Synopsis:

This course introduces computer science undergraduates to programming at the machine language level, as a means of exploring key concepts of microcomputer architecture, system software and peripheral hardware.

The course focuses primarily on assembly language for Intel Pentium processors running the Linux operating system and will employ the GNU assembler and program development tools.

Students are presumed to have prior experience doing computer programming in at least one high-level language (such as C/C++/java), and to be familiar with basic operating system commands (e.g., as covered in CS 110 and CS 112).

Class meetings will be held in the Michael D. Kudlick interactive computer classroom (Room 235, Harney Science Center) which affords convenient opportunities for combining formal instruction with "hands-on" programming exercises.

The course will consist of lectures, readings, discussions, demonstrations, consultations, independent design projects and scheduled exams, in addition to the in-class programming exercises and experiments.

Most commercial software projects consist of software modules written in at least two language – assembly and a higher-level language.

-- Michael Day, LAN Times, August 14, 1995

Drivers written in assembly language tend to be better optimized and use a smaller memory footprint when installed.

-- Liam Quinn and Richard Russell, FAST ETHERNET (Wiley, 1997), p. 179

[When] you're working in assembly language, you're as close to the machine as you can get. Assembly language hides nothing, and withholds no power.

-- Jeff Duntemann, ASSEMBLY LANGUAGE STEP-BY-STEP (Wiley, 2000), p. xxiii

Learning Outcomes:

- You will know the set of fundamental operations a computer can perform
- You will know how to build complex computations out of simple operations
- You will be able to "see through" code written in a high-level language
- You will gain the capability to fully utilize features in modern processors
- You will lay the conceptual ground for understanding later CS courses
- You will acquire a skill-set of practical value in professional practice

Instructor:

Dr. Allan B. Cruse, Professor of Computer Science and Mathematics
Harney Science Center - Room H-212   Telephone: (415) 422-6562
Office Hours: Mon-Wed 2:45-3:15pm, Tue-Thu 1:30-2:30pm
Email: cruse@usfca.edu   Website: http://cs.usfca.edu/~cruse/cs210

Textbooks (for collateral readings):

Robert G. Plantz, *Introduction to x86 Assembly Language using Linux,*
Sonoma State University (2006). [*prepublication manuscript*]

Kip R. Irvine, *Assembly Language for Intel-Based Computers (4th Ed),*
Prentice-Hall, Inc. (2003), ISBN 0-13-091013-9

Classroom Facilitiy:

Classes meet Tuesdays and Thursdays, 3:30-5:15pm, in the Michael D. Kudlick Interactive Computer Classroom (HRN-235). Students will need individual USF computer accounts set up for access during classes.

Exam Dates:

Midterm Exam I will be Wednesday, March 1.
Midterm Exam II will be Wednesday, April 5.
Final Exam will be Wednesday, May 17 (8:00am)

Grading scheme:

Class Participation	10%
Programming Projects	30%
Midterm Exams (2)	40%
Final Examination	20%

NOTE: Unprofessional conduct, such as an abuse of USF computer privileges (unauthorized access), or a violation of academic integrity (plagiarism or fraud), will result in the student receiving a failing grade.