Revised Syllabus as per NEP 2020 with effect from the Academic Year 2026-2027

Bachelor of Computer Applications (BCA)
Semester – I

Course Code	**US1SEBCA19**	**Title of the Course**	**Introduction to Computer Organization**
Total Credits	**02 Credits**	**Hours per Week**	**02 Hours / Week**

Course Learning Outcomes (CLOs)	
CLO 1	Understand number systems, data representation, and the basic structure of a computer system. Analyze combinational circuits, instruction formats, timing signals, and control unit operations.
CLO 2	Evaluate CPU organization concepts such as stack organization and addressing modes. Apply concepts of interrupts and Direct Memory Access (DMA) in input-output organization.

Course Content		
Unit No.	**Description**	**Weightage (%)**
1.	**Introduction to Computer Systems, Number Systems, Representation of Information and Processor Organization** • Block diagram of a simple computer and significance of different functional units • Definitions of the terms: hardware, software • Binary, octal, decimal, and hexadecimal number systems • Conversion of numbers: binary to decimal and decimal to binary • Addition and subtraction of binary numbers • Representation of integers • Character codes (ASCII, Unicode) • Instruction execution cycle • CPU organization • Array processors	**50%**
2.	**Memory Organization, Addressing Techniques and I/O Devices** • Primary memory: Introduction to RAM and ROM, Cache, Registers • Secondary memory: Various types and organization of secondary storage devices such as magnetic disks, optical disks, flash memories	**50%**

	• Addressing techniques like Immediate, Direct, Indirect, Register, Indexing and Stack • Common types of Input such as Monitors, keyboard, mouse Common types Output devices, Printers(Line, Dot Matrix, Inkjet, Laser),Scanners	

Teaching – Learning Methodology
The course would be taught /learnt through ICT (e.g. Power Point Presentation, Audio-Visual Presentation), Lectures, Quizzes, Assignments, Case Study and Browsing E- Resources & Practical Learning.

Examination Evaluation Pattern		
Sr. No.	**Particulars**	**Weightage (%)**
01	Continuous and Comprehensive Evaluation (CCE) (Formative Assessment)	50%
02	Semester End Evaluation (SEE) (Summative Assessment)	50%
	TOTAL	**100%**

Specifications for CCE and SEE			
Sr. No.	**Details of the Evaluation Pattern**		**Marks**
01	Continuous and Comprehensive Evaluation (CCE) (Formative Assessment)		
	A	Assignments	10
	B	Multiple Choice Questions	05
	C	Attendance	05
	D	Written Examination (01 Hour)	30
	(Formative Assessment) (A + B + C + D)		**50 Marks**
	Note: • For 02 Credit Courses, the Formative Assessment for students must be from 25 Marks. Thus, the total obtained marks from A + B + C + D (50 Marks) will be divided by 02.		**25 Marks**
02	Semester End Evaluation (SEE) (Summative Assessment)		
	E	Written Examination (01 Hour)	**25 Marks**
	TOTAL		**50 Marks**

Rubrics – Based Assessment for Assignments (10 Marks)		
Excellent	09 – 10 Marks	Accurate, error-free, logically presented, timely submission
Good	07 – 08 Marks	Minor errors and good conceptual clarity
Average	05 – 06 Marks	Basic understanding or partially correct
Basic	03 – 04 Marks	Limited clarity, noticeable mistakes, incomplete content
Poor	01 – 02 Marks	Inadequate conceptual clarity, incorrect content
Below Poor	Zero Marks / NA	Content is irrelevant / Not Attempted / Not Submitted

Note:

- Assignments may be taken in forms of written project, computerized and online suggested courses / certificates as per the decision made by the respective faculties of the courses.

Rubrics – Based Assessment for Multiple Choice Questions (05 Marks)		
05 Multiple Choice Questions – 01 Mark Each (05 Marks)		
Excellent	01 Mark	The chosen option is correct, no errors in response
Below Poor	Zero Marks / NA	Chosen option is incorrect, completely irrelevant, multiple options chosen / Not Attempted

Rubrics – Based Assessment for Attendance (05 Marks)		
As per the Rules and Regulations provided by the Academic Section of Sardar Patel University, Vallabh Vidyanagar, for the students studying in all departments and colleges. Reference No.: E – 3 / 3127; dated: 07-03-2024. https://www.spuvvn.edu/orbit-cdn/uploads/circulars/Circular-NEP-InternalExamMarks-March-April24.pdf		
Excellent	05 Marks	More than 90% (Minimum 27 Hours for 02 Credits Courses)
Good	04 Marks	80% - 89% (24 to 26 Hours for 02 Credit Courses)
Average	03 Marks	70% - 79% (21 to 23 Hours for 02 Credit Courses)
Poor	Zero / NA	Less than 70% (**NOT ELIGIBLE TO APPEAR FOR EXAM**)

Note:

- Students with below 70% of attendance must submit their written application to their respective class coordinators with genuine reasons and evidence (in case of working or medical emergencies). Students must **not** pursue dual degree programmes that clash with the college's timings.

Rubrics – Based Assessment for Mid-Semester Examination (30 Marks)		
Any One Unit or 50% of The Syllabus - 15 Marks Each Question		
Excellent	13 – 15 Marks	Demonstrates clear understanding of concepts such as number systems, CPU organization, memory structure, and addressing techniques; answers are accurate, well-explained, and logically structured with correct terminology and examples/diagrams where required.
Good	10 – 12 Marks	Shows good conceptual understanding with minor errors; answers are mostly correct and well-organized, with appropriate use of technical terms and basic illustrations.
Average	07 – 09 Marks	Displays basic understanding of topics; answers contain some conceptual gaps or minor inaccuracies; explanations are partially correct.
Basic	04 – 06 Marks	Indicates limited understanding of concepts; answers are incomplete, with noticeable errors and weak explanation.

Poor	01 – 03 Marks	Reflects inadequate understanding; major conceptual errors, incorrect explanations, and poorly structured answers.
Below Poor	Zero Marks / NA	No attempt or completely irrelevant answer.

Note:
- Written Examination questions will be based on various levels of Revised Bloom's Taxonomy.

Rubrics – Based Evaluation Pattern for End-Semester Examination (25 Marks)		
Multiple Choice Questions (05 Marks) – 01 Mark Each from all Units		
Excellent	01 Mark	The chosen option is correct, no errors in response
Below Poor	Zero Marks / NA	Chosen option is incorrect, completely irrelevant, multiple options chosen / Not Attempted
Short Question (08 Marks) – 4 Question from all Units		
Excellent	02 Marks	Demonstrates accurate understanding of concepts related to the question. Provides correct definitions, explanations, examples, diagrams and proper technical details with complete answers.
Good	01 Mark	Shows partial understanding of concepts with some correct points, explanations or examples. Minor mistakes or incomplete answers may be present.
Poor	00 Mark	Incorrect, irrelevant, or no response provided.
UNIT I - 06 Marks Each Question		
Excellent	05 – 06 Marks	Demonstrates deep understanding and critical analysis of computer system organization, functional units of computer, hardware and software concepts, number systems, number conversions, binary arithmetic, data representation, character codes (ASCII, Unicode), instruction execution cycle, CPU organization and array processors. Answers are logical, precise and supported with accurate examples, diagrams and explanations.
Good	04 – 05 Marks	Shows good understanding of computer organization concepts, number systems, data representation and processor organization. Explanations are clear with proper use of technical terms, diagrams and examples. Minor conceptual or calculation errors may be present.
Average	03 – 04 Marks	Demonstrates basic recall and understanding of computer system components, number systems and processor concepts. Limited analytical depth with incomplete explanations, examples or conversions.
Basic	02 – 03Marks	Shows partial understanding of hardware/software concepts, number systems, binary operations, instruction cycle and CPU organization. Answers contain noticeable mistakes, incomplete explanations and lack proper organization.
Poor	01 – 02 Marks	Demonstrates very limited understanding with major conceptual mistakes in computer organization, number systems and processor

		concepts. Answers contain incorrect conversions, unclear explanations and insufficient content.
Below Poor	Zero Marks / NA	No attempt or completely irrelevant answer.
UNIT II - 6 Marks Each Question		
Excellent	05 – 06 Marks	Demonstrates deep understanding and critical analysis of memory organization, primary and secondary memory, RAM, ROM, Cache, Registers, storage devices, addressing techniques (Immediate, Direct, Indirect, Register, Indexing and Stack) and input/output devices. Answers are logical, precise and supported with suitable examples and diagrams.
Good	04 – 05 Marks	Shows good understanding of memory hierarchy, storage devices, addressing modes and I/O devices. Explanations are clear with appropriate examples and technical terminology. Minor conceptual errors may be present.
Average	03 – 04 Marks	Demonstrates basic understanding of memory organization, addressing techniques and input/output devices. Answers show limited explanation, incomplete examples and average presentation.
Basic	02 – 03Marks	Shows partial understanding of memory concepts, storage devices and addressing modes. Explanations are incomplete with noticeable mistakes and lack of proper organization.
Poor	01 – 02 Marks	Demonstrates very poor understanding with major conceptual errors related to memory, addressing techniques and I/O devices. Answers contain incorrect information and insufficient content.
Below Poor	Zero Marks / NA	No attempt or completely irrelevant answer.

Note:
- Multiple Choice Questions of 5 Marks will be based on various levels of Revised Bloom's Taxonomy.
- Written Examination questions will be based on various levels of Revised Bloom's Taxonomy.

PLO – CLO Mapping

Introduction to Computer Organization

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CLO 1	03	02	02	00	02	00
CLO 2	02	03	02	00	01	03

Note:
- High: **03**; Moderate: **02**; Low: **01**; No Mapping: **00s**

Suggested References and E-Resources for Further Reading

- Tanenbaum A.S., Structured Computer Organization, Prentice-HallofIndiaPvt.Ltd,5thedition,
- 2005.
- RajaramanV, Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.(4thEdition),2003.
- P.K.Sinha,PritiSinha, Computer Fundamentals,6thEdition,2003.
- https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/
- Computer System Organisation