Meeting Information

College Hall 351
Tuesday/Thursday 4:30 – 5:45 p.m.
Final exam: Saturday, Dec. 16, 1:15–3:15 p.m. Course web page: http://www.blackboard.duq.edu

Instructor

Dr. Jeffrey Jackson
Office: 441 College Hall
Office Hours: Monday/Wednesday 2:00—3:00, Tuesday/Thursday 3:00—4:30, or drop-in/appointment
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Textbook


Objectives

Why do we call your major “computer science” rather than, say, “computer programming” or “software engineering”? One of the key reasons is that there actually is some science underlying our field. For example, computation is carried out by physical devices, which immediately raises scientific questions, such as: what physical laws govern computation, and what predictions can we make about computability given models of the laws of computation?

The objective of this course is to introduce you to some of the science of computer science. We will learn about various models of computation that have been proposed and try to understand these models, particularly their limitations. As time allows, we’ll also touch on a relatively new model of computing, quantum computation, and consider how it relates to more traditional models.

Some of our specific objectives will be:

- Review and enhance necessary discrete mathematical knowledge.
• Understand the formal notion of a language and some of the properties and operations of languages in general.

• Know what a regular language is and how it is related to Finite Automata.

• Know what a context-free language is and how it is related to Pushdown Automata.

• Know what recursive and recursively enumerable languages are and how they are related to Turing Machines.

• Become familiar with the notion of decidability and some of the fundamental decidability results.

• Become familiar with the notions of space and time complexity and some of the basic results and open problems in computational complexity.

• Develop some ability to prove theorems within the various formal models of computation discussed in this course.

**Undergraduate Grading**

Grading will be based on:

• Homework assignments 20%

• Semester exams (4) 15% each

• Final exam 20%

We will have frequent homework assignments of varying degrees of difficulty. Most homework problems will come from the textbook. I attempt to cover all the material necessary to solve the homework problems in class, but you may need to read the textbook (or other sources) in order to solve some problems, and in general I highly recommend reading the textbook material associated with the lectures. Homeworks will normally be due Tuesdays unless I say otherwise in class. There is a slight possibility we may have a small computer-based assignment or two during the course; if so, they will be included in the homework assignment portion of the final grade. But for the most part, homework will be of the pencil-and-paper variety.

Exams will be in class and closed book, and they will consist of simple factual/definitional questions along with problems generally similar to those assigned for homework. I do not intentionally ask questions on exams over material that was not covered in lectures or homework assignments. The final exam will be comprehensive and similar to the other exams, but will tend to expect a less detailed recall of the material than the semester exams (except for the material covered between the last semester exam and the final).

This material is very different than most of your CS courses because it tends, like much of science, to use a lot of mathematical concepts. I encourage you to work together with other
students on the homework problems, particularly if you’re having trouble understanding the material. This is a great way to learn this type of material. However, I still expect that anything you turn in to me reflects your understanding of the material. So, for example, it’s OK to work out the basic ideas together with one or more other students, but what each of you writes down to turn in to me should be your own working out of the details. It’s especially annoying to me to grade the same small mistakes in two different papers. You should avoid annoying me ;-) Also, see the honor policy below.

While I will not formally take attendance or include it in grading, I expect regular attendance at lectures. I do not anticipate requiring any presentations in this class. I will at time encourage classroom participation by calling on you for an answer, but your level of participation is not directly included in your grade.

**Late Work Policy:** Because I plan to discuss homework the day it is due, and because I want to keep everyone up to date as much as possible, late work (without a good excuse) will receive no credit. However, I will probably drop at least one low homework grade before computing the final homework average.

The final grade will be assigned as follows:

- 100--93 = A
- 92--90 = A-
- 89--87 = B+
- 86--83 = B
- 82--80 = B-
- 79--77 = C+
- 76--70 = C
- 69--60 = D
- below 60 = F

I attempt to write exams that I believe you can do reasonably well on if you work hard. I also may adjust my grading on a homework or exam if some of the material seems to be more difficult than I expected. So when the end of the semester comes, I do not deviate much if at all from the above numbers in determining your final grade. That is, you should not expect a final curve to help you out if your grades are low all semester. Also notice that I do give minuses as well as pluses. So if an A- would distress you, plan to get a 93 or better.

**Graduate Grading**

The basic grading framework outlined above will hold for graduate students. However, each homework assignment will typically include some graduate-only questions that will more deeply and/or broadly probe the graduate student’s understanding of the material.

**Honor Policy**

All exam work that you turn in, whether in-class or take-home, must be your own, although of course any clarification of questions that you receive from me is acceptable. Cheating on an exam will result in course failure. Similarly, any homework you turn in should represent your understanding of the material, not be a copy of someone else’s work. If any part of your
homework is copied, I may give a 0 (which will not be dropped) to the entire assignment. Two or more copying incidents may result in course failure.

Schedule

We are scheduled to have 28 class meetings plus the final exam. The tentative schedule is (number of meetings in parentheses):

- Background Mathematics and Introduction to Languages (6, exam Thursday, Sept 14)
- Regular Languages and Finite Automata (6, exam Thursday, Oct 5)
- Context-free Languages and Pushdown Automata (6, exam Thursday, Oct 26)
- Turing Machines (5, exam Tuesday, Nov 14)
- Introduction to Computational Complexity (5)

Notes

Students with documented disabilities are entitled to reasonable accommodations if needed. If you need accommodations, please contact the Office of Freshman Development and Special Student Services in 309 Duquesne Union (412-396-6657) as soon as possible. Accommodations will not be granted retrospectively.

The information in this syllabus is subject to change at the instructor’s discretion.