------------------------------------------------------------------------|-----------|
| 1      | Installation and Configuration of Python Environment and IDE                    | 02        |
| 2      | Programs using Variables, Data Types, Operators, and Expressions                | 02        |
| 3      | Programs for Input/Output Operations and Type Conversion                        | 02        |
| 4      | Programs using Conditional Statements (if, if-else, nested if)                  | 03        |
| 5      | Programs using Looping Constructs (for, while) and Pattern Generation           | 03        |
| 6      | Development of Menu-Driven Applications using Control Structures                | 03        |
| 7      | Programs using User Defined Functions and Recursive Functions                   | 03        |
| 8      | Programs using Lambda Functions, Modules, and Packages                          | 03        |
| 9      | String Processing Applications (Searching, Counting, Validation, Formatting)    | 04        |
| 10     | Programs using Lists, Tuples, Sets, and Dictionaries                            | 03        |
| 11     | Implementation of Searching and Sorting Applications                            | 02        |
| 12     | Design and Development of Applications using Classes and Objects                | 04        |
| 13     | Programs demonstrating Inheritance, Polymorphism, and Exception Handling        | 04        |
| 14     | File Handling Applications using Text and CSV Files                             | 04        |
| 15     | Mini Application Development using Python Libraries (NumPy, Pandas, Matplotlib) | 03        |
|        | <b>TOTAL</b>                                                                    | <b>45</b> |

#### SELF-LEARNING ONLINE RESOURCES:

| Sr. No | Link / Description                                                                                                                                                                                                                                                                                                                                               | Self-Learning Hours |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1      | <a href="https://onlinecourses.nptel.ac.in/noc25_cs56/preview">https://onlinecourses.nptel.ac.in/noc25_cs56/preview</a> - Video lectures covering Python fundamentals, problem-solving, functions, data structures and applications.                                                                                                                             | 04                  |
| 2      | <a href="https://swayam.gov.in/">https://swayam.gov.in/</a> Self-paced video courses on Python programming and computational thinking offered by Indian institutions.                                                                                                                                                                                            | 04                  |
| 3      | <a href="https://www.coursera.org/specializations/python">https://www.coursera.org/specializations/python</a> - Video-based learning on Python programming, data structures, file handling and web applications.                                                                                                                                                 | 04                  |
| 4      | <a href="https://www.edx.org/learn/python/massachusetts-institute-of-technology-introduction-to-computer-science-and-programming-using-python">https://www.edx.org/learn/python/massachusetts-institute-of-technology-introduction-to-computer-science-and-programming-using-python</a> - Introductory video lectures on Python programming and problem solving. | 04                  |
| 5      | <a href="https://learn.microsoft.com/training/browse/?products=python">https://learn.microsoft.com/training/browse/?products=python</a> Guided video modules and hands-on learning resources for Python programming.                                                                                                                                             | 04                  |

**COURSE EVALUATION & ASSESSMENT RUBRICS:**

| Component          | CE/ESE | Evaluation Methodology / Rubrics                                                                                                                                                                                                                | Marks      | Passing Marks |
|--------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Theory             | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks.                                                                                                            | 30         | 00            |
|                    | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                                                                                                                         | 50         | 20            |
| Practical          | CE     | Performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks.                                                                                                    | 30         | 00            |
|                    | ESE    | Quiz / Practical Performance – 25Marks<br>External Viva Voce – 25 Marks                                                                                                                                                                         | 50         | 20            |
| Assignment         | CE     | Each assignment be evaluated out based on problem understanding, algorithm design, code implementation, coding standards, correctness of output, documentation, innovation, and viva/presentation for the Continuous Evaluation (CE) component. | 20         | 00            |
| Self Learning      | CE     | 40 MCQ questions based on self-study resources and online learning   0.5 marks per question   Total = 20 marks                                                                                                                                  | 20         | 00            |
| <b>TOTAL MARKS</b> |        |                                                                                                                                                                                                                                                 | <b>200</b> | <b>80</b>     |

**TEXT BOOK(S):**

| Title                                             | Author/s      | Publication             |
|---------------------------------------------------|---------------|-------------------------|
| Python Programming Using Problem Solving Approach | Reema Thareja | Oxford University Press |

**REFERENCE BOOK(S):**

| Title                   | Author/s             | Publication     |
|-------------------------|----------------------|-----------------|
| Core Python Programming | Dr. R. Nageswara Rao | Dreamtech Press |
| Think Python            | Allen B. Downey      | O'Reilly Media  |

**COURSE OUTCOME(S):**

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

| ICACS1020 | Fundamentals of Python Programming                                                                                       |
|-----------|--------------------------------------------------------------------------------------------------------------------------|
| CO 1      | Explain Python programming fundamentals including syntax, variables, data types, operators, and input/output operations. |
| CO 2      | Develop Python programs using decision-making and iterative control structures to solve computational problems.          |
| CO 3      | Apply functions, strings, lists, tuples, sets, and dictionaries for developing Python applications.                      |
| CO 4      | Design and implement object-oriented programs using classes, objects, inheritance, and exception handling techniques.    |
| CO 5      | Develop Python applications involving file handling and introductory data analysis and                                   |

|  |                          |
|--|--------------------------|
|  | visualization libraries. |
|--|--------------------------|

**MAPPING OF CO WITH PO:**

| ICACS1020 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 2   | 1   | 0   | 1   | 0   | 0   | 2   |
| CO 2      | 3   | 3   | 2   | 1   | 2   | 0   | 1   | 2   |
| CO 3      | 3   | 2   | 3   | 2   | 2   | 1   | 2   | 3   |
| CO 4      | 2   | 3   | 3   | 2   | 3   | 1   | 0   | 2   |
| CO 5      | 2   | 3   | 3   | 3   | 3   | 2   | 2   | 3   |

**MAPPING OF CO WITH PSO:**

| ICACS1020 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 3    | 1    | 0    |
| CO 2      | 3    | 2    | 0    |
| CO 3      | 2    | 3    | 1    |
| CO 4      | 2    | 3    | 2    |
| CO 5      | 2    | 3    | 3    |

**LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT**

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                             | RBT Level |
|-----------|-----------------------------------------------------|-----------|
| 1         | Introduction to Python and Programming Fundamentals | 1,2       |
| 2         | Decision Making and Looping Constructs              | 2,3       |
| 3         | Functions and Modular Programming                   | 3         |
| 4         | Strings and Python Data Structures                  | 3,4       |
| 5         | Object-Oriented Programming and Exception Handling  | 4,5       |
| 6         | File Handling and Introduction to Python Libraries  | 5,6       |

**P P Savani University**  
**School of Engineering**  
**Offered by: Department of Information Technology**

**COURSE DETAILS:**

|                       |                  |
|-----------------------|------------------|
| Course Code           | ICAIT1030        |
| Course Name           | Digital Literacy |
| Prerequisite Course/s | None             |

**TEACHING SCHEME:**

| Credit | Total Learning Hours | Direct Contact Hours |           |          | Indirect Contact Hours |    |            |           |               |
|--------|----------------------|----------------------|-----------|----------|------------------------|----|------------|-----------|---------------|
|        |                      | Theory               | Practical | Tutorial | Project                | CS | Assignment | Term Work | Self-Learning |
| 03     | 90                   | 30                   | 30        | 00       | 00                     | 00 | 30         | 00        | 00            |

GD = Group Discussion | CS = Case Study | FV = Field Visit | PPT = Presentation

**EXAMINATION SCHEME:**

| Theory |     | Practical |     | Tutorial |     | Project |     | CS |     | Assignment |     | Term Work |     | Self-Learning |     | Total |
|--------|-----|-----------|-----|----------|-----|---------|-----|----|-----|------------|-----|-----------|-----|---------------|-----|-------|
| CE     | ESE | CE        | ESE | CE       | ESE | CE      | ESE | CE | ESE | CE         | ESE | CE        | ESE | CE            | ESE |       |
| 30     | 50  | 30        | 50  | 00       | 00  | 00      | 00  | 00 | 00  | 40         | 00  | 00        | 00  | 00            | 00  | 200   |

CE: Continuous Evaluation, ESE: End Semester Exam

**OBJECTIVE OF THE COURSE:**

To help learners to:

- Understand the fundamentals of digital technologies, computing devices, and online services
- Develop proficiency in using productivity software for creating documents, spreadsheets, and presentations
- Utilize internet-based communication, collaboration, and cloud computing tools effectively.
- Practice cyber hygiene, digital ethics, and responsible use of technology
- Apply digital tools and emerging technologies for academic, professional, and personal productivity.

**COURSE CONTENT:**

| Module No. | Content                                                                                                                                                                                                     | Hours | Weightage in% |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| 1          | <b>Introduction to Digital Literacy:</b><br>Digital ecosystem, digital transformation, hardware and software concepts, operating systems, file management, digital skills for education and employment.     | 05    | 16            |
| 2          | <b>Internet and Digital Communication:</b><br>Internet fundamentals, web browsers, search techniques, email communication, video conferencing, digital collaboration tools, online communication etiquette. | 05    | 17            |
| 3          | <b>Digital Documentation and Productivity Tools:</b><br>Word processing, document formatting, tables, templates, mail merge, spreadsheet basics, formulas and functions.                                    | 05    | 17            |

|              |                                                                                                                                                                                          |           |             |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
| 4            | <b>Digital Presentation and Cloud Collaboration:</b><br>Presentation design, multimedia integration, cloud storage, file sharing, collaborative editing, online productivity suites.     | 05        | 17          |
| 5            | <b>Cyber Security and Digital Ethics:</b><br>Cyber threats, malware, phishing, password management, privacy protection, digital footprint, cyber laws, ethical use of technology.        | 05        | 17          |
| 6            | <b>Emerging Digital Technologies:</b><br>Artificial Intelligence, Cloud Computing, Internet of Things (IoT), Digital Payments, E-Governance, Digital Citizenship, Future Digital Skills. | 05        | 16          |
| <b>TOTAL</b> |                                                                                                                                                                                          | <b>30</b> | <b>100%</b> |

#### LIST OF PRACTICAL / TUTORIAL:

| Sr. No       | Practical / Tutorial                                                       | Hours     |
|--------------|----------------------------------------------------------------------------|-----------|
| 1            | Familiarization with Computer System, Operating System and File Management | 02        |
| 2            | File and Folder Operations, Compression and Storage Management             | 02        |
| 3            | Internet Browsing, Search Techniques and Information Retrieval             | 02        |
| 4            | Professional Email Creation and Communication Practices                    | 02        |
| 5            | Document Creation and Formatting using Word Processing Software            | 02        |
| 6            | Working with Tables, Templates and Mail Merge                              | 02        |
| 7            | Spreadsheet Operations and Data Entry Techniques                           | 02        |
| 8            | Spreadsheet Functions, Formulae and Data Analysis                          | 02        |
| 9            | Charts and Graphs using Spreadsheet Software                               | 02        |
| 10           | Creating Professional Presentations with Multimedia Elements               | 02        |
| 11           | Cloud Storage and File Sharing using Google Drive / OneDrive               | 02        |
| 12           | Online Collaboration using Google Workspace / Microsoft 365                | 02        |
| 13           | Digital Payment Systems and E-Governance Services                          | 02        |
| 14           | Cyber Security Awareness and Safe Internet Practices                       | 02        |
| 15           | Mini Project using Digital Productivity and Collaboration Tools            | 02        |
| <b>TOTAL</b> |                                                                            | <b>30</b> |

#### COURSE EVALUATION & ASSESSMENT RUBRICS:

| Component  | CE/ESE | Evaluation Methodology / Rubrics                                                                                                                     | Marks | Passing Marks |
|------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| Theory     | CE     | Two Internal Tests of 30 marks each shall be conducted during the semester. The average of both tests will be converted to 30 marks.                 | 30    | 00            |
|            | ESE    | Comprehensive written examination covering all modules of the course. Duration: 2 Hours                                                              | 50    | 20            |
| Practical  | CE     | Performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 30 marks.         | 30    | 00            |
|            | ESE    | Quiz / Practical Performance – 25Marks<br>External Viva Voce – 25 Marks                                                                              | 50    | 20            |
| Assignment | CE     | The assignment will be evaluated based on the student's understanding of digital literacy concepts, accuracy and relevance of the content, practical | 40    | 00            |

|                    |  |                                                                                                                                                                                                                           |            |           |
|--------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
|                    |  | application of digital tools, organization and presentation of the work, originality, and timely submission. Marks will be awarded for clarity, completeness, and the effective demonstration of digital literacy skills. |            |           |
| <b>TOTAL MARKS</b> |  |                                                                                                                                                                                                                           | <b>200</b> | <b>80</b> |

**TEXT BOOK(S):**

| Title            | Author/s      | Publication        |
|------------------|---------------|--------------------|
| Digital Literacy | Faithe Wempen | Wiley Publications |

**REFERENCE BOOK(S):**

| Title                     | Author/s                  | Publication      |
|---------------------------|---------------------------|------------------|
| Computer Fundamentals     | P. K. Sinha & Priti Sinha | BPB Publications |
| Cyber Security Essentials | Charles J. Brooks         | Wiley            |

**COURSE OUTCOME(S):**

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

| ICAIT1030 | Digital Literacy                                                                                                       |
|-----------|------------------------------------------------------------------------------------------------------------------------|
| CO 1      | Explain the fundamentals of digital technologies, computer systems, and internet services.                             |
| CO 2      | Utilize digital communication and collaboration tools for academic and professional activities.                        |
| CO 3      | Create and manage digital documents, spreadsheets, and presentations using productivity tools.                         |
| CO 4      | Apply cyber security practices and digital ethics for safe and responsible use of technology.                          |
| CO 5      | Evaluate emerging digital technologies and utilize digital platforms for learning, communication, and problem-solving. |

**MAPPING OF CO WITH PO:**

| ICAIT1030 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO 1      | 3   | 2   | 1   | 0   | 2   | 0   | 0   | 0   |
| CO 2      | 1   | 2   | 2   | 0   | 3   | 0   | 0   | 0   |
| CO 3      | 2   | 3   | 3   | 2   | 3   | 2   | 0   | 1   |
| CO 4      | 0   | 1   | 1   | 0   | -   | 3   | 3   | 0   |
| CO 5      | 2   | 2   | 3   | 2   | 3   | 2   | 1   | 2   |

**MAPPING OF CO WITH PSO:**

| ICAIT1030 | PSO1 | PSO2 | PSO3 |
|-----------|------|------|------|
| CO 1      | 2    | 1    | 1    |
| CO 2      | 2    | 2    | 1    |
| CO 3      | 3    | 3    | 2    |
| CO 4      | 2    | 1    | 3    |
| CO 5      | 3    | 2    | 3    |

**LEVEL OF REVISED BLOOM'S TAXONOMY IN ASSESSMENT**

|             |               |           |
|-------------|---------------|-----------|
| 1: Remember | 2: Understand | 3: Apply  |
| 4: Analyze  | 5: Evaluate   | 6: Create |

| Module No | Content                                      | RBT Level |
|-----------|----------------------------------------------|-----------|
| 1         | Introduction to Digital Literacy             | 1,2       |
| 2         | Internet and Digital Communication           | 2,3       |
| 3         | Digital Documentation and Productivity Tools | 3         |
| 4         | Digital Presentation and Cloud Collaboration | 3,4       |
| 5         | Cyber Security and Digital Ethics            | 4,5       |
| 6         | Emerging Digital Technologies                | 5,6       |