

CSCI 112 INTRODUCTION TO COMPUTER SYSTEMS

Spring 2015

COURSE SYLLABUS

Course Description (from catalog)

Computer arithmetic. Von Neumann architecture. Instruction sets, data types, formats, addressing. Register and ALU organization. Memory hierarchy. I/O. Bus organization. Study of one or more assembly languages. Basics of implementation of higher-level languages.

Prerequisite: CSCI 41 (Introduction to Data Structures),
CSCI 60 (Foundations of Computer Science)

Units: 4

Lectures: T, Th 11:00 am – 12:15 pm, AgM 102

Lab sessions: F 10:00 am – 11:50 am, McF 201
1:00 pm – 2:50pm, McF 201

Instructor: Jin H. Park, Ph.D.

Office: Science II (C) #277

Office hours: M 3:00 – 4:00 pm

T, Th 1:00 – 3:00 pm

or by appointment

Phone: 559-278-4307

E-mail: jpark@csufresno.edu

Text book:

- Richard C. Detmer, *Introduction to 80x86 Assembly Language and Computer Architecture*, 3rd Edition, Jones and Bartlett Publishers, 2015 (ISBN 978-0-7637-7223-9)

Reference book (students do not have to purchase):

- Bryant and O'Hallaron, *Computer Systems: A Programmer's Perspective*, 2nd Edition (or later version) Pearson Prentice Hall, 2011 (ISBN: 978-1-284-03612-1)

Course Goals and Expected Learning Outcomes:

This course provides computer science undergraduate students essential knowledge in computer system/organization and assembly language programming. Students will gain register-level understanding of computer systems and the ability of writing assembly language programs.

At the completion of this course students will be able to:

- 1) demonstrate an understanding of number systems and computer arithmetic;
- 2) demonstrate an understanding of system-level organization/operations in a computer system;
- 3) demonstrate an understanding of register-level operations in a computer system;
- 4) write assembly language programs for a target architecture (Intel processor);
- 5) build a simulator for a major computer system component in an assembly language.

Assignments:

There will be several problem solving homework assignments and frequent programming assignments in 80x86 Assembly language. All work must be done individually. Violating this will result in an assignment grade of zero and possible academic dishonesty penalties. Problem solving assignments are due at the beginning of the class, and no late assignments are acceptable. Programming assignments are due as directed by the instructor, and there will be 20% off per day on late submissions. Programs should be readable with good documentation.

Evaluation and Grading Policy:

Midterm 1	25%, Feb. 24 (T)
Midterm 2	25%, April 09 (Th)
Final exam	30%, May 12 (T), 11:00 am – 1:00 pm
Assignments	20%

Note: no make-up exams, except emergency cases verified with official documents.

Participation:

Attending classes/labs is very important. It is not guaranteed that a student can succeed in this course without attending classes regularly.

University Policies:**Students with Disabilities**

Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the Henry Madden Library, Room 1202 (278-2811).

Honor Code

“Members of the CSU Fresno academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities.” You should:

- a) understand or seek clarification about expectations for academic integrity in this course (including no cheating, plagiarism and inappropriate collaboration)
- b) neither give nor receive unauthorized aid on examinations or other course work that is used by the instructor as the basis of grading.
- c) take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

Instructors may require students to sign a statement at the end of all exams and assignments that “I have done my own work and have neither given nor received unauthorized assistance on this work.” If you are going to use this statement, include it here.

Cheating and Plagiarism

"Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the Class Schedule (Legal Notices on Cheating and Plagiarism) or the University Catalog (Policies and Regulations).

Computers

"At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own computer or have other personal access to a workstation (including a modem and a printer) with all the recommended software. The minimum and recommended standards for the workstations and software, which may vary by academic major, are updated periodically and are available from [Information Technology Services](http://www.csufresno.edu/ITS/) (<http://www.csufresno.edu/ITS/>) or the University Bookstore. In the curriculum and class

assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Disruptive Classroom Behavior

"The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained. ... Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop and understanding of the community in which they live . . . Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

Copyright Policy

Copyright laws and fair use policies protect the rights of those who have produced the material. The copy in this course has been provided for private study, scholarship, or research. Other uses may require permission from the copyright holder. The user of this work is responsible for adhering to copyright law of the U.S. (Title 17, U.S. Code). To help you familiarize yourself with copyright and fair use policies, the University encourages you to visit its [Copyright Web Page](http://csufresno.edu/library/information/copyright/) (<http://csufresno.edu/library/information/copyright/>).

Technology Innovations for Learning & Teaching (TILT) course web sites contain material protected by copyrights held by the instructor, other individuals or institutions. Such material is used for educational purposes in accord with copyright law and/or with permission given by the owners of the original material. You may download one copy of the materials on any single computer for non-commercial, personal, or educational purposes only, provided that you (1) do not modify it, (2) use it only for the duration of this course, and (3) include both this notice and any copyright notice originally included with the material.

Beyond this use, no material from the course web site may be copied, reproduced, re-published, uploaded, posted, transmitted, or distributed in any way without the permission of the original copyright holder. The instructor assumes no responsibility for individuals who improperly use copyrighted material placed on the web site.

Tentative course schedule (subject to change with prior notice)

Class	Date	Topic	Reading
week1	1/15	Introduction, Computer systems/operations	reference materials
week2	1/20, 1/22	Data representation, Number systems, Integer arithmetic	Ch.1
week3	1/27, 1/29	Computer system components – CPU, memory, I/O	Ch.2
week4	2/3, 2/5	Elements of assembly language – statements, operands	Ch.3.1-3.4
week5	2/10, 2/12	Elements of assembly language – debugger, I/O	Ch.3.5-3.8
week6	2/17, 2/19	Basic Instructions – data copy, integer add/sub	Ch.4.1-4.2
week7	2/24, 2/26	Basic instructions – multiplication/division; <i>Exam1</i>	Ch.4.3-4.5
week8	3/3 3/5	Control instructions – jump, branch	Ch.5.1-5.2
week9	3/10, 3/12	Control instructions – loops and arrays	Ch.5.3-5.6
week10	3/17, 3/19	Stack, Procedures, Parameters	Ch.6.1-6.3
week11	3/24, 3/26	Procedures (advanced), Macros	Ch.6.4-6.6
week12	4/7, 4/9	Bit manipulation, Logical operations; <i>Exam2</i>	Ch.7
week13	4/14, 4/16	Computer systems – ALU, datapath, memory hierarchy	reference materials
week14	4/21, 4/23	String operations, numeric/ASCII string conversion	Ch.8
week14	4/28, 4/30	Floating point operations, Linking	Ch.9.1-9.6, ref. book
week16	5/5	Review	