Semester: V	
Programme : B.Sc. Computer Science (Hons)	
Course : MICROPROCESSOR	
Paper code: C3CS230542T / C3CS230542P	**Credits: 4**
Hours/week : Theory: 3 / Practical 2	
Category: Core/MDC/SEC/VAC : Core	
Theory / Practical / Composite : Composite	
No of Modules : 1	

Course Overview - This course provides a comprehensive introduction to microprocessor architecture, programming, and system design. It covers the fundamental architectures of 8-bit, 16-bit, and 32-bit microprocessors, with detailed study of the 8085 and 80x86 families and their assembly language programming. The course introduces core concepts of memory and peripheral interfacing, emphasizing practical system design using 8-bit microprocessors and associated chips. Students also explore techniques for improving execution speed and overall processor performance. In addition, the course offers an overview of advanced processor architectures, including the 80x86 series, Pentium processors, and modern multi-core systems, preparing learners for both foundational understanding and advanced study in microprocessor-based systems.

Course Outcome:

1. **Recall and Explain** the fundamental architecture and operation of 8-bit, 16-bit, and 32-bit microprocessors, including the 8085 and 80x86 processor families.
2. **Apply** assembly language programming techniques to develop and execute programs for 8085/80x86 microprocessors.
3. **Analyze** microprocessor-based systems to understand instruction execution, timing, and performance characteristics.
4. **Design** memory and peripheral interfacing schemes for 8-bit microprocessor-based systems using appropriate hardware components.
5. **Evaluate** techniques for improving instruction execution speed and overall performance of microprocessor systems.
6. **Create** basic microprocessor-based system designs incorporating advanced processor architectures such as 80x86, Pentium, and multi-core processors.

Prerequisites: Computer Organization

SYLLABUS

UNIT/Module	CONTENT	HOURS	CO Mapping	COGNITIVE LEVEL
I.	Overview of microprocessors; architecture of 8-bit, 16-bit, and 32-bit microprocessors	6	CO1	K1, K2 (Recall, Explain)
II.	8085 microprocessor architecture and instruction set,	8	CO1, CO2	K1, K2, K3 (Recall, Explain, Apply)
III.	Assembly language programming using 8085	8	CO2	K3 (Apply)
IV.	Interfacing of memory devices; data transfer techniques and I/O ports; interfacing of keyboard and display devices; programmable interrupt and DMA controllers;	8	CO3, CO4	K4, K6 (Analyze, Design)

V.	Introduction to advanced microprocessors and microcontrollers and Embedded Systems	6	CO5, CO6	K5 (Evaluate)
VI.	Case Study – 8085, 80x86	4	CO5	K5, K6 (Evaluate, Create)

Text Books		
1. Barry B. Brey: The Intel Microprocessors: Architecture, Programming and Interfacing. Pearson Education, Sixth Edition, 2009		
2. Walter A Triebel, Avtar Singh; The 8088 and 8086 Microprocessors Programming, Interfacing, Software, Hardware, and Applications. PHI, Fourth Edition 2005.		
3. Microprocessor Architecture, programming and application with the 8085 – Ramesh S. Gaonkar, 4th Edition, Penram International Publishing.		
4. The 8051 Microcontrollers & Embedded Systems, 2e by MAZIDI, Pearson, Jan 2007		
Web Resources		
1. Microprocessor and Microcontrollers, IIT Kharagpur, by Shantanu Chattopadhyay https://nptel.ac.in/courses/108105102		
Evaluation	Theory CIA: 12 Attendance: 3 Semester Exam: 45	Practical CA: 38 Attendance: 2
Paper Structure for Theory Semester Exam Module : Answer 3 out of 5 of 15 marks each		

Course outcomes (COs) and Cognitive Level Mapping

COs	**CO Description**	**Cognitive levels**
CO1	Recall and explain the fundamental architecture, functional blocks, and operation of 8-bit, 16-bit, and 32-bit microprocessors, including the 8085 and 80x86 processor families	K1-K2 (Recall/Explain)
CO2	Apply assembly language programming concepts to write, execute, and debug programs for 8085 and 80x86 microprocessors.	K3 (Apply)
CO3	Analyze memory organization, address decoding techniques, and peripheral interfacing methods in microprocessor-based systems.	K4 (Analyse)
CO4	Design microprocessor-based systems by interfacing memory and peripheral devices with an 8-bit microprocessor.	K6 (Design)
CO5	Evaluate techniques for improving instruction execution speed, system throughput, and overall performance of microprocessors.	K5 (Evaluate)

CO6	Create basic system-level designs using advanced processor architectures such as 80x86, Pentium, and multi-core processors.	K6 (Create)