Birla Institute of Technology & Science, Pilani

Hyderabad Campus

**Second Semester, 2019-2020**

**Course Handout (Part-II)**

06-01-2020

**In addition to Part I (General Handout for all courses appended to the Time Table), this portion gives further specific details regarding the course.**

**Course No*.* : CS/ECE/EEE/INSTR F241**

Course Title : Microprocessor Programming & Interfacing

**Instructor-in-charge : M.B. Srinivas**

**Team of Instructors :** Suvadip Batabyal, Karumbaiah Chappanda, Soumya J**,** S K Sahoo, Runa Kumari, Ramakant**,** Sandeep Kumar**,** Prashant Wali, Amit Ranjan Azad

**Course Description :** 8086 - 80486 Programmers model, processor architecture; Instruction set, modular assembly programming using subroutines, macros etc.; Timing diagrams ; Concept of interrupts: hardware & software interrupts, Interrupt handling techniques, Interrupt controllers; Types of Memory & memory interfacing; Programmable Peripheral devices and I/O Interfacing ; DMA controller and its interfacing: Design of processor based system.

**Text Book:**

T1: Barry B Brey, The Intel Microprocessors .Pearson, Eight Ed. 2009.

**Reference book:**

R1: Douglas V Hall, Microprocessor and Interfacing, TMH, Second Edition.

R2. Lyla B Das, [The x86 Microprocessors: 8086 to Pentium, Multicores, Atom and the 8051 Microcontroller: Architecture, Programming and Interfacing, Second Edition](https://www.amazon.in/x86-Microprocessors-Microcontroller-Architecture-Programming/dp/9332536821/ref=sr_1_2?s=books&ie=UTF8&qid=1514955138&sr=1-2&refinements=p_27%3ALyla+B.+Das" \o "The x86 Microprocessors: 8086 to Pentium, Multicores, Atom and the 8051 Microcontroller: Architecture, Programming and Interfacing, 2e)

R3: 8086 family User Manual, Intel Corporation

**Detailed Course Plan:**

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| --- | --- | --- | --- |
| **Lect. No.** | **Learning Objectives** | **Topics to be covered** | **Chapter in the Text Book** |
| 1. | Introduction to Microprocessor and Microcomputers | Compute Architecture, Memory & I/O organization, CISC/RISC processors | Chapter 1 (T1), Chapter 1 (R1) |
| 2-3 | Microprocessor & its architecture | 8086 Microprocessor | Chapter 2 (T1), Chapter 2 (R1) |
| 4-6 | Assembly Programming | Addressing Modes | Chapter 3 (T1) |
| 7-12 | Assembly Programming | Instruction Set & ALP | Chapter 4-6, 8 (T1) |
| 13-15 | 8086/8088 Hardware Specifications | Pin Out, Modes of operation, Clocking, Buses | Chapter 9 (T1) |
| 16-19 | Memory Interface | Memory Devices, Address Decoding- Memory Interface | Chapter -10 (T1) |
| 20-23 | I/O Interfacing | Basic I/O interfacing (I/O mapped I/O and Memory mapped I/O)  I/O port address decoding | 11.1, 11.2 (T1) |
| 24-26 | Interrupts | Types of interrupts, Vector tables, Priority Schemes | 12.1, 12.2, (T1) |
| 27-29 | Programmable Peripheral Devices | 8255,8254,ADC,DAC, 8259 | 11.3-11.6 & 12.3 -12.6 (T1) |
| 30-31 | DMA controller | Basic Operation, 8237, Shared Bus, Disk Memory Systems, Video Displays | Chapter -13 (T1) |
| 32-33 | Bus Interface | ISA, PCI, Com, USB,AGP | Chapter 15 (T1) |
| 34-36 | Advanced Processors | 80186-80286 | Chapter 16 (T1), Chapter 15 (R1) |
| 37-39 | Advanced Processors | 80386-80486 | Chapter 17 (T1), Chapter 15 (R1) |

**Evaluation Scheme:**

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| --- | --- | --- | --- | --- |
| **Component** | **Duration** | **Weightage (%) and Marks** | **Date & Time** | **Nature of Component** |
| Mid-Sem Test | 1 ½ Hour | 20% (60) | 2/3 1.30 -3.00 PM | Closed Book |
| Quizzes (2) | ---- | 10% (30) | Will be announced | Closed Book |
| LAB / Project Components | 2hrs/week | 10% (30) | Day to Day Evaluation | Practicals/Demo  (Open Book) |
| Project | 30% (90) | Will be announced | Open Book |
| Comprehensive Exam | 3 Hours | 30% (90) | 02/05 FN | Closed+Open Book |
| TOTAL |  | 100% (300) |  |  |

**Make-up Policy:**  There will no make-ups unless for genuine reasons. Prior Permission of the Instructor-in-Charge is required to take a make-up for any component. A make-up test shall be granted only in genuine cases as per institute guidelines.

**NO** make-up is allowed for quizzes.

**Chamber Consultation Hour**: Will be announced in the class.

**Notices**: Notices concerning to this course will be on **CMS**.

**Academic Honesty and Integrity Policy:** Academic honesty and integrity are to be maintained by all the students throughout the semester and no academic dishonesty of any kind is acceptable.

**M.B. Srinivas**

**Instructor-in-charge**

**(CS/EEE/ECE/INSTR F241)**