| **Course Code** | BCA20020 | | | | |
| --- | --- | --- | --- | --- | --- |
| **Course Category** | **Program Foundation** | | | | |
| **Course Title** | **Computer Organization and Introduction to Microprocessor** | | | | |
| **Teaching Scheme** | **Lectures** | **Tutorials** | **Laboratory / Practical** | **Project** | **Total** |
| **Weekly load hours** | 3 | **-** |  | **-** | **3** |
| **Credits** | **3** |  |  | **-** | **3** |
| **Assessment Scheme Code** | **TT1** | | | | |
| **Pre-requisites**: Need basics of web technologies and basics of Programming concepts. | | | | | |
| **Course Objectives:**   1. To understand the design of digital computer's various functional units and components. 2. To explain the function of each element of a memory hierarchy, identify and   compare different methods for computer I/O.   1. To understand the structure, function and characteristics of Microprocessor | | | | | |
| **Course Outcomes:**  Students will be able to:  1. Demonstrate computer organization concepts related to the design of modern processors, memories, and I/Os.  2. Analyze the performance of commercially available computers.  3. Develop logic for assembly language programming.  4. Understand the components of a Microprocessor.  5. Understand computer organization concepts and structure. | | | | | |
| **Course Contents:**  **Unit 1 : CPU Organization:10**  Concept of Address Bus, Data Bus, Control Bus. CPU Block Diagram and Explanation of each block, register based CPU organization, Concept of Stack & its organization, Block Diagram of ALU, CPU Building Blocks Hardwired and Micro Program control, RISC vs. CISC Pipelining – Data Path, Time Space Diagram, Hazards  **Unit 2 : Memory Organization:10**  Memory Architecture, Memory hierarchy, Types of Memories, Primary Memory – DRAM, SDRAM, DDR, RDAM. ROM, PROM, EPROM, EEPROM, Cache  memory Structure DMA, DMA interfacing with processor Data Read/ Write  process, Role of Cache memory, Virtual Memory.  **Unit 3 : I/O Interfaces :10**  Block dig. of I/O interface, Serial communication interfaces, Asynchronous communication and synchronous communication, Parallel communication, DMA controller.  **Unit 4 : Introduction to 8086 Microprocessor. 15**  Introduction to 8086 microprocessor, Real mode & protected mode, Processor Register, addressing modes and opcode concept, Interrupts, Bus formats and operation, Construction of instruction word and instruction cycle and execute cycle. Concept of parallelism, parallel computer structures, concept of pipeline, instruction pipeline. Concept of RISC and CISC. Concept of Algorithms and Flowcharts (Definitions, Symbols, Characteristics. | | | | | |
| **Learning Resources:**  **Text Books/Reference Books:**   1. Computer Fundamentals, P. K. Sinha, BPB Publication, 8th Edition. 2. 2. Microprocessor and Interfacing, D. V. Hall, McGraw Hill Publication, 2nd Edition. 3. 3. Microprocessor X 86 Programming, K.R. Venugopal, BPB Publication, 4th Edition 4. 4. Computer Motherboard Testing and Fault finding, S. K. Gupta, BPB Publication, 2nd Edition. 5. 5. PC Hardware (A+ Certificate guide), Mike Mayer, Technical Publication,5th Edition. 6. 6. PC Hardware interfaces, Michael Gook, A-List, LLC,7th Edition.   **Supplementary Reading:**   1. . Computer System Architecture: Morris Mano, Prentice-Hall.International,3rd Edition 2. 2. Computer Organization and architecture: William Stalling, Prentice-Hall,6th Edition 3. 3. Microprocessor and Interfacing Programming and Hardware: Douglas Hall, Tata McGraw Hill, 9th 4. Edition 5. 4. Computer Architecture and Organization by John P Hayes, Tata McGraw Hill, 4th Edition.   **Web Resources :**  **Weblinks:**   1. [http://www.w3schools.com](http://www.w3schools.com/) 2. Tutorial   **MOOCs: Online courses for self-learning**  **Courses by NPTEL and MIT Open Courseware etc Pedagogy:**  Participative Learning, discussions,  problem solving,  assignments,  Lab Assignment | | | | | |