University of Nicosia, Cyprus

Course Code ECE-320	**Course Title** Microprocessor Interfacing	**ECTS Credits** 6
Department Engineering	**Semester** Fall or Spring	**Prerequisites** ECE-220, ECE-221
Type of Course Elective	**Field** Computer Engineering	**Language of Instruction** English
Level of Course 1st Cycle	**Year of Study** 3rd	**Lecturer(s)** Dr Stelios Neophytou
Mode of Delivery Face-to-face	**Work Placement** N/A	**Co-requisites** None

Objectives of the Course:

This course intends to give satisfactory knowledge of microprocessors interfacing in modern computer systems. It introduces standard interfacing techniques and mechanisms and explains the interface modules and I/O systems of the microprocessor. Moreover, the course describes the interfacing with standard computer system peripherals such as the memory, the monitor and the keyboard, as well as non-standard and even customized components.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Discuss the basic concept of the inter-processor communication.
- Define the memory interfacing structure for the different memory schemes and technology.
- Identify the basic interfacing devices of modern processors as well as the basic peripherals.
- Explain the interrupt mechanisms and the techniques used to identify and accommodate the interrupts.
- Define how standard I/O devices are connected and controlled to the central processor.
- Explain the operation of the DMA and the Bus interfaces.
- Explain how non-standard devices are connected using the Bus mechanism.

Course Contents:

- Overview of the basic CISC microprocessors' hardware specifications. Pin orientation and interface capabilities.
- The memory interface, address decoding. Static and dynamic RAM overview. DRAM controllers.
- The basic I/O interface. Interface with programmable parallel and serial interfaces. Usage of I/O interface and compatible devices.
- Programmable keyboard and display interface. Programmable interval timer and

usage of timing in interfacing. Interface adapters: connectivity and usage.

- The basic interrupt processing and the programmable peripheral interfaces. The interrupt-processes I/O technique. Expansion of the interrupt structure.
- Direct memory access (DMA) and control signals. Usage of DMA and performance evaluation.
- Overview of magnetic and optical disk standards. Processor - disk interfacing.
- Overview of video interface standards. Video displays and connectivity.
- The processor's bus and its importance in devices interconnections. Bus signal description and different Bus schemes (ISA, AGP, PCI, USB etc).
- Custom interfacing using the standard processor's BUS interface.

Learning Activities and Teaching Methods:

Lectures, Lab Presentations and Tutorials, Lab and Homework Assignments.

Assessment Methods:

Homework, Lab Reports, Mid-Term, Project, Final Exam.

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Barry B. Brey	The Intel Microprocessors, Architecture, Programming and Interfacing	Prentice-Hall	2008	0-13-714094-0

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
W. A. Triebel, A. Singh	The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications, 4th Edition.	Prentice Hall	2002	0130930814
A. K. Ray	Advanced Microprocessors and Peripherals, 2e: Architecture, Programming and Interfacing	McGraw-Hill	2009	0070151261