

**COLLEGE OF ELECTRICAL AND MECHANICAL ENGINEERING**  
**NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY**

**Title** : **EC 302 Microprocessor Based Design**  
**Credits** : **4(3,3)**  
**Instructor** : **Brig @ Rafiuddin**

**Objectives** : The objective of the course is to gain basic understanding of the architecture and operation of modern microprocessor based computer systems. Hardware and software concepts fundamental to the understanding of microprocessor and microcontroller systems will be covered. The Intel 80X86 family of microprocessors will be covered with emphasis on the 8086/8088. The focus will be on microprocessor system architecture, instruction sets, addressing modes, system timing, software design, assembly language programming, debug utility, interrupts and interfacing concepts of memory and input/output systems. Further Intel 8051 microcontroller will be discussed. A brief introduction to embedded systems and real-time operating (RTOS) will also be the part of the course.

**Course** :  
1. Introduction to Microprocessors and Microcomputers.  
2. Internal Architecture of 8086/8088 Microprocessors.  
3. Software Architecture of 8086/8088 Microprocessors.  
4. Addressing modes of the 8086/8088 Microprocessors.  
5. Machine language coding and the debug software development program of the IBM PC.  
6. Instruction set of 8086/8088 Microprocessor.  
7. Assembly Language Program development and the MICROSOFT MASM Assembler.  
8. Memory devices and interfacing.  
9. Input/output interfacing.  
10. Interrupts interface of the 8086/8088 Microprocessors.  
11. The Intel 8051 Microcontroller.  
12. Introduction to Embedded systems and Real-time operating systems (RTOS).

**Texts** :  
1. W.A.Treibel and A.Singh, "The 8088 and 8086 Microprocessors: Programming, Interfacing, Hardware, and Applications, 4/E, 2004, Prentice Hall.  
2. I.Scott Mackenzie, "The 8051 Microcontroller", 3/E, Prentice Hall.

**References** :  
1. Barry B.Brey, "Intel Microprocessors 8088 and 8086, 80186/80188, 80286, 80386, 80486 Pentium, Programming and Interfacing", 6/E Prentice Hall.  
2. Douglas V.Hall, Microprocessors and Interfacing – Programming and hardware, 2000.  
3. M.A.Mazidi & J.G. Mazidi; 80X86 IBM PC and Compatible Computers: Assembly Language ,Design, and Interfacing Volumes I&II, 4/E, Prentice Hall.  
4. K.R.Irvine; Assembly language for Intel-based Computers, Prentice Hall.

**Prerequisites** :  
1. Logic and Sequential Circuit Design.  
2. Computer Systems Architecture.

**Grading Policy** :  
Quiz 10%  
First mid-term exam 15%  
Second mid-term exam 15%  
Final Exam 40%  
Lab 20%