CSCI/CMPE 2333.01: Computer Organization and Assembly Language

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Fall 2018

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Class Hours: MW: 10:50-12:05 Office Hours: TR 3:00pm-4:00pm
Class Room: EENGR 1.250 Office: EENGR 3.327

Textbooks

- Assembly Language for x86 Processors, 7th Ed., by Kip R. Irvine, ISBN 978-0-13-376940-1 (Required)
- Computer Organization and Architecture: Designing for Performance, 9th Ed., by William Stallings, ISBN 978-0-13-293633-0 (Recommended)

Objectives

This course is intended to provide the student with an introduction to computer organization and assembly language programming. Its purpose is to provide the student with a better understanding of the internal operation of the computer.

Prerequisites

This course part of the required sequence of introductory Computer Science and Computer Engineering courses. Students are expected to have successfully completed CSCI/CMPE 1370, or have the consent of the instructor. **(If you do not meet these requirements, you will be dropped from the course.)** This course must be successfully completed (with a grade of 'C' or better) to continue the course of studies in Computer Science.

Grading Policy

- **40%** of your grade will be determined by 2 major exams during normal class hours.
- **20%** of your grade will be determined by assignments (in-class or at home) and quizzes
- **20%** of your grade will be determined by programming assignments
- **20%** of your grade will be determined by a final exam.

Assignments

There will be about 5-6 programs assigned. These are expected to be organized and well documented. The specific details for grading and documentation will be given at the time of the first program assignment.

Assignments will be graded on correctness, quality, and style. You MUST submit ALL homework/programming projects, with no exceptions, in order to get overall credit for the assignments/programming projects. All homework must be turned in on Blackboard and must be completely legible. Any portion which is not clearly and easily legible will receive a 0. All programming projects must be submitted using the tool provided by Blackboard. I will not accept programming projects through e mail or by hard copy. Also, all programming projects must compile or they will receive a 10% AT MOST.

Late Policy

All assignments should be turned in on their due date. Programs turned in late will be graded on the following basis:

- **10 point penalty** if turned in within 24 hours late
- **20 point penalty** if turned in within 48 hours late
- **No points awarded** if more than 48 hours late

Make up exams will not be given except by my prior consent. You must notify me within 24 hours after missing the exam so that I may determine the appropriateness of allowing a make up exam. Examples of acceptable excuses would be the death of an immediate family member, or an illness requiring physician's attention. You must take all exams in order to pass the course; missing any one exam will result in an 'F' as your course grade.

Expectations

I am committed to quality teaching and to providing you a meaningful experience in this course but learning is your responsibility so please do your part in order to receive the maximum benefit from the course.

For this class, **I expect you to**:

- **Have your electronic devices (cell phones, notebooks, music players, etc.) OFF at all times (tests, and lectures).**
- Attend each class, arrive on time and remain in the classroom throughout the entire class meeting. If you have a legitimate and important reason for needing to leave early, please let me know before class starts.
- Complete all assignments and submit them on time (this is very important for you!).
- Interact respectfully with me, the course assistants, and your other classmates.
- Participate in class discussions and activities.

- **Remain on task and focused during class (i.e., no doing homework, engaging in side conversations, web-surfing, reading e-mail, Facebooking, chatting, IMing, etc. during class).**
- Access your Blackboard account frequently to get information on course policies, assignments, tests, grades, etc. **All information posted on it will be assumed to be known by the student 24 hours later.**
- Come speak to me IN PERSON and IMMEDIATELY at the **first** sign that you are having trouble with the class or if you miss assignments so I can try to help you.

Tentative Schedule

The following is a general outline for the course and may be revised as the semester progresses. In this, ST is Stallings book, and IR is Irvines book.

Monday	Wednesday
Aug 27th	29th
Sep 3rd	5th
10th	12th
17th	19th
24th	26th
Oct 1st	3rd
8th	10th
15th	17th
22nd	24th Assembly Language Fundamentals *IR: 3*
29th Data transfer; Arithmetic; Addressing *IR: 4*	31st Data transfer; Arithmetic; Addressing *IR: 4*
Nov 5th Procedures and Parameter Passing *IR: 5*	7th Procedures and Parameter Passing *IR: 5*

Monday	Wednesday
12th Logic and Decision Instructions *IR: 6*	14th Logic and Decision Instructions *IR: 6*
19th Review	21st Exam 2
26th Integer Arithmetic *IR: 7*	28th Advanced Procedures *IR: 8*
Dec 3rd Final Exam	5th
10th	12th

Important Dates

- August 27 - First day of classes
- August 30 - Last day to add a course or register for spring 2018
- September 3 - Labor Day - No classes
- November 14 - Last day to drop a course; will count toward the 6-drop rule
- November 22 - 24 - Thanksgiving Holiday - No classes
- December 6 - Study Day - No class
- December 7 - 13 - Final Exams
- December 14 - 15 - Commencement Ceremonies

Learning outcomes

At the end of this course, the student should be able to

1. Describe the progression of computer architecture from vacuum tubes to VLSI.
2. Demonstrate an understanding of the basic building blocks and their role in the historical development of computer architecture.
3. Design a simple circuit using the fundamental building blocks.
4. Explain how interrupts are used to implement I/O control and data transfers.
5. Identify various types of buses in a computer system.
6. Explain the reasons for using different formats to represent numerical data.
7. Explain how negative integers are stored in sign magnitude and twos complement representation.

8. Convert numerical data from one format to another.
9. Discuss how fixed length number representations affect accuracy and precision.
10. Describe the internal representation of nonnumeric data.
11. Describe the internal representation of characters, strings, records, and arrays.
12. Explain the organization of the classical von Neumann machine and its major functional units.
13. Explain how an instruction is executed in a classical von Neumann machine.
14. Write assembly language programs that use basic computation and simple I/o, standard conditional structures, basic iterative structures, and the definition of functions.
15. Demonstrate how fundamental high level programming constructs are implemented at the machine language level.
16. Explain how subroutine calls are handled at the assembly level.
17. Explain the basic concepts of interrupts and I/O operations.
18. Choose appropriate conditional and iteration constructs for a given programming task.
19. Describe the mechanics of parameter passing.

ABET Student Learning Outcomes

1. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
2. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
3. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
4. An ability to use current techniques, skills, and tools necessary for computing practice.

Students with Disabilities

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services. **Brownsville Campus:** Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

Mandatory Course Evaluation Period

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available:

- Fall 2018 Module 1: October 4 - 10
- Fall 2018 Module 2: November 29 - Decemeber 5
- Fall 2018 (full semester): November 15 - December 5

Attendance

Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

Scholastic Integrity

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

Sexual Harassment, Discrimination, and Violence

In accordance with UT System regulations, your instructor is a "Responsible Employee" for reporting purposes under Title IX regulations and so must report any instance, occurring during a student's time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct and discrimination.

Course Drops

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the "3-peat rule" and the "6-drop" rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.