



Electrical and Computer Engineering Department  
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**ENEE 350 Computer Organization, Fall 2015**

(Sections 201, 202, & 203; TuTh 2:00-3:15 p.m.; KEB1110)

**Course Objective:** To gain understanding of structure and organization of digital computers, including registers, memory, control, I/O, data and instruction formats, addressing modes, assembly language programming, elements of system software, subroutines and their linkages.

**Text:** Andrew S. Tanenbaum, *Structured Computer Organization, 5th Ed.*, Prentice Hall, 2006, ISBN 0-13-148521-0. (used, for lower cost)

**Alternate Text:** A. S. Tanenbaum, *Structured Computer Organization, 6th Ed.*, Prentice Hall, 2014, ISBN 0-13-291652-5. (if 5th ed. not available; e-book or rental o.k. too)

**Requirement:** An account on the Univ. of Maryland Glue computers with X-Windows terminal access.

|                 |  |       |
|-----------------|--|-------|
| <b>Grading:</b> | Exam I (about Class 13, Tues., Oct. 13)  | 27.5% |
|                 | Exam II (about Class 25, Tues., Nov. 24)   | 27.5% |
|                 | Final Exam (firm date: Thurs., Dec. 17, 10:30a.m. – 12:30p.m.)                             | 35%   |
|                 | Homework, unannounced quizzes, & instructor’s subjective impression of class participation | 10%   |

*Exams are closed book, closed notes, & no electronic devices, such as calculators, PDAs, etc. Homework will be collected & marked. There will be a few short assembly language programs as part of the homework. These programming assignments must be completed according to specification and turned in working (even if late); they comprise 40% of your homework grade. The late penalty for programming projects is 10% per day. No other late homework will be accepted.* Letter grades are based on semester average.

- If your final exam score is higher than your lowest score on Exam I or Exam II, then the final exam score will replace that lowest score in computation of your semester average.
- **No midterm makeup exams will be given for any reason**, except for hospitalization, incarceration, or serious documented illness beyond your control. If you must miss an exam, you must first get permission from Prof. Silio before the exam, or obtain a written excuse from the ECE Dept. Director of Undergraduate Studies based on written medical or circumstantial documentation, and the final exam score will count for that portion of the grade. This will count as your one replacement. An unexcused absence counts as a zero in your average.

**Approximate Schedule:** (Subject to amendments by instructor)

| <u>Starting about</u> | <u>Material</u>  |
|-----------------------|--|
| Class 1:              | Chapter 1. Introduction, and Appendix A Review of number systems conversions and complement arithmetic.                          |
| Class 3:              | Chapter 1. Introduction, history (memorize Fig. 1-2)   |
| Class 5:              | Chapter 2. Computer systems organization; and Chapt. 5 Secs. 5.4 – 5.6.  |
| Class 6:              | Chapter 3 (Sections 3.3 to end). Memory, CPU, chips, buses, interfacing.   |
| Class 7:              | Chapter 4. The microprogramming level.<br>(Secs. 4.1-4.3 & Mic-1/Mac-1, Microarchitecture Notes)                                 |
| Class 11:             | Chapter 5. The conventional machine level (& addressing modes).  |
| Class 14:             | Chapter 7. The assembly language level. (& examples from Silio notes)  |
| Class 19:             | Appendix B. and Silio notes: Floating-point data representations.  |
| Class 22:             | Chapter 6. The operating system machine level; pipelining, cache, branch prediction (Secs. 4.4–4.6) & virtual memory (Sec. 6.1). |

**Office Hours:** (for now at least) **Tues. & Thurs.: 9:30 – 10:30a.m. & 12:30–1:30p.m.**  
 in room number: **AVW-1411 Other times by appointment.**

- If you have problems with my office hours and need to see me you can make an appointment. My phone number is 301-405-3668, and my home number is 301-937-7418 in case you need to reach me there.
- If you have a **documented disability** and wish to discuss academic accommodations with me, please contact me as soon as possible and **not later than Tuesday, September 15**.
- If **any exam** (especially the final exam) is scheduled on a **religious holiday** that you are compelled to observe, and you must make arrangements to take the exam on a different date, please see me about making these arrangements **not later than Tues., Sep. 15**; else, **you will be required to complete the final exam as scheduled by the University**.
- **Emergency Protocols:** For university closures consult [www.umd.edu](http://www.umd.edu) in which case there will be no lecture. However, consult the course website listed below and continue doing readings and homework assignments posted in the Homework subdirectory. Midterm exams scheduled during closures will be postponed to the next available class as announced by instructor, who will communicate using UMEG's coursemail to your university registered email account. It is expected that university administrators will communicate to the instructor and to the students a new date, time, and place for a final exam scheduled during a university closure as final exams are required in undergraduate courses.
- **Attendance:** Students are responsible for all announcements and course material covered in lecture unless otherwise announced by the instructor in lecture.

### Homework and Grading Policies

- There will be approximately 11 homework/programming assignments during the semester. Homework is due at the **beginning** of class on the date indicated. **No late homework will be accepted for any reason.** The only exception is for programming assignments, as noted previously.
- Do homework on 8.5 × 11 inch paper with problems in the order of assignment. **Label the first page in the upper right hand corner with your full name, course number (ENEE350), recitation (i.e., discussion) section number, recitation instructor's name, and homework assignment number.** Staple the pages in the upper lefthand corner, and do not fold them.
- If you dispute your grade on any homework or exam, you have one week from the date the paper was returned to request a change in grade. After this time, no change in grade will be considered. All requests for a change in grade must be submitted in writing. to Prof. Silio through your recitation section instructor, who will first examine your request and make a recommendation. A request for change in grade must be labeled in the same manner as a homework assignment.
- It is important that you do the homework and especially both the microprogramming and assembly language programming assignments. While it is perfectly reasonable to discuss your approach to solving the problems with a friend, the final writeup of the solution should be your own work and not a copy of your friend's solution. If you have collaborated with classmates in accomplishing a programming assignment, you must list their names on the work you turn in. However, the exams are designed to determine if you really did the work yourself.
- Because it is not possible in finite time for the grader to mark all assigned problems in detail in assigning a homework score, solutions will be made available for each homework assignment and you should go over them in detail yourself to correct any errors you may have made that were not caught in the marking process. You might want to retain duplicate copies of your homework solutions to study for exams.

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- It is your responsibility to pick up handouts, solutions, and homework assignments when they are passed out in class. Professor Silio will not retain copies after the class in which the handout is passed out. If you must miss class, make arrangements with a reliable classmate to pick up a copy of the handout material for you; or make arrangements with other classmates to photocopy theirs.
- A **course web site** will be maintained (URL: [http://www.ece.umd.edu/class\\_enee350\\_under\\_Fall\\_2015](http://www.ece.umd.edu/class_enee350_under_Fall_2015); AFS directory: [/afs/glue.umd.edu/department/enee/public\\_html/class/enee350.F2015](http://afs/glue.umd.edu/department/enee/public_html/class/enee350.F2015)) which contains information, notes, software documentation, homeworks, and handouts. If you miss class, you may be able to find the missed handout (except for solutions) here in pdf format.

### Recitations

- During recitations your TA will go over solutions to selected homework problems. In addition, recitations provide you with an opportunity to ask clarifying questions regarding material or concepts presented in lecture.
- The style of the recitations will be interactive, so your participation is both encouraged and important.

### Note

- The University policy on the number of final exams a student must take on one day is no more than three. Students are strongly encouraged to check the final exam schedule before registering for courses to avoid having four or more finals on the same day.

### Reminder about Academic Integrity

- Academic dishonesty will not be tolerated. The University Code of Academic Integrity, which can be found at <http://www.inform.umd.edu/CampusInfo/Departments/JPO/> prohibits students from committing the following acts of academic dishonesty: cheating, fabrication, facilitating academic dishonesty, and plagiarism. Academic dishonesty in this class includes outright copying on homework; however, discussing homework problems and exchanging tips is permissible and also encouraged. Instances of academic dishonesty will be referred to the Office of Judicial Programs. Final examinations are not returned and therefore any that exist outside of the instructor's possession constitute unauthorized study materials. Use of unauthorized study materials is an academically dishonest act.

### Recommended Study Habits

- Read the specified sections of the book before class.
- Attend lecture, take notes, and annotate the relevant handout.
- After lecture study the reading assignment and corresponding handouts.
- Attend your recitation/discussion section and actively participate.
- Start on the homework and programming problems early and take advantage of office hours.
- Study homework problem solutions when handed out and do your own assembly language programming. This is a learn-by-doing course.
- Regularly devote **13 hours per week** to reading, homework, programming, exam prep, lectures and recitation.
- Do not fall behind!

### Copyright Notice:

- Class lectures, exams, and other materials are copyrighted and may not be reproduced for anything other than personal use without written permission of Professor Silio.