**Course Code:** E2UC505T

**Course Name:** Computer Organization and Architecture

**Introduction**: Functional units of digital system and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register, bus and memory transfer, Processor organization, general registers organization, stack organization and addressing modes.

**Arithmetic and logic unit:** Look ahead carries adders, Fixed point representations and Arithmetic Operations: Addition and Subtraction, Multiplication: Signed operand multiplication, Booth’s algorithm and array multiplier. Division and logic operations. Floating point representations and arithmetic, IEEE Standard for Floating Point Numbers.

**Control Unit:** Instruction types, formats, instruction cycles and sub cycles (fetch and execute etc), micro-operations, execution of a complete instruction. Program Control, Reduced Instruction Set Computer, Pipelining, Hardwired and Microprogrammed control unit.

**Input / Output:** Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, standard communication interfaces.

**Memory:** Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 1/2D memory organization. ROM memories. Cache memories: concept and design issues performance, address mapping and replacement Auxiliary memories: magnetic disk, magnetic tape and optical disks Virtual memory: concept implementation.