UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN PHYSICS

SYLLABUS WITH EFFECT FROM 2023-2024

337C6C

COURSE	**SIXTH SEMESTER – CORE COURSE – X**
COURSETITLE	**DIGITAL ELECTRONICS AND MICROPROCESSOR 8085**
CREDITS	**3**
COURSE OBJECTIVES	To learn all types of number systems, Boolean algebra and identities, digital circuits for addition and subtraction, flip-flops, registers, counters. To get the knowledge on fundamentals of 8085 architecture, instruction sets and simple programs.

UNITS	COURSE DETAILS
UNIT-I	Decimal, Binary, Octal, Hexadecimal Numbers Systems and their Conversions – Codes: BCD, Gray and Excess-3 Codes – Code Conversions –Complements (1's, 2's, 9's And 10's) – Binary Addition, Binary Subtraction using 1's & 2's Complement Methods – Boolean Laws – De-Morgan's Theorem –Basic Logic Gates -Universal Logic Gates (NAND & NOR) – Standard Representation of Logic Functions (SOP & POS) – Minimization Techniques (Karnaugh Map: 2, 3, 4 Variables).
UNIT-II	Adders,Half&Full Adder –Subtractors,Half&Full Subtractor – Parallel Binary Adder – Magnitude Comparator – Multiplexers (4:1) &Demultiplexers (1:4), Encoder (8-Line-To-3- Line) And Decoder (3-Line-To-8-Line), BCD to Seven Segment Decoder.
UNIT-III	**Flip-Flops:** S-R Flip-Flop , J-K Flip-Flop, T and D Type Flip-Flops, Master-Slave Flip-Flop, Truth Tables, Registers:- Serial in Serial Out And Parallel in And Parallel Out – Counters Asynchronous:-Mod-8, Mod-10, Synchronous - 4-Bit &Ring Counter – General Memory Operations, ROM, RAM (Static And Dynamic), PROM, EPROM, EEPROM, EAROM. IC – Logic Families: RTL, DTL, TTL Logic, CMOS NAND & NOR Gates, CMOS Inverter, Programmable Logic Devices – Programmable Logic Array (PLA), Programmable Array Logic (PAL).
UNIT-IV	**8085 Microprocessor:** Introduction To Microprocessor – INTEL 8085 Architecture – Register Organization –Pin Configuration Of 8085, Interrupts And Its Priority – Program Status Word (PSW) – Instruction Set Of 8085 –Addressing Modes Of 8085 –Assembly Language Programming Using 8085 –Programmes For Addition (8-Bit & 16-Bit), Subtraction (8-Bit & 16-Bit), Multiplication (8-Bit), Division (8- Bit) – Largest And Smallest Number In An Array – BCD To ASCII And ASCII To BCD.
UNIT-V	**I/O Interfaces:** Serial Communication Interface (8251-USART) – Programmable Peripheral Interface (8255-PPI) –Programmable Interval Timers (8253) – Keyboard And Display (8279), DMA Controller (8237).

TEXT BOOKS	1. M.Morris Mano, "Digital Design "3rd Edition, PHI, NewDelhi. 2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi. 1999.(UNITS I to IV) 3. S.Salivahana& S. Arivazhagan-Digital circuits and design 4. Microprocessor Architecture, Programming and Applications with the 8085 – Penram International Publishing, Mumbai.- Ramesh S.Gaonakar 5. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and GlenSA
REFERENCE BOOKS	1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics" . McGraw Hill. 1985. 2. S.K. Bose. "Digital Systems". 2/e. New Age International.1992. 3. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters: Fundamentals &Applications". TMH.1994. 4. Malvino and Leach. "Digital Principles and Applications". TMG HillEdition 5. Microprocessors and Interfacing – Douglas V.Hall 6. Microprocessor and Digital Systems – Douglas V.Hall
WEBLINKS	1. https://youtu.be/-paFaxtTCkI 2. https://youtu.be/s1DSZEaCX_g