CS-271
Computer Architecture & Assembly
Course Syllabus

Course Description
An introduction to the organization of a digital computer. Covers historical development, number systems, data encoding, Boolean and digital logic fundamentals, processor components, instruction execution and addressing. Presents an introduction to Assembler language program and the Assembler process, RISC machines, and parallel architectures.

Required Text/Materials
Thomas Clements, Computer Organization and Architecture: Themes and Variations, Cengage Learning

Online/Digital class materials can be found on eLearn or my faculty site: http://elearn.chemeketa.edu
http://faculty.chemeketa.edu/ascholer/

Prerequisites
Grade of C or higher in MTH 111 or equivalent, and completion of CS160 and CS161.

Performance Based Learner Outcomes
Upon successful completion of the class, students should be able to:

• Identify the major components of a computer architecture, and explain their purposes and interactions.
• Create and simplify simple logic circuits.
• Explain how data types such as integers, characters, floating point numbers, arrays, pointers, and structures are represented.
• Explain the relationships between a hardware architecture and its instruction set.
• Describe the performance impact of hardware features such as pipelining, and architecture principles such as memory locality.
• Explain various mechanisms for implementing parallelism.
• Explain how high-level programming constructs such as loops and stack-based function calls are implemented in underlying machine code.
• Write modularized computer programs in an assembly language, implementing decision, repetition, and procedure structures.
• Describe the process of assembling and linking and the function of object/executable files and shared libraries; build assembly programs using basic system tools.
• Use a debugger, and explain register contents.

Primary Teaching Method
Interactive lecture, discussion, demonstrations and in-class programming are used to explore computer science and computer architecture concepts.
Situations may arise that through Disability Services should phone 503.399.5192, e-mail disability@chemeketa.edu, or go to the office in Building 2.

ADA
Accommodations are collaborative efforts between students, faculty, and Disability Services. If you have already been approved for accommodations and requested them for this term, both you and I receive a Letter of Accommodation by e-mail. It is important that we discuss the accommodations as early in the term as possible. Students who believe they are eligible for accommodations but who have not yet obtained approval through Disability Services should phone 503.399.5192, e-mail disability@chemeketa.edu, or go to the office in Building 2.

Diversity Values
We are a college community enriched by the diversity of our students and staff. Each individual and group has the potential to contribute in our learning environment. Each has dignity. To diminish the dignity of one is to diminish the dignity of us all.

Affirmative Action
It is the policy of Chemeketa Community College and its Board that there will be no discrimination or harassment on the basis of race, religion, color, sex, age, national origin, ethnic origin, sexual orientation, gender identity, marital status, citizenship status, pregnancy and related conditions, family relationship, veteran’s status, disabilities and tobacco usage in any educational programs, activities or employment. Persons having questions about equal opportunity/affirmative action should contact the Affirmative Action Officer at 4000 Lancaster Dr. NE, Salem, Oregon 97309-7070, or call 503.399.4784. To request this publication in an alternative format, please call 503.399.5192.

Academic Honesty
The presentation of another individual's work as one’s own or the act of seeking unfair academic advantage through cheating, plagiarism or other dishonest means are violations of the college’s “Students Rights and Responsibilities.” See the College catalog or public website for definitions and violation penalties - http://www.chemeketa.edu/aboutchemeketa/collegelife/honesty/policy.html.

Course Requirements
- Exams must be taken at the times and dates scheduled. There will be no makeup or retake exams. If you must miss an exam due to a REAL emergency, contact me (phone or email) PRIOR to the exam time.

Grading/Policies

<table>
<thead>
<tr>
<th>Components</th>
<th>Grade Scale</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>40%</td>
<td>A = 90-100% B = 80-89% C = 70-79% D = 60-69% F = Below 60%</td>
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<tr>
<td>Exams</td>
<td>35%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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See the “Class Policies & Student Tips” page for more details on Assignments, Exam grading and points. Note that all assignments are equally weighted as are all exams.

Incompletes
Incompletes will only be given for students who have satisfactorily completed most of the course work and are unable to finish the course due to an extenuating circumstance beyond their control. Examples include: extended family leave approved by the College, validated personal illness requiring an extended hospital stay, a death in the immediate family or military leave.

Important Dates/Assignment Outline (visit the class web site for topic schedule)

<table>
<thead>
<tr>
<th>Week</th>
<th>Notes</th>
<th>Assignments Due</th>
<th>Exams</th>
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<tbody>
<tr>
<td>1</td>
<td>Data Representation &amp; ARM Basics</td>
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<td>2</td>
<td>Boolean Logic &amp; Gates; ARM Memory</td>
<td>Tue - A1</td>
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<td>3</td>
<td>Circuits; ARM Control Structures</td>
<td>Tue - A2</td>
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<td>4</td>
<td>Organization Basics; ARM arrays/strings</td>
<td>Tue - A3</td>
<td>Exam 1</td>
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<td>5</td>
<td>Architecture Basics; Assembly Functions</td>
<td>Tue - A4</td>
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<td>6</td>
<td>Stack Frames; Performance</td>
<td>Tue - A5</td>
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<td>7</td>
<td>Pipelining; Command Lines Tools</td>
<td>Tue - A6</td>
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<td>8</td>
<td>Instruction Parallelism</td>
<td>Tue - A7</td>
<td>Exam 2</td>
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<td>9</td>
<td>Memory; Floating Point; Linking C &amp; assembly</td>
<td>Tue - A8</td>
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<tr>
<td>10</td>
<td>Process Parallelism; Compilers &amp; assembly</td>
<td>Tue - A8</td>
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<tr>
<td>FINALS</td>
<td>See schedule of classes for final date/time</td>
<td>Tue – A10</td>
<td>Final</td>
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Course Notes
- I have an open-door policy; if I am in the office and not occupied with class preparation, I will be glad to see you. If possible please make an appointment to make sure I will be available.
- READ THE STUDENT TIPS FILE on eLearn (or my class web site) for more detailed policies and tips.
- Please review Chemeketa’s Students Rights and Responsibilities, and the campus policy on plagiarism.
- The syllabus is a guideline to this course, it is not a legal contract. Situations may arise that could require modifications to this guide.