

ECE 375 – Computer Organization and Assembly Language Programming

Catalog Description: Introduction to computer organization, how major components in a computer system function together in executing a program, and assembly language programming.

Credits: 4 **Terms Offered:** Fall, Winter

Prerequisites: ECE 271 and C/C++ programming (e.g., CS 261)

Courses that require this as a prerequisite: CS/ECE 372, ECE 441, ECE 471, CS/ECE 472, ECE 473, ECE 474, ECE 477

Structure: Three 50-minute lectures or two 80-minute lectures per week, plus one 2-hour lab per week

Instructors: Ben Lee

Course Content:

- Introduction to Computer Organization and Assembly Language
- Register transfer and micro-operations
- Microprocessor organization and programming, including instruction sets, I/O, and interrupts
- Digital components and data representation
- Basic datapath and control unit design; single-cycle and multi-cycle implementation
- Arithmetic and Logic Unit

Measurable Student Learning Outcomes:

At the completion of the course, students will be able to...

1. **Identify** major components and their interactions in computer architecture (ABET outcomes: A, e, i, k)
2. **Program** in assembly language (ABET outcomes: A, C, D, E, g, k, m)
3. **Implement** algorithms for computer arithmetic (ABET outcomes: A, C, K, m, n)
4. **Compare** different instruction set architectures (ABET outcomes: i, j)
5. **Design** input/output for embedded processors (ABET outcomes: A, C, E, k)
6. **Perform** laboratory experiments using the above concepts (ABET outcomes: A, B, m)

Learning Resources:

- *Computer Organization and Assembly Language Programming: Embedded Systems Perspective (in-progress)*, Ben Lee (required).
- ATmega 128 Datasheet

Students with Disabilities:

Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the

term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

Link to Statement of Expectations for Student Conduct:

<http://oregonstate.edu/admin/stucon/achon.htm>

Revised: 10/08/08

Revised Learning Resources: 10/01/14