EMBRY-RIDDLE AERONAUTICAL UNIVERSITY
Department of Computing and Mathematics
COURSE OUTLINE FOR

Course No.: CS470 **Title: Computer Architecture**
Cr Hrs: 3

Lecture Hours: 3 **Laboratory Hours: 0**

COURSE DESCRIPTION:

This course describes in detail the on Neuman computer architecture which includes processors, memory, input/output, and transfer of information; examples of machine language, assembly language, microprogramming and operating system will be discussed. Additional topics in advance computer architecture and computer systems will be covered. Prerequiste: CS 225 and CEC 320

GOALS:

This course continues the study of computer organization which begun in CEC 220 & CEC 320. The student becomes familiar with common single and multiprocessor architectures in current use and learns about concepts concerned with the design and operation of various computer system components (processors, memory devices, I/O devices, etc.). The student also study the elementary features of operating systems, as they relate to computer architecture.

PERFORMANCE OBJECTIVES:

1. Illustrate the understanding of timing analysis for combinatorial and sequential circuits.

2. Understand state diagrams and state tables, and use them in understanding the operation of sequential circuits, controllers, and computer operation.

3. Understand the operation of a simple digital computer, and its peripherals such as Interrupt priority handler, and A/D converter.

4. Understand the concepts of micro programming and be able to use hardware programming language, such as Register Transfer Language (RTL), to design the computer hardware.

5. Understand the digital computer operating system concepts such as paging, virtual memory, and segmentation.

6. Understand the different parallel processing architecture (i.e. pipeline, vector processor).

7. Understand the difference between the CISC and RISC architecture.

8. Understand the basic concepts of computer networking.

Department of Computing and Mathematics
COURSE OUTLINE FOR CS470, Continued

TEXTBOOK:

Mano, M.M., *Computer System Architecture*, 3rd edition.

SUGGESTED SUPPLEMENTAL MATERIALS:

a. Floyed, Thomas L., *Digital Fundamentals*, 5th edition.
b. Hayes, John P., *Computer Architecture and Organization*, 2nd edition.

PREREQUISITE KNOWLEDGE BY TOPIC:

1.

TOPIC	CLASS HOURS	COURSE OBJECTIVES
1. Digital logic, combinational and sequential circuit	5	Review the fundumental elements of the computer and how they work and operate.
2. Processors	6	Overview of the CPU architectures and how they work.
3. Hardware programming and micro operations	7	Understanding the basic fundamental of hardware languages (i.e., RTL, AHPL) and how it is used in the design of computer. Capability to design simple component given the appropriate hardware language representation.
4. Control Units & Micro programming	7	Understanding the operation of the control unit. Understanding the fundamental of micro programming.
5. Memory organization, Memory management, and Operating System	5	Understanding the fundamental of memory organization, management, and associated issues with the operationg system, such as paging, segmentation.
6. Input/Output and peripheral devices	5	Understanding of the different peripheral devices and their corresponding interfaces. Understanding the fundamental of interrupts, interrupt priority, and interrupt handeling.
7. Advanced Computer Architecture	6	Understanding the fundamental of advance computer architecture, such as parallel architectures. Special emphesis is given to pipeline architecture, RICS machines, and vector processors.
8. Computer Networking	3	Basic understanding of network topologies and protocals

LABORATORY:

No laboratory equipment is required.

COMPUTER USAGE:

There is no special computer usage required.

GRADING SYSTEM:

3 exams	90%
Homework & Quizzes	10%

Homework assignment from the textbook will be collected for grading. There will be announced and unannounced quizzes, which will cover the material previously covered in class. The three exams will measure the mastery of the material by students.

ESTIMATED CONTENT:

Skills:	**20%**
Content:	**80%**