

COURSE DESCRIPTION

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| Dept., Number | CS 3320 Selected Elective | Course Title | Computer Architecture II: Advanced Computer Design and Implementation |
| Semester hours | 45 hours | Course Coordinator | Patricia Teller |

Current Catalog Description

The organization and structure of the major hardware components of computers; the mechanics of information transfer and control within digital computer systems.

Textbook:

Computer Organization and Design - The Hardware / Software Interface, Fourth Edition, David A. Patterson and John L. Hennessy (Morgan Kaufmann)

Course Outcomes:

Level 1: Knowledge and Comprehension

Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. The material has been presented only at a superficial level.

Upon successful completion of this course, students will be able to:

- 1a. Explain the representation of floating-point numbers.
- 1b. Define virtual memory.
- 1c. Discuss interfacing processors and peripherals.
- 1d. Understand multiprocessor systems

Level 2: Application and Analysis

Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details.

Upon successful completion of this course, students will be able to:

- 2a. Apply knowledge of arithmetic algorithms and real-time scheduling.
- 2b. Analyze cache design.
- 2c. Examine representation of integer numbers.

Level 3: Synthesis and Evaluation

Level 3 outcomes are those in which the student can apply the material in new situations.

This is the highest level of mastery.

Upon successful completion of this course, students will be able to:

- 3a. Evaluate computer performance in terms of space and time tradeoffs.
- 3b. Evaluate instruction set architecture design and implementation.
- 3c. Construct data path and control mechanisms used in processor implementations.
- 3d. Propose processor implementation alternatives (single-cycle, multiple-cycle, and pipelined implementations) for a particular situation.
- 3e. Prepare memory hierarchy design given certain requirements.

Student Outcomes

Student Outcomes: 1, 2, 3, 10

Prerequisites by Topic

CS 3432 and EE 2369, each with a grade of "C" or better.