UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN COMPUTER SCIENCE

SYLLABUS WITH EFFECT FROM 2023-2024

Year: I **Semester: II**

Introduction to Computer Architecture and Microprocessor	**125C2A**
Credits 5	**Lecture Hours:4 per week**

Learning Objectives: (for teachers: what they have to do in the class/lab/field)

- To introduce the internal organization of Intel 8085 Microprocessor.
- To enable the students to write assembly language programs using 8085.
- To interface the peripheral devices to 8085 using Interrupt controller and DMA interface.

Course Outcomes: (for students: To know what they are going to learn)

CO1: Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the architecture of 8085.

CO2: Understanding the 8085 instruction set and their classifications, enables the students to write the programs easily on their own using different logic..

CO3: Applying different types of instructions to convert binary codes and analysing the outcome. The instruction set is applied to develop programs on multibyte arithmetic operations.

CO4: Analyse how peripheral devices are connected to 8085 using Interrupts and DMA controller.

Units	**Contents**
I	Digital Computers - Microcomputer Organization-Computer languages Number Systems: Decimal, Binary, Octal. Hexadecimal. Conversions: Conversion between all four number systems of integer and floating-point values. Data representation: fixed point and floating-point representation - Character codes
II	Addition, subtraction (9's Complement for decimal, 10's complement for decimal, 1's complement, 2's complement methods), multiplication and division of binary numbers. - Differentiate Binary and BCD representations - BCD to Binary and Binary to BCD conversions, BCD addition and Subtraction. 8085 Microprocessor: Architecture, Pinout and Signals – Functional block diagram -
III	8085 Instruction Set and addressing modes- 8085 sample programs using data transfer, arithmetic and JMP instructions– function calls in 8085
IV	The 8085 Interrupts – RIM AND SIM instructions-8259 Programmable Interrupt Controller-Direct Memory Access (DMA) and 8257 DMA controller.
V	Program control- RISC - Pipelining -Arithmetic instruction- RISC pipeline - Vector processing and Array processors.

TEXT BOOKS:

1. M.M. Mano, “Computer System architecture”. Pearson, Third Edition, 2007

2. R. S. Gaonkar- "Microprocessor Architecture- Programming and Applications with 8085"- 5th Edition- Penram- 2009.

3. Tripti Dodiya & Zakiya Malek, “Computer Organization and Advanced Microprocessors”, CengageLearning, 2012.

REFERENCE BOOKS:

1. Mathur- “Introduction to Microprocessor”- 3rd Edition- Tata McGraw-Hill-1993.

2. P. K. Ghosh and P. R. Sridhar- “0000 to 8085: Introduction to Microprocessors for Engineers andScientists”- 2nd Edition- PHI- 1995.

3. NagoorKani- “Microprocessor (8085) and its Applications”- 2nd Edition- RBA Publications- 2006.

4. V. Vijayendran- “Fundamentals of Microprocessors – 8085”- S. Viswanathan Pvt. Ltd.- 2008.

WEB REFERENCES:

NPTEL & MOOC courses titled Computer organization

https://nptel.ac.in/courses/106105163/

https://nptel.ac.in/courses/106103068