21IoT10	COMPUTER DESIGN	L	T	P	C
		3	0	0	3

Course Objectives

- This course will facilitate the students to learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design.

UNIT I	FUNDAMENTAL OF COMPUTER DESIGN	9 Hours

Basic Structure of Computers: Computer Types; Functional Units; Bus structure; Performance-Processor Clock, Basic Performance Equation, Clock rate; Historical Perspective; Machine Instructions and Programs: Numbers, Arithmetic Operations and Characters; Memory Location and Addresses; Memory Operations; Instructions and Instruction Sequencing.

UNIT II	HW/SW PARTITIONING METHODOLOGIES	9 Hours

Partitioning-Types of partitioning-Partitioning granularity - Kernigan-Lin Algorithm - Extended Partitioning - Binary Partitioning: GCLP Algorithm

UNIT III	DESIGN SPECIFICATION AND VERIFICATION	9 Hours

Design, co-design, the co-design computational model, concurrency coordinating concurrent computations, interfacing components, design verification, implementation verification, verification tools, interface verification

UNIT IV	ESTIMATION: HARDWARE	9 Hours

Hardware area, execution timing and power, Case studies

UNIT V	ESTIMATION: SOFTWARE	9 Hours

Software memory and execution timing, Worst Case Execution Time, Case studies

Course Outcomes:

- This will help the students to be familiarized with the hardware components and concepts related to the control design
- This will also help the students to be familiarized with addressing modes, different types of partitioning methodologies.
- Students will learn about various I/O devices and the I/O interface.

- The student will be able to learn the hardware components and concepts related to the memory organization.

Text books:

1. Soonhoi Ha, Jürgen Teich, "Handbook of Hardware/Software Codesign", Springer , 2017.
2. Giovanni De Micheli, Mariagiovanna Sami, "Hardware / Software Co- Design", 2002, Kluwer Academic Publishers.

Reference Books:

1. Schaumont, Patrick, A," A Practical Introduction to Hardware/Software Codesign", 2013, reprint, Springer, India.
2. Patrick R. Schaumont, "A Practical Introduction to Hardware/Software Co-design", 2010, Springer.