Welcome to CS 286!

Instructor: Dr. Hiroshi Fujinoki  
Office: EB 2034  
Email: hfujino@siue.edu  
URL: www.siue.edu/~hfujino  
Office Phone: (618) 650-3727

Office Hours: (1) Monday: 1:30 - 3:30 P.M.
(2) Tuesday: 10:00 - 11:00 A.M.
(3) Tuesday: 2:00 - 3:30 P.M.
(3) Wednesday: 1:30 - 3:30 P.M.
(4) Thursday: by appointment
(4) Friday: by appointment

Note1: The above office hours will not be applied to the final exam week. During the final exam, please contact Dr. Fujinoki for your appointment.

Class Meeting Room: EB-1033  
Class Meeting Days: Monday, Wednesday, and Friday  
Class Meeting Time: 9:00-9:50 A.M.

Note: item with "★" symbol means an important item.

★ Course Prerequisites:

CS150 (Introduction to Computing II) with a minimum grade of C or the instructor's permission. If you have not completed CS150, please talk to the instructor.

★ Grading:

<table>
<thead>
<tr>
<th></th>
<th>Weight</th>
<th>Final Letter Grade</th>
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</thead>
<tbody>
<tr>
<td>Lecture Attendance</td>
<td>16%</td>
<td>100-92: A</td>
</tr>
<tr>
<td>Programming assignments</td>
<td>15%</td>
<td>91-82: B</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>29%</td>
<td>81-72: C</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
<td>71-62: D</td>
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<tr>
<td></td>
<td></td>
<td>Below 62: F</td>
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Exams:
- Exams will be closed textbook and closed notes.
- Makeup exam will be given only for medical emergency (with a signed doctor’s letter). Makeups for any other reasons will not be provided (no exception).
- Absence from an exam will result in zero point for the exam (except medical emergencies).
- A calculator is allowed in the exams (however sharing a calculator during an exam is NOT allowed – everyone needs to bring your own calculator).
- Exams will cover reading assignments and required exercise questions.
- Any error regarding your graded exams should be reported to Dr. Fujinoki within two weeks (14 calendar days) after your attendance status is posted to the course web site.

Course Projects:
- Programming projects using assembly language for MIPS R3000 Processor (we use MIPS R3000 emulator).
- Course programming projects are all individual project (no collaboration is allowed either for designs and coding).
- The project specifications will be provided in the class.

Attendance Policy:
- Attendance will be taken at the beginning of lectures (being late more than 5 minutes may be considered absence).
- An attendance card will be provided to each person who attends a lecture. At the end of a lecture, each of you should return your attendance card with your SIUE ID written on the card. The attendance card should be the one provided by the course instructor or the teaching assistant for this course. Returning an attendance card that is NOT provided by either the course instructor or the teaching assistant will be considered as an act of cheating. For the first time a person violates this rule, that person will receive a warning (and it will be considered as an absence). The second time the same person violates this rule, the person will not earn any credit for attendance for the whole semester (-16 points from your course grade).
- No penalty will be given up to three absences in a semester. For each absence beyond the third absence, -2 point penalty (in 100 scale) will be given to your course grade.
- The above penalty will not apply to your medical emergency (however, you need to provide a written proof of medical service to waive the penalty).
- Any error regarding your class attendance status should be reported to Dr. Fujinoki within two weeks (14 calendar days) after your attendance status is posted to the course web site.
**Academic Dishonesty:**

Following activities (but not limited to them) will be considered academic dishonesty:

I. Exams:
   (a) Watching and copying your neighbors' solutions during exams.
   (b) Using materials not allowed during exams.
   (c) Anyone committing academic misconduct above (I-(a) or (b)) will receive a failing grade for this course and reported to the department chair as well as to the dean of the school of engineering.

II. Programming Projects:
   (a) Submitting work totally or partially done by somebody else (this includes any human/electronic sources (such as web sites and even another course at SIUE)).
   (b) Submitting program source code files (for the programming projects) that are developed by collaborations with other people. This includes both program designs and implementations.
   (c) Anyone committing academic misconduct above (II-(a) or (b)) will receive a grade of zero on the assignment plus a warning for the first infraction. Anyone committing a second infraction will automatically fail the course and/or be brought up on charges of academic misconduct, which may result in expulsion from the university.

**Required Textbook:**

- The lecture notes and the PPT slides presented in the classroom are summaries of the course textbook. The course syllabus specifies the textbook chapters/sections each student should read ideally before each lecture (at least after each lecture).

**Other Requirements for this Course:**

- Experience with C/C++ (UNIX environment)
- Data structure or discrete structure
Disability Support:

- Students who believe they may need accommodations in this class are encouraged to contact the office of Disability Support Services as soon as possible. It is the students’ responsibility to alert the instructor to SIUE sanctioned accommodations. If anyone needs assistance from SIUE Disability Support Services, please contact them.

Other Notices:

- This course expects each of you to work at least nine (9) hours other than attending lectures (this is also a policy of SIUE).
- Important announcements will be made at the beginning of a lecture.
- If you are absent from a lecture, it is your responsibility to find the announcements and the contents in the missed lecture (you are suggested to talk to your classmates).
- Each of you is expected to check "Weekly Notices" in the web site of this course (you can reach the course web site from http://www.siue.edu/~hfujino) at least once in a week. The decisions regarding which course materials are posted belong to the course instructor. If any promised course material is missing in the course home, it is your responsibility to request such material to the course instructor.
- Any grading problem should be reported within two weeks (14 days) after their grades are posted or the graded materials are returned in the classroom.
- Any electric device, such as smart phone, laptop PC, and tablet computer (except a calculator), should not be used during lectures and exams.
- E-mails sent to the course instructor during weekends and the break (spring break) may not be responded.
Tentative Class Schedule (subject to change):

This schedule is tentative and subject to change. However, any change will be announced in the class or noticed in the notice page of the instructor.

Week #: Day | Topics | Reading Assignments
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**Week 1:** August 19 (M): Introduction to CS286  
August 21 (W): Computer Abstractions  
August 23 (F): The Role of Performance | Chapter 1 (1.1 through 1.5)  
Chapter 2 (2.1 through 2.6) |
**Week 2:** August 26 (M): Introduction to Assembly Languages (1)  
August 28 (W): Introduction to Assembly Languages (2)  
August 30 (F): Assembly Language using MIPS CPU  
Programming project description  
Project Phase #1 Assigned | Chapter 3 (3.1 through 3.4)  
Chapter 3 (3.1 through 3.4)  
Chapter 3 (3.1 through 3.4)  
Handout |
**Week 3:** September 2 (M): Labor Day Holiday. University closed  
September 4 (W): Program Control Structure  
September 6 (F): Arithmetic for Computers (1) | Chapter 3 (3.5 and 3.6)  
Chapter 4 (4.1 through 4.6) |
**Week 4:** September 9 (M): Arithmetic for Computers (2)  
September 11 (W): Data Path and Control (1)  
September 13 (F): Data Path and Control (2) | Chapter 4 (4.7 and 4.8)  
Chapter 5 (5.1 and 5.2)  
Chapter 5 (5.1 and 5.2) |
**Week 5:** September 16 (M): Programming Project #2 discussions  
September 18 (W): Programming Project #2 discussions  
September 20 (F): Pipeline Data Path (1)  
Project Phase #1 Due | (1) Handout  
(2) Handout  
Chapter 6 (6.1 through 6.3) |
**Week 6:** September 23 (M): Pipeline Data Path (2)  
Project #2 Assigned  
September 25 (W): Pipeline Data Path (3)  
September 27 (F): Pipeline Hazards and code optimization (1) | Chapter 6 (6.1 through 6.3)  
Chapter 6 (6.1 through 6.3)  
Chapter 6 (6.4 through 6.6) |
**Week 7:** September 30 (M): Pipeline Hazards and code optimization (2)  
October 2 (W): Pipeline Hazards and code optimization (3)  
October 4 (F): Pipeline Hazards and code optimization (4) | Chapter 6 (6.4 through 6.6)  
Chapter 6 (6.4 through 6.6)  
Chapter 6 (6.4 through 6.6) |
**Week 8:** October 7 (M): Memory sub-system (1)  
October 9 (W): Midterm Exam Review  
October 11 (F): Midterm Exam | Chapter 7 (7.1 through 7.2) |
**Week 9:** October 14 (M): Memory basics and memory hierarchy  
October 16 (W): Virtual Memory  
October 18 (F): Memory Segmentation | Chapter 7 (7.1 through 7.2)  
Chapter 7 (7.4)  
Chapter 7 (7.4) |
Week 10: October 21 (M): Programming Project #3 discussions
Project #2 Due
October 23 (W): Programming Project #3 discussions
Project #3 Assigned
October 25 (F): Cache Performance analysis
(1) Handout

Week 11: October 28 (M): Cache Performance analysis
October 30 (W): I/O Subsystems (1)
November 1 (F): I/O Subsystems (2)
(2) Handout

Week 12: November 4 (M): I/O Subsystems (3)
November 6 (W): I/O Subsystems (4)
November 8 (F): Multi-processor System (1)
Chapter 7 (7.3)

Week 13: November 11 (M): Multi-processor System (2)
November 13 (W): Multi-processor System: Hyper-Threading
November 15 (F): NUMA and UMA memory architecture
Chapter 8 (8.1 through 8.3)

Week 14: November 18 (M): Reliability of Hardware Components
November 20 (W): Capacity Analysis: Queuing Theory, Project #3 Due
November 22 (F): Topic TBA

Week 15: November 25 - December 1: Thanksgiving Break. Classes not in session.

Week 16: December 2 (W): Topic TBA
December 4 (W): Final Exam Review (1)
December 6 (F): Final Exam Review (2)

Week 17: Final Exam Week
December 12 (Thursday) at 8:00-9:40 A.M.: Final Exam (comprehensive)

The list of the reading assignment is the minimum requirement. It is expected that each student voluntarily studies not only the required sections but other related sections or materials to maximize the learning during the semester.

Required reading should be done before the lecture.

If you have any problem for the above schedule, please contact to Dr. Fujinoki as soon as possible.

Any question regarding this syllabus should be addressed to: hfujino@siue.edu

Course syllabus last modified at 3:12 P.M., August 16, 2019