P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

Autonomous - ISO 9001 – 2015 Certified

Title of the Paper: MICROPROCESSOR SYSTEM

Offered to: B.SC (M.ECs, CA.M.E) –22ELET31A   **Course Type:** Core (TH) /Core(p)

Year of Introduction: 2022-23   **Year of Revision:**   **Percentage of Revision:**

Semester : III   **Credits : 4**

Hours Taught: 60 hrs. Per Semester   **Max. Time** : 3 Hours

Course Prerequisites:

Introduction of Digital Electronics

COURSE OBJECTIVES:

1. To understand basic architecture of 16 bit & interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
2. To understand RISC based microprocessors and concept of multi core processors.
3. The student can gain good knowledge on microprocessor and implement in practical applications
4. Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
5. To Understand and devise techniques for faster execution of instructions improve speed of operations and enhance performance of microprocessors.

Course outcomes:

At the end of the course, the student will be able to

CO_1: To gain knowledge on micro processors 8086 architectures and implement in practical application.

CO_2: To understand and device techniques for faster execution of instructions, improve the speed of operation and enhance performance of microprocessor.

CO_3: To apply various assembly language programs and test using moderate complexity.

CO_4: To understand the memory chips and peripheral chips for 16-bit 8086 microprocessor.

CO_5: To remember multi core processor and its advantages of ARMTDMIS.

UNIT -I: (15Hrs)

CPU ARCHITECTURE

Introduction to Microprocessor, INTEL -8085(μP) Architecture, CPU, ALU unit, Register organization, Address, data and control Buses. Pin configuration of 8085, 8086 Architecture, Evaluation of Microprocessor, Internal operation, Pin description. Instruction format, Machine language instructions, Instruction Execution timing, Addressing modes

UNIT -II: (10 Hrs)

INSTRUCTION SET: Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Flag Manipulation , Shift and rotate Instruction, Loop Instruction

UNIT -III: (15Hrs)

Assembly Language Programming, Programmes for Addition, Subtraction, Multiplication, Find the largest and smallest number in an array. Modular programming:–Linking and Relocation, Stacks, Procedures, Interrupts and Interrupt Routines.

UNIT -IV: (10Hrs)

Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupt Priority Management I/O Interfaces: Serial Communication interfaces, Parallel Communication, Programmable Timers, Keyboard and display, DMA controller

UNIT -V: (10Hrs)

ARM PROCESSOR

Introduction to 16/32 bit processors, Arm architecture & organization, Arm based MCUs, Programming model, Instruction.

TEXT BOOKS:

   1. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson

   2. Microcontrollers Architecture Programming, Interfacing and System Design – Raj Kamal Chapter: 15.1, 15.2, 15.3, 15.4.1

  3.8086 and 8088 Microprocessor by Tribel and avatar singh

REFERENCES:

1. Microprocessors and Interfacing – Douglas V.Hall
2. Microprocessor and Digital Systems – Douglas V. Hall
3. Advanced Microprocessors & Microcontrollers - B.P.Singh & Renu Singh – New Age
4. The Intel Microprocessors – Architecture, Programming and Interfacing – Bary B. Brey.
5. Arm Architecture reference manual –Arm ltd.

Course Delivery method: Face-to-face / Blended
Course has focus on: Foundation and **S**kill Development
Websites of Interest: https://en.wikipedia.org/wiki/VHDL
Activities: Assignments, PPT's.

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Title: Microprocessor systems
MODEL PAPER

SECTION-A

Answer all Questions: 5x4=20M

1. a) Write about Machine language of 8086

(or)

  b) Explain about instruction format of 8086

2. a)Write a short note on Flag instructions

(or)

b) Explain about loop instructions in 8086

3.a) Discuss about stack pointer in 8086mp

(or)

b)Describe the function of a procedure in 8086mp

4.a) Explain about BSR mode in8255A

(or)

b) Draw the block diagram of interrupt priority management.

5.a)Explain about registers in ARM processor

(or)

b) Discuss about Air thematic instruction in ARM processor

SECTION-B

Answer all questions: 5x10=50M

6.a)Draw the Block diagram of 8086 microprocessor and explain each block in brief.

(or)

b)Draw the architecture of 8086mp and explain it.

7.a) Explain the following instruction set in brief (i)Data transfer (ii)Air thematic

(or)

b)Explain about various addressing modes of 8086.

8.a)Discuss about ALP format of 8086 in brief.

(or)

b)Write an Alp program to find largest number in an array.

9.a) Explain about minimum mode and maximum mode of 8086

(or)

b)Draw the block diagram of Programmable timer 8253 and explain in brief.

10.a)Explain about the architecture of ARM processor in brief

(or)

b)Explain pipeline process in arm and Arm based MCU.