

CS550W1
Computer Organization and Programming

Syllabus

Professor Stepleton

COURSE OVERVIEW.

A modern computer is a multi-layered, hierarchically organized system that includes both hardware and software. The purpose of the course is to introduce you to the various layers in an organized way, and to illustrate the various considerations that are involved in their both their internal design and their interaction with the overall system as a whole. In order to do this, we will be taking an approach that includes both broad concepts as well as many specific details and will be combining insights from both a theoretical and an engineering perspective, as appropriate.

Two texts are required for this course. The primary text is

Stallings, William. Computer Organization and Architecture, 6th edition; Prentice-Hall (2000). ISBN: 0-13-035119-9.

NOTE: The study guide is coordinated primarily with this text. In the study guides for the individual chapters the text is sometimes abbreviated as “COA6e.”

A supplemental text for this course, also required, is:

Abel, Peter. IBM PC Assembly Language and Programming, 5th edition, Prentice-Hall, 2001. Abbreviated: IPALP5e.

NOTE: The study guide also makes specific references to various topics covered in this text. In the study guides for the individual chapters the text is sometimes abbreviated as “IPALP5e.”

The course will primarily rely on Stallings to guide you through the major concepts and the study notes and assignments. In addition, supplementary material will be introduced from time to time from Abel, in order to provide the opportunity to study examples of executable assembly code that illustrate the various points under discussion.

NOTE: The study guides for the individual chapters of Stallings point out important concepts, clarify tricky or complicated matters in the text and show what should be emphasized and what may be glossed over or omitted as you study the various chapters. They are meant to be read with that volume in hand. They may be accessed through the “Course Content and Related Materials” entry on the Home Page.

In general, the best way to master the material in the course is by studying the chapters in Stallings, using the Web materials corresponding to the various chapters as a guide. There are also assignments to test and extend your knowledge of the material in each chapter. The assignments are due on Friday of the particular week. The assignments should be sent via email through the “Communications Tools” link on the course Home Page, preferably in the form of an MS-Word document as an attachment.

In addition to the weekly course work and home work assignments, there will be two quizzes, a term paper and a final exam. The objective of the quizzes will be to test your knowledge of the factual material that you have been studying. I plan to provide a review sheet to aid you in your preparation for the quizzes and aim for them to be simple and straight-forward, in an objective (true/false, multiple choice) format. The first quiz is scheduled for the 4th week of the course and the second quiz is scheduled for the 9th week of the course. These dates are tentative and may change, depending on the pacing of the class as it develops, but are meant to give you a rough idea of how the sequence and spacing will proceed.

The term paper (length: 10 type-written pages) will be due on the Monday of the last week of the course. I will be providing you with guidance and preparation about how to proceed towards writing the term paper as we get further into the course material. The main idea, however, will be for you to present an analytical treatment of a published research paper from an academic technical journal dealing with a research topic in computer architecture. The point of the paper will be for you to develop your analytical abilities by dealing with a single topic in a fair amount of detail. Most students find the experience a rewarding one, both for the in-depth knowledge that they gain, and from the sharpening of their research skills.

The final exam (length: indeterminate; as much but no more than you need) will be an open book final, based on guidelines that will be presented in advance. It will be due on the Friday of the last week of the course. The final exam format will be discussed and guidelines presented later in the course. Basically, it will give you the opportunity to synthesize what you have learned in the course in terms of the basic engineering principles we will point out from time to time and the ways in which they are applied to the design of a modern computer system.

NOTE: All of these testing components will make more sense to you as you begin to get more familiar with the course material and the way that the course is structured. For now, just note that the course is designed to help you develop THREE skills, as follows:

- a) Mastery of FACTUAL MATERIAL (through the quizzes),
- b) ability to ANALYZE (through the term paper), and
- c) ability to SYNTHESIZE (through the final exam).