**EECE 2710 Introduction to Computer Hardware and Software**

**Credits and contact hours:** 3 credit course, meeting for 3 50-minute periods each week.

**Course coordinator:** Dr. Cristinel Ababei

**Text:** Irv Englander, The Architecture of Computer Hardware, Systems Software and Networking, 4th edition, John Wiley & Sons, 2009.

**Catalog description:** Overview of computer hardware: information representation, the control unit, implementation of instruction sets, memories and storage devices, internal bus organization, the arithmetic/logic unit, the input/output unit, interfacing peripherals. Overview of computer software, operating system components: memory management, input/output, file management, scheduling, resource management. Layered operating system design, programming languages and language translators, application layer design, software tools, and system design and design process. Programming exercises in machine and assembly language and in the JAVA programming language.

**Prerequisites:** EECE 1610 Introduction to Computer Programming orCOSC 1010 Introduction to Computer Programming.

**Required**

**Professional component:** Engineering science – 100%

**Course Goals:**

To provide all students with a broad foundation in the fundamental concepts of computer hardware and systems software.

**Specific outcomes of instruction***By the end of this course, you should....*

1. Know how numbers and other data are represented in a computer.
2. Understand the implications of selecting a particular representation for data in a computer.
3. Know the basic elements of computer hardware, including the CPU, memory, registers, buses, and I/O.
4. Understand the issues in the design of computer instruction sets.
5. Be familiar with machine language and assembly language concepts and programs, and be able to write simple programs in machine language and assembly language.
6. Understand some common enhancements to computer hardware, including virtual storage, memory enhancements, pipelining, and vector processing.
7. Be familiar with the architecture of several modern computer systems.
8. Know the fundamental elements of an operating system.
9. Know the purpose of the user interface and understand the design issues surrounding user interfaces.
10. Be familiar with the major design features of operating systems.
11. Understand the concepts of high level languages and their translators.
12. Be familiar with the elements of several modern operating systems.
13. Understand the fundamental concepts of networks and distributed computer systems.

**Student outcomes addressed by the course:**Partial fulfillment of Criterion 3 objectives A, D, E, F, G, H, I, J, and K

**Brief list of topics to be covered**

Module 1: Data Formats and Number Systems

Chapters 2 – 5

Module 2: A Simple CPU

Chapters 6 and 7; Supplementary Chapter 2;

LMC User’s Manual

Module 3: Advanced System Concepts

Chapters 8, 11, and 12

Module 4: Input/Output

Chapters 9 and 10

Module 5: Data Communication, Computer Networks

Parts of Chapters 10, 11, and 15

Module runs concurrent with Modules 3, 4, and 6

Module 6: Operating System Concepts

Chapters 13, 14, 15, and 18

Module 7: File Systems and Programming Tools

Chapters 16 and 17

Last modified: January 24, 2018