

CS380—Theory of Computation
Syllabus
Spring '15
Jim Rogers
x1671
jrogers@cs.earlham.edu
www.cs.earlham.edu/~jrogers/classes/CS380

Contact: Scheduled office hours : TBA

Also other times by appointment.

You can always get my current schedule via the link in the class homepage or at <http://cs.earlham.edu/~jrogers/classes/schedule.html>.

I strongly encourage you to send questions/requests for clarifications to me via e-mail. Unless you specifically request otherwise (or it seems inappropriate) I will strip identifying information off and send my response to the class list. Since most of your fellow students will have the same questions, you will be doing all of us a favor by making the effort to submit them—very much appreciated.

Text:

- Michael Sipser. *Introduction to the Theory of Computation*, Cengage Learning, 2013.
- Handouts.

We will be working initially from handouts and then will move to the Sipser text interleaved with additional handouts.

Structure: The handouts are not worksheets, they are a supplementary text. (In prior years I have worked from the handouts exclusively.) These include a number of embedded exercises which you will work through in class (and often as homework) in groups. There will also be exercises from Sipser some of which you will work on together, some independently.

Each handout will be distributed at the end of class. You are to read it and think about the exercises, but not actually work them out, before the following class. The

bulk of the next couple of classes will be reserved for you to work the exercises, working in groups which I will assign. We will come together frequently during the class to answer questions as they arise and discuss solutions to the exercises.

You will not necessarily have sufficient time to complete the exercises in class, in which case you will need to complete them as homework. It is important that you meet with the rest of your group and work together to complete them. The completed exercises will be due on the due date, at the beginning of class. That day will be spent answering any remaining questions you have about the material, going over additional material and introducing the topics of the next handout.

While the exercises are intended to be done collectively, each of you must turn in their own copy of the answers. These will not be graded closely. You will get full credit for each problem you have made a reasonable attempt to answer. Together, your grades on the exercises will account for 20% of your grade.

About one week after the assignment is due there will be a 15-30 minute quiz based on the material covered in the handout and the exercises. The quizzes *must be done individually*¹, so it is essential that you make sure that you actually understand the answers to the exercises well enough to be able to do them on your own. There should be sufficient time between the day on which the exercises are due and the day of the quiz for you to meet with me to go over any parts which are still giving you trouble. Together, your grades on the quizzes will count for 35% of your grade.

This structure can be very effective at bringing this material across, but it depends on all of us being conscious of how well each group is working. To that end, each of the exercise sets will be accompanied with a cover sheet that will include a log of the work you do. Each of you should keep an independent record in the log, for each session in which you work on the exercises, how long you spent (elapsed time), which exercises you worked on and who you worked with. The coversheet is an integral part of the exercise set. Your solutions will not be accepted without it.

While you will occasionally be asked to sketch algorithms in your favorite programming language, there will be no programming *per se* in this course. The course is about computability in *any* programming language, so we will not be interested in the details of any particular programming language.

There will two mid-terms and an end-term, probably take-home. The end-term

¹I intend to enforce this fully; so don't put yourself and me in the uncomfortable position of having to deal with a possible academic integrity infraction

will be scheduled during one of the last two weeks of class (which to be determined) so it isn't an official final, but will be comprehensive. The reason for moving it earlier is so that I can grade it and get it back to you *before* the end of the semester. This is to give you an opportunity to reflect on how the semester went for you. The final requirement of the class is that you write a short self-evaluation of your semester in this class—which will be due during finals week. Each of you will meet with me briefly during that week discuss these and my own evaluation of your semester. (Note well, these evaluations are of *your* performance in the class. They have nothing to do with your evaluations of the class and my teaching of it, which I will not see until after grades are turned in.) The self-evaluation is not optional, it is worth 5% of the grade. You will receive all 5% simply by taking it seriously.

It is essential that you complete the assigned work on time. It is possible to fail to pass this class and the easiest way of doing so is to fail to complete the assigned work.

Grading:

Exercise Sets	20%
Quizzes	35%
Mid-terms	10% each
End-term	20%
Self-evaluation	5%

The mid-terms are not optional. The final period is 10:30AM, 6/May.

Electronic Devices

I ask you to not use electronic devices in class, other than those specifically required by the Academic Enrichment Center. You *may* be permitted to use your laptop/netbook in class to take notes (generally, a very bad idea) or consult on-line editions of the text. *But*, if you choose to do this, you will need to convince me that you are paying attention. The way to do this is to always be the first person to answer a question. I reserve the right to ban use of electronic devices in this way on a per student basis.

All other electronic devices should be shut-up and stowed during class. None of the rest of us should either see or hear them.

Academic Honesty, College Policy:

“The College trusts students who enroll at Earlham to be honest seekers of truth and knowledge. This trust is extended to all students by other students and by teachers, and is manifested in a variety of

forms. . . . Students must be mindful that, although Earlham encourages cooperative and collaborative, rather than competitive, modes of learning, one's work must still be one's own, unless explicitly assigned to a group. Giving or receiving aid inappropriately on assignments and tests, or plagiarizing by using another person's words or ideas without credit, constitutes a serious breach of our trust in one another and in the integrity of the search for truth."

Learning to think for yourself, assess information judiciously, and speak and write effectively in your own voice is at the heart of a liberal arts education and global citizenship. Treasure and cultivate these skills. Papers and other work, including digital creations, downloaded or copied from other sources, or in which words or ideas belonging to others have been deliberately misrepresented as your own, will receive an automatic F, as they thwart your learning process and damage the integrity of knowledge-discovery. If you have questions about how to find, integrate, and properly cite sources, never hesitate to ask for help.

An excellent place to find help in knowing when and how to cite others' work appropriately can be found on the Libraries page: http://library.earlham.edu/friendly.php?s=academic_integrity. The site also includes Earlham's full statement on academic integrity and procedures for addressing academic violations of the Student Code of Conduct.

Academic Integrity, My Commentary

Except when explicitly structured as a group project all of the assignments are to be done individually. While you are welcome to discuss the problems with each other and are encouraged to be available to help each other with the material, the solutions you submit must be your own work. So, break your discussions off before you get into the details—help each other with the concepts, not the specifics.

Similarly, your solutions must not be based on solutions to similar problems you may find elsewhere. While you are welcome, even encouraged, to consult other texts or students who have taken the class in the past, if you should find a problem similar to one you have been assigned you should not consult its solution. The problem sets are assigned as exercises for you to do. They are not research problems for which you should be looking for the answers in reference material.

I take academic honesty seriously—truth is the foundation of our community ethic. While I understand that recognizing the line between serving your fellow students as a resource and helping them inappropriately is not always easy to discern,

you must keep these two separate. If you have any doubt at all, please discuss it with me either in person or by e-mail. (Questions of this sort will be kept confidential.) If any doubt remains, err on the side of being less helpful than you might.

Disabilities:

Students with a documented disability (e.g., physical, learning, psychiatric, visual, hearing, etc.) who need to arrange reasonable classroom accommodations must request accommodation memos from the Academic Enrichment Center and contact their instructors each semester. For greater success, students are strongly encouraged to visit the Academic Enrichment Center within the first two weeks of each semester to begin the process.

It is important to follow this procedure.