

Subject Code: 1ET4040405	Subject Title: Computer Organization And Architecture
Pre-Requisite	--

RATIONALE:

This course describes design architecture for an electronic digital computer with subdivisions of central arithmetic part, a central control part, a memory to store data and instructions, external storage, CPU processing and input-output organization. It provides detail of computer system's functional components, their characteristics, performance and interactions including system bus, various levels of memory and input/output mechanisms and CPU.

COURSE OBJECTIVE:

- Describe the organization of a computer system in terms of its main components.
- Discuss the basic concepts and structure of computers.
- Identify various parts of a system memory hierarchy.
- Understand concepts of register transfer logic and arithmetic operations.
- Explain different types of addressing modes, memory organization and I/O organization.
- Learn the different types of data transfer modes and techniques.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment
3	-	-	3	60	40	-	-

DETAILS OF COURSE CONTENTS:

S. NO.	Topic and Sub-Topics	Total Hrs.	WEIGHTAGE %
Unit - 1	Computer Architecture & Register- Transfer and Micro- operations Register - Transfer-Language, Register Transfer, Bus Transfer and Memory Transfer, Arithmetic Micro-Operations- Addition, Subtraction, Complements, Negation, Increment and Decrement	10	25
Unit - 2	Basic Computer Organization Instruction codes, Computer Registers- AC or Accumulator, Data Register or DR, the AR or Address	11	25

	Register, program counter (PC), Memory Data Register (MDR), Index register, Memory Buffer Register, Instruction Cycle, Memory Reference Instructions, Input-Output and Interrupt, Addressing Modes		
Unit - 3	Input/output Organization Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer- Strobe Control and Handshaking, Modes of Data Transfer, Direct Memory Access (DMA), Input-Output Processor (IOP), CPU-IOP Communication	11	25
Unit - 4	Memory Organization Memory Hierarchy, Memory Classification, Main Memory (RAM), Types of ROM, Auxiliary Memory, Cache Memory, Virtual Memory	10	25

COURSE OUTCOME:

At the end of the course the students are able to:

1. Understand the theory and architecture of central processing unit.
2. Analyze some of the design issues in terms of speed, technology, cost, performance.
3. Understand the functional units of CPU processor with applying the theory concepts.
4. Understand the architecture and functionality of central processing unit.
5. Exemplify in a better way the I/O and memory organization.
6. Describe addressing modes, instruction formats and program control statements.

SUGGESTED LIST OF EXERCISES/PRACTICAL/EXPERIMENTS:

There are no practical in this course and hence it is not applicable

LIST OF REFERENCES:

Text Books

Computer System Architecture by M. Morris Mano (Pearson Education India)

Reference Books

Computer Architecture and Organization by Ghoshal, Subrata (Pearson Education India)

E- Learning References

1. <http://www.ddegjust.ac.in/studymaterial/msc-cs/ms-07.pdf>
2. <http://www.iitg.ernet.in/asahu/cs222/Lects/>
3. http://www.srmuniv.ac.in/downloads/computer_architecture.pdf