CST 337 Computer Architecture
Spring 2019

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Course Description
This course is designed to provide students with the fundamental knowledge of computer architectures, hardware and software components of computer systems, and functionalities of low-level computer programming languages. Coverage includes introduction to computer systems, data representation, CPU, memory, input/output devices, machine language, assembly, pipelining, parallelism, and redundancy.

Prerequisites
CST 231, MATH 170

Materials

Textbook Required:
COMPUTER ORGANIZATION AND DESIGN: THE HARDWARE/SOFTWARE INTERFACE
5th Edition, by David Patterson and John Hennessy

Group Project Hardware Required:
The group project will require students to purchase/acquire hardware. The extent of the hardware purchase is dependent on the group project, however in most cases the project will cost the group in the range of $50-$75.

Purchases will include: Arduino OR Raspberry Pi
Purchases may include: hardware components such as sensors, breadboards, motors, etc…
Lab Hardware
The course will provide Arduino kits for in class group labs. These kits are used to expose students to solutioning with hardware. On a case by case basis, kits may be borrowed for short periods of time. The kits are not to be used for the Group Project.

Technical Requirements
Students are expected to bring their laptops/tablets to class. Individual participation exercises and quizzes will be held in class utilizing iLearn.
In order to access iLearn, please ensure that your computer has the following recommended minimum browsers: Google Chrome 11, Firefox 4, Safari 5, or Internet Explorer 10.

Learning Outcomes
At the end of the course, students will have the following knowledge and skill outcomes.

Knowledge outcomes
1. Articulate the various milestones in the history and evolution of computing.
2. Describe the fundamental components of computer systems and how they are organized.
3. Describe how data is represented in computers and how it is referenced at the high level programming, assembly, and machine levels.
4. Describe how the various components of a computer are interfaced and how they communicate with each other.
5. Describe how software is executed on hardware and how the various components of a computer play a role in a software program's execution.

Skills/Abilities outcomes
1. Proficiency with the C Programming Language
2. Proficiency with the MIPS Assembly Programming Language
3. Proficiency with designing Digital Logic Circuits in a simulator

Attendance
For you to be successful in this class you will need to attend the class. Attendance will be taken everyday. If you miss class more than 3 times without approval from the instructor, you will forfeit any and all extra credit. Bottom line, let the instructor know if you will be late or miss class in advance. Excusing students from class for any reason is at the instructor's sole discretion and approval.

Attendance Taking
Each student will be given an attendance card at the beginning of the course. Students will drop off their attendance card at the beginning of each class and recover it at the end of the class. Attendance will be marked based on the presence of an attendance card.
Key Points

- In all cases where students have neglected to attend class consistently, they have consistently failed this class
- If you want extra credit, show up for class

Reading

Chapter/sections for reading assignment are posted on iLearn. Students need to read the chapter and identify/comprehend the new ideas, concepts, and be able to clearly explain them to classmates.

Following through on reading will significantly affect student performance in discussions, quizzes, assignments, labs, and exams.

Key Points

- Reading is posted on iLearn for every module and section
- Students are expected to do the reading before class to facilitate the lectures

Assignments

An assignment receives no credit if it is late. If the amount of time allotted for an assignment is not enough, it should be brought up for discussion or to the attention of the professor before the assignment is due.

All assignments will be submitted in PDF format.

Following through on assignments will significantly affect student performance in discussions, quizzes, assignments, labs, and exams.

Gradescope

Students will submit their assignments via Gradescope. Students will be enrolled by the instructor at the beginning of the class. Please contact the instructor if you have not been enrolled.

Information on how to use Gradescope to submit your assignments can be found here:

https://www.gradescope.com/help#help-center-section-student-workflow

Key Points

- All assignments will be submitted in PDF format
- Students should expect 2-8 hours of homework/assignments work per week
- All assignments for the week are due Sunday at 11:55:00 PM
- If assignment is late by one second, then it is too late to be turned in
- Read the previous bullet again until you understand there are no late assignments allowed
- If you ask for an extension for an assignment, you will not be granted one
Labs
A lab assignment receives no credit if it is late. Lab assignments will likely need to be completed outside of the time allotted for the lab.
Some lab assignments will require teams. Teams will need to self-organize and finish labs outside of class if they are unable to complete them in the class time allotted.
Lab assignments will be submitted in PDF format.

Gradescope
Just as with assignments above, students will use Gradescope to turn in their lab assignments. See the Assignment Gradescope section above.

Key Points
- All lab assignments will be submitted in PDF format
- All lab assignments for the week are due Sunday at 11:55:00 PM
- If a lab assignment is late by one second, then it is too late to be turned in
- Read the previous bullet again until you understand there are no late lab assignments allowed
- If you ask for an extension for a lab assignment, you will not be granted one

Quizzes
Quizzes will be held each week throughout the semester. Quizzes test the students knowledge of the materials from the section prior. There are no makeups for quizzes if you fail to turn it in or take them on time.
Any allowance for makeups of quizzes are on a case by case basis at the sole discretion of the instructor.

Key Points:
- Quizzes are held weekly on Tuesday
- Quizzes cover the materials from the week prior
- Make up quizzes are not allowed without instructor review and approval

Exams
There will be 2 exams, splitting the class roughly into halves. Each exam may be accumulative, in that may cover both old and new materials. Exams consist of an online and a written portion, where the online portion accounts for 25% and the written portion accounts for 75% of the total exam grade.
You have one week from the exam hand-back day to address any grading issues. No makeups for exams if you fail to turn it in or take it on time.
Key Points:

- **2 exams throughout the semester**
- **Exams consist of an online (25%) and a written (75%) component**
- **Make up exams are not allowed without a proper documented excuse**

**Class Project**

Students will work in groups on an open-ended and self-driven project to design, build, and implement some hardware solution. This is an opportunity for students to choose what they want to work on. The only limitation is that the project concept has to have some tie-ins with the subject matter of the course. To this end, the student must prepare a proposal for the project and receive professor approval. The report and presentation is due at the end of the semester.

**Key Points**

- **Students will complete on an open ended group hardware project**
- **There will be multiple check points throughout the year with required project proposals and documentation**

**Extra Credit**

Extra credit will be earned by those students who show they are actively working toward learning the materials. This can take the form working through online participation exercises, in class participation and thought leadership. If you want the extra credit, you will need to show the instructor. The instructor may withhold extra credit at any time for any reason. This includes but is not limited failure to: attend, complete homework, participate with the group, etc.

**Teaching Modality**

- 2-4 hours of lecture each week
- 2-3 hours of labs each week
- 6-8 hours of reading, study, and assignments each week
- Supplemental video lectures and materials as available

**Course Web Site**

[http://ilearn.csumb.edu/](http://ilearn.csumb.edu/)

All course information and announcements will be communicated on the [iLearn](http://ilearn.csumb.edu/) site. It is the student’s responsibility to check this site frequently and to be familiar with the site and mechanics.

[http://www.gradescope.com](http://www.gradescope.com)

Assignment grading will occur on the Gradescope site. Students will submit and review their assignments on the Gradescope site. Grades will be tracked on the iLearn site.
Course Communication
The iLearn forums are the primary vehicle for all course related communications.
• The “News from Mike” forum will be used for class wide communications from the Instructor or TA.
• The “Q&A Forum” is to be used for student communications related to the course material. All of these forums are moderated by the Instructor and the TA.
• Please be respectful to one another at all times. Abuse of the forums or disrespectful communication within the forums will not be tolerated.

Personal Communication
Any personal or private information that is needed to be communicated with the instructor should be handled over email to the instructor directly. **DO NOT POST PERSONAL INFORMATION IN THE FORUMS.** Examples of communication of this nature are: planned absences, questions regarding your current course standings, concerns regarding grading on specific pieces of work, etc...
## Course Scoring

<table>
<thead>
<tr>
<th>Component</th>
<th>Score</th>
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<tbody>
<tr>
<td>Final</td>
<td>200</td>
</tr>
<tr>
<td>Midterm</td>
<td>200</td>
</tr>
<tr>
<td>Quizzes</td>
<td>150</td>
</tr>
<tr>
<td>Labs</td>
<td>150</td>
</tr>
<tr>
<td>Assignments</td>
<td>150</td>
</tr>
<tr>
<td>Team Final Project</td>
<td>150</td>
</tr>
<tr>
<td>Effort and Participation (Extra credit) *</td>
<td>50</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>1000</strong></td>
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*Extra credit will be provided at the instructor's discretion

## Grading

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<thead>
<tr>
<th>Grade</th>
<th>Score</th>
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<tbody>
<tr>
<td>A+</td>
<td>960 or Above</td>
</tr>
<tr>
<td>A</td>
<td>930-959</td>
</tr>
<tr>
<td>A-</td>
<td>900-929</td>
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<tr>
<td>B+</td>
<td>860-899</td>
</tr>
<tr>
<td>B</td>
<td>830-859</td>
</tr>
<tr>
<td>B-</td>
<td>800-829</td>
</tr>
<tr>
<td>C+</td>
<td>760-799</td>
</tr>
<tr>
<td>C</td>
<td>700-759</td>
</tr>
<tr>
<td>D*</td>
<td>600-699</td>
</tr>
<tr>
<td>F</td>
<td>599 or below</td>
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*In the CSUMB Computer Science Department D grades do not fulfill learning outcome or prerequisites
Academic Integrity

By accepting admission to California State University Monterey Bay, each student has made a commitment to understand, support, and abide by the University policies without compromise and exception. The code and policies are available in the Student Handbook and on the web at https://csumb.edu/policy. Every student is responsible for reading and understanding the Academic Integrity policy.

It is expected that each student has done the work they turn in. That is not to say one student cannot get help from another student, an instructor or any other person. However, there is a clear difference between getting help and having someone else do a student’s work. Unless specifically authorized by a class instructor, all of the following uses of a computer are violations of the University’s guidelines for academic honesty and are punishable as acts of plagiarism:

- Copying a computer file that contains another student’s assignment and submitting it as your own work.
- Copying a computer file that contains another student’s assignment and using it as a model for your own assignment.
- Working together on an assignment, sharing computer files or programs involved, and then submitting individual copies of the assignment as your own work.
- Knowingly allowing another student to copy or use one of your computer files and to submit that file, or a medication thereof, as their individual work.
- Plagiarism—representing the work of others as your own, by not properly citing all sources (be especially careful of materials copied from the web).
- Duplicating or distributing copies of copyrighted software programs, music, videos, images or other media—except as allowed by legal fair use standards in education.

Every student is expected to do his/her own work on individual assignments. Any evidence to the contrary for individual assignments will result in a grade of 0 (zero) and a report will be filed with the Department of Judicial Affairs. CSUMB’s policies regarding student discipline and judicial affairs may be found at: https://csumb.edu/judicialaffairs

CSUMB has tools and methods for detecting breaches of academic integrity. Students will be caught, and the penalties will be severe. Penalties may include and are not limited to:

- A ZERO for the assignment
- An F in the course
- A letter in your university record documenting the incidence of cheating
- Expulsion from the University
University Sponsored Activities

Students who participate in university sponsored activities (such as sports) must inform the instructor at the beginning of the course of activities that will prevent the student from attending class. Excusing students from class for any reason is at the instructor’s sole discretion and approval.

Students must provide at least two weeks notice to the instructor prior to any event that will interfere with an established quiz, exam or presentation. Allowing alternate testing or presentation arrangements for any reason is at the sole discretion and approval of the instructor.

Disabilities and Learning Assistance

Your instructor wants every student to succeed. Students requiring accommodations such as time extensions or test accommodations must present verification from Student Disability Resources as soon as possible.

Meet with SDR professional staff to register yourself at:
- In Person: Building 47, Student Services, First Floor
- By Phone: 831/582-3672 voice, or 582-4024 fax/TTY
- Email: Student_Disability_Resources@csumb.edu
- Website: https://csumb.edu/sdr

Please schedule an appointment to discuss specifics with your instructor if a disability may impact your performance in this class.

Sexual Misconduct, Dating and Domestic Violence, and Stalking

CSUMB is committed to creating and sustaining an environment free of sexual misconduct, dating and domestic violence, and stalking. If you experience any of these forms of misconduct, CSUMB encourages you to utilize the resources described below.

To report any type of misconduct:

UNIVERSITY POLICE DEPARTMENT
- Emergencies: 911
- Non-emergencies: 831-655-0268

TITLE IX: DISCRIMINATION, HARASSMENT, AND RETALIATION
- Call: 831-582-3510
- Email: wensmith@csumb.edu
  Email is recommended for fastest response

For confidential support:

CAMPUS ADVOCATE/MONTEREY COUNTY RAPE CRISIS CENTER
Confidentiality

Any CSUMB staff or faculty members, other than the campus advocate or PGCC counselors, who are told about student experiences of misconduct must report information to the Title IX office. Only PGCC and campus advocate staff can keep such information confidential.

If you tell your instructor about a student experience of misconduct, they will report it.

Course Policies

Everyone is expected to adhere to the following rules:
1. Show up to class
2. Complete and submit assignments on time
3. Practice academic integrity
4. Act respectfully toward classmates and instructor
5. Participate in class discussions

Questions/Comments

Any questions or comments in this regard should be brought to the attention of the instructor.