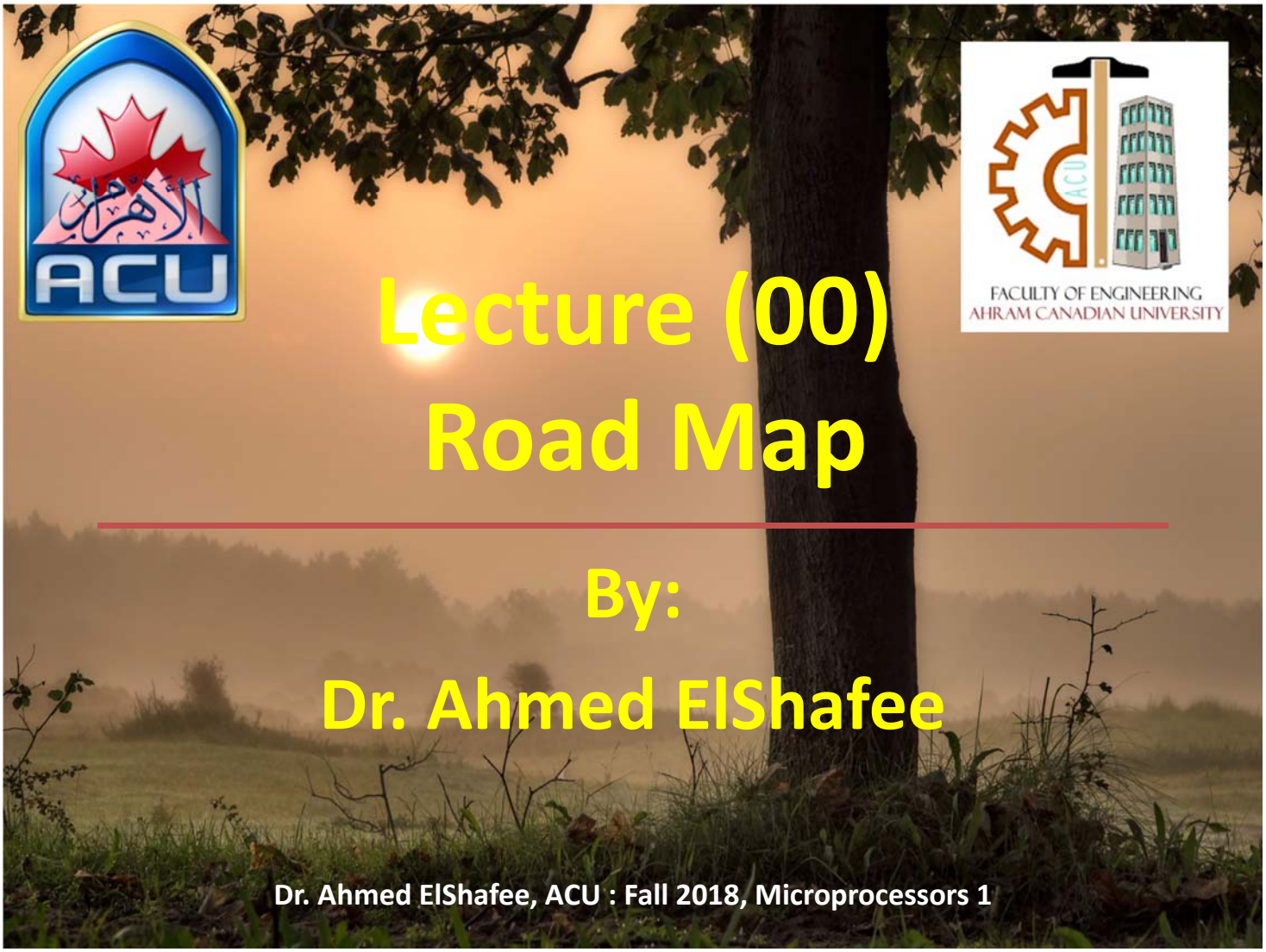

Course description

- Structure and timing of typical microprocessors.
- Sample microprocessor families.
- Memories, UARTS, timer/counters, serial devices and related devices.
- MUX and related control structures for building systems. Interrupt programming.
- Hardware/software design tradeoffs.

Course objective

By the end of this course, you should be familiar with the microprocessors and embedded systems basic architectures, features, and programming.

Learning Outcomes

After completing this course the students will gain:

- 1. Ability to understand the design and implement programs to run microprocessor systems.
- 2. Ability to design and implement hardware interfaces for microprocessor system.

TOC

- **Introduction to microprocessors**: Overview of microprocessor technologies.
- **Introduction to the x86 family**: Pin and signal descriptions, loading and timing of the 80x86 microprocessors. Bus drivers, clock and reset circuits.
- **Memory addressing modes, instructions set, assembly programming**.
- **Memory interfacing, and synchronization**: Interfacing with EPROMs, Static and Dynamic RAMs. Address decoding, memory maps and memory mirroring. Static and dynamic bus contention. Memory timing analysis, synchronization using asynchronous buses and wait states.

- **Input/Output interfacing**: Isolated and memory mapped I/O. Interfacing with two state devices such as LEDs, 7-segment displays, switches, keyboards relays and ac loads. I/O synchronization using interrupts and the polling technique. Software and hardware aspects of interrupts. Use of programmable I/O devices.
- **Analog interfacing**: Digital to analog and analog to digital converters, operation, characteristics and interfacing. Synchronization between data converters and a microprocessor. Applications of data converters.
- **Microcomputer Architecture**: Interfacing and programming of typical devices found in microcomputers such as Programmable Interface Adaptors

- **Interrupts and DMA**: Programmable Interval Timers (PIT), Programmable Interrupt Controllers (PIC) and Direct Memory Access Controllers (DMAC), and USART. Computer bus standards.

References and textbook

Title:	**THE INTEL MICROPROCESSORS,** 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-Bit Extensions **Architecture, Programming, and Interfacing**
Author:	B. Brey
Publisher:	Prentice Hall
Edition:	8th
Year	2008
ISBN:	0-13-502645-8

Grading Scheme

item	Grade
Final	40
Midterm	20
Quizzes	10
Attendance and participation	10
Projects & assignments	30


Thanks,..
Lets do this, ...
FACULTY OF ENGINEERING
AHRAM CANADIAN UNIVERSITY
Dr. Ahmed ElShafee, ACU : Fall 2018, Microprocessors 1