# Computer Organization and Assembly Language

## Fall  1998
## CS  33003

## Instructor

Dr. Robert A. Walker                                    MSB 351, 672-4004 ext. 351
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## Teaching Assistant

None

## Course Prerequisites

The *1998-1989 Undergraduate Catalog* lists the prerequisite for this course as *CS 23021 Intermediate Programming*.  An equivalent course taken elsewhere is also acceptable.

## Course Overview

The goal of this course is to provide an introduction to the internal operation of modern computer systems.  In particular, the course will cover low-level hardware details (combinational and sequential circuits), data representation (number systems, character encoding, and integer and floating point representation), basic computer system organization (CPU, I/O, memory, and disk), several instruction set architectures and assembly languages (emphasizing RISC architectures), and the internal operation of the CPU.  At the end of the course, if time permits, we may briefly preview parallel systems, operating systems, etc.

This course is listed in the 1998-1989 Undergraduate Catalog as a prerequisite for CS 43201 *Operating Systems*, CS 43111 *Structure of Compilers*, and 45101 *Computer Organization and Architecture*.

## Textbook

The required textbook for this course is:

 • *Computer Systems:  Architecture, Organization, and Programming*, Maccabe, Irwin, 1993.

Other reasonable textbooks that you might want to refer to, if you have access to them, are:

 • *Computer System Architecture*, Mano, 3rd edition, Prentice Hall, 1993.

 • *Computer Organization and Design:  The Hardware / Software Interface*, Patterson and Hennessy, Morgan Kaufmann, 1994.

## Class Web Page

The web page for this class is **http://www.mcs.kent.edu/~walker/classes/coal.f98**.  The web page will contain link to the following course materials.

 • Current class syllabus and schedule

 • Lecture notes (in PostScript and Adobe PDF format), including homework assignments

 • Homework and exam solutions

Other information may be included as well.  You might want to check the web page on a regular basis, in particular when a homework assignment is outstanding.

## Lectures

Students are expected to attend each lecture.  I will not take roll, and I understand that it may occasionally be necessary to miss a class, but in general I expect you to attend each lecture.

At each class, I will hand out one sheet of paper containing reduced copies of *at most eight* of my slides for that lecture.  If you would like to have reduced copies of *all* of my slides for that lecture, the full version of the lecture notes will be on the class web page before the lecture, and you can print them out.  Note that you are not required to either look at or print out these notes; they are provided solely for your convenience should you want them.  However, you should **_not_** consider skimming these notes to be an adequate substitute for attending the lecture, as they will contain only the text of my slides, not the comments that I will make in class.

My lecture notes will be drawn from a variety of sources.  The required text (Maccabe) will serve as a primary reference, although some material may be drawn from other books on computer organization, logic design, etc.

## Homework Assignments

There will be approximately seven homework assignments during the semester.  Most of the homework assignments will be pencil-and-paper based, although at least one will probably involve writing assembly language code.  Tentative due dates are shown on the Class Schedule, attached at the end of this syllabus.

### Late  Policies

In general, you will have adequate time to complete each homework assignment.  Most assignments will be given out in pieces after the corresponding lecture material has been presented, so you should be able to work on each assignment over a period of two weeks.  Waiting until the weekend before the due date to start the homework assignment may not be a good idea.

For homework assignments, **_n o_** late homeworks will be accepted, unless you make *prior* arrangements with me, or have a *documented* illness (in which case I expect you to contact me as soon as possible).

## Exams

There will be four exams (held during class) and a final exam (held during finals week).  The tentative dates for the exams are shown on the Class Schedule, attached at the end of this syllabus.  All exams are closed book and closed notes, and must be individual work.  It is expected that you take each exam at the scheduled time, unless you make *prior* arrangements with me, or have a *documented* illness (in which case I expect you to contact me as soon as possible).

## Academic Integrity

Student-teacher relationships are built on trust.  Students must trust that teachers have made appropriate decisions about the structure and content of the courses they teach, and teachers must trust that the assignments which students turn in are their own.  Acts which violate this trust undermine the educational process.  In this course, the penalty for **_any_** act of academic dishonesty is a final course grade of F.

### Cooperation  on  Homework  Assignments

Although each exam must be your own work, for homework assignments I strongly believe that discussion with your peers is an excellent way to learn.  If you don't understand something, discussing it with someone who does can be far more productive than beating your head against the wall.

Having advocated discussion, then, I must be about clear what is allowed, and what is not.  In general, students are allowed to cooperate as follows:  you are allowed to discuss with other students *the assignment*, and *general methods for solving the assignment*.  However, you are **_not  allowed_** t o work with someone else to actually *solve* the assignment, or to *write code* (even pseudocode) for a

program, and you are certainly ***not   allowed*** to *copy* anyone else's solution; doing any of these things will be considered cheating, and will be grounds for failing the course.

Note that there is a fine line between discussion and cheating.  If you are unsure what is allowed and what isn't, feel free to discuss the distinction with me, but if something feels uncomfortable, it's probably not allowed.

Finally, you should be careful not to give others access to your solution.  This means that if you type up your solution on a computer, you shouldn't keep your solution in a publicly-accessible directory, you shouldn't leave your terminal unattended, and you shouldn't forget to pick up your printouts.

## Grades

Your final course grade will be broken down as follows:

- Homeworks (approximately 7)          15%
- Exams (4)                            60%
- Final exam                           25%

The final course grade will be determined with A = 90–100, B = 80–99.99, etc.  There will be no curve at the end of the course, although individual exams, homeworks, etc. may occasionally (although rarely) be curved.  Thus you should always be able to determine how well you are doing in the course.