ENGR460 – COMPUTING SYSTEMS: ORGANIZATION AND DESIGN
(FALL 2006)

INSTRUCTOR: Claudio Talarico
OFFICE: CEB (Computer & Engineering Bldg.), Room 336
OFFICE HOURS: MW 10:00 am - 1:00 pm and by appointment.
PHONE: (509) 359–4780
e-mail: claudio.talarico@mail.ewu.edu
COURSE URL: http://www.ewu.edu/x30360.xml

CLASS LOCATION AND SCHEDULE:
MW 13:00-14:40, CEB 106

COURSE DESCRIPTION:
The aim of this course is to provide students with the theoretical and practical knowledge required for analyzing and designing complex computing systems. Emphasis is on the impact that the organization and interfacing of hardware/software components have on system performance.

LEARNING OBJECTIVES:
Upon completion of this course, students will be able to:
1. Explain the role of abstraction in the design of large digital systems, and explain the major software and hardware abstractions in contemporary computer systems (ABET 3c, 3j).
2. Design the architecture and organization of the basic components of a computer system (ABET 3e).
3. Analyze the performance of computing systems using measures such as latency and throughput (ABET 3a).
4. Use probabilistic and statistical methods to evaluate the performance of software and/or hardware systems (ABET 3a).
5. Enhance a computer system by modifying its software and hardware components after evaluating the interaction between them (ABET 3e).
6. Design the logic circuits that form the basic building blocks of a computer system using HDLs (ABET 3a, 3c).
7. Design, implement, evaluate and verify the operation of digital systems (ABET 3a, 3c).
8. Model a simple pipelined CPU with a given RISC-based instruction set at the register transfer level. (ABET 3j, 3k)
9. Demonstrate independent learning by using unfamiliar software tools to design, evaluate and verify digital computing systems (ABET 3i, 3k).
10. Model and evaluate memory hierarchy and organization (ABET 3a)

TEXTBOOK:

PREREQUISITES:
ENGR 260 (Microprocessors), CSCD 255(C Programming for Engineers) or consent of the instructor.
**GRADING:**

Homework: 20%
Midterm: 20%
Final Exam: 20%
Project: 40%

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Late work will **NOT** be accepted.

**COURSE CONTENTS:**

- Computer Abstractions and Technology
- Assessing and Understanding Performance
- Instructions: Language of the Computer
- Arithmetic of the Computer
- Basic of logic design and ALU
- Hardware Description Languages and Logic Synthesis
- The Processor Data-path and Control
- Enhancing Performance with Pipelining
- Memory Hierarchy