



**PARVATHANENI BRAHMAYYA  
SIDDHARTHA COLLEGE OF ARTS & SCIENCE**  
*Autonomous*  
Siddhartha Nagar, Vijayawada-520010  
*Re-accredited at 'A+' by the NAAC*

### **MICROPROCESSORS AND MICROCONTROLLERS**

Offered to : M.Sc.(PHYSICS)	Course Code : 22PH3D5
Course Type : Domain specific elective (DSE)	Course : MICROPROCESSORS AND MICROCONTROLLERS
Year of Introduction : 2022	Year of offering : 2022
Year of Revision : 2022	Percentage of Revision : Nil
Semester : III	Credits : 4
Hours Taught : 60 hrs. per Semester	Max.Time : 3 Hours

#### **Course Description:**

Microprocessors And Microcontrollers is essential course for students to know the fundamentals and applications of the microprocessor and microcontroller systems. The student will be able to incorporate these concepts into their electronic designs where control can be achieved via a microprocessor/controller implementation

#### **Course objectives:**

- 1.To understand the concepts of microprocessor and microcontrollers.
- 2.To enable design and programming of microcontroller based system.
- 3.To know about the interfacing Circuits
4. To have strong foundation for designing real world applications using microprocessors and microcontrollers
5. Get familiar with real time operating system

#### **Course outcomes:**

At the end of this course the students should be able to:

CO1:Gain good knowledge on microcontrollers and implement in practical applications

CO2:Learn Interfacing of Microcontroller

CO3:Learn the architecture, pin configuration, instruction set and programming of 8051

CO4: Learn the architecture and addressing modes of 8086

CO5: Learn the instruction set and programming of 8086 microprocessor

CO - PO MATRIX								
	CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
22PH3D5	CO1	M					M	M
	CO2	M					M	M
	CO3	M					M	M
	CO4	M					M	M
	CO5	M					M	M

Syllabus		
Unit	Learning Units	Lecture Hours
I	<b>Introduction Microcontroller</b> Introduction, Microcontrollers and Microprocessors, History of Microcontrollers and Microprocessors, Embedded versus External Memory devices, 8-bit and 16-bit Microcontrollers, CISC and RISC Processors, Harvard and Von Neumann Architectures, Commercial Microcontroller devices; MCS-51 family, Atmel Microcontrollers, PIC Microcontrollers.	12
II	<b>Interfacing I/O Devices</b> Introduction to I/O Interface, I/O Port Address Decoding, Programmable Peripheral Interfaces, Programmable Keyboard Interface, Programmable Interval Timer, Programmable Communications Interface.	12
III	<b>8051 Microprocessor</b> 8051 PIN Description, Connections, Parallel I/O Ports, 8051 Memory organization, Addressing Modes; Register Addressing, Direct Addressing, Register Indirect Addressing, Immediate Addressing and Base Register plus index register – Indirect Addressing, MCS - 51 Instruction Set, 8051 Instructions, Simple Programs.	12
IV	<b>8086 Microprocessor</b> Pin Description, Operation Modes, Minimum Modes and Maximum Modes, Registers of Intel 8086, Internal Architecture of 8086 Microprocessor, Segment Register and Memory Segmentation, Data Registers, Pointer and Index Registers, Status Register, The Stack, Input/output Address Space, Addressing Modes of the 8086.	12
V	<b>8086 Microprocessor Instructions &amp; Programming</b> The Instruction set of the 8088/8086, Data Transfer Instruction, Arithmetic Instructions, Logic Instructions, Shift Instructions, Rotate Instructions, Flag Control instructions Compare Instruction Jump Instructions, Subroutines and Subroutine – Handling Instructions, The Loop and Loop Handling Instructions, Strings and String-Handling Instructions. Assembly Language programs of 8086	12

**Text Books and Reference Books:**

1. Microcontrollers Theory and Applications by Ajay V Deshmukh ,Tata McGraw Hill
2. The Intel Microprocessors by Barry B. Brey& C.R. Sarma, Pearson Education
3. Fundamental of microprocessor and microcomputer By B. Ram, Dhanpat Rai Publications
4. Muhammad Ali Mazidi : The 8051 Microcontroller and Embedded Systems
5. Microprocessor Architecture Programming and Application By Ramesh S. Gaonkar