Mathematical Foundations of Computer Science

Instructor: Robert Ravenscroft
rar@cs.uri.edu

Course Description. Combinatorial techniques used in non-numerical computation and analysis of algorithms. Logic, proofs, enumeration, recurrence relations, graphs and networks, finite automata. Complexity analysis of several representative problems and algorithms for their solution. (4 credits)

Course Objectives. Study the basic foundations of discrete mathematics/combinatorics. Learn the mathematics used in formal aspects of computer science such as algorithm analysis and data structures, programming language semantics, databases, and theory of computation. Develop an ability to think creatively and critically about computer and mathematical problem solving.

Office hours: 1:00–1:30 Tuesday
1:00–1:30 Thursday
by appointment
Other times to be determined.
Office hours are in Tyler 256 (Dr. Lamagna’s Office).

Expectations. CSC 340 is an upper level Computer Science course. You should not be approaching this course as just a student out to earn a grade, but as a Computer Science Professional out to do a good job! You will find the demands of this course different from lower level CS courses. The text and other resources are written for professionals. That means they provide new material that you will likely have to read more than once to understand. Remember, at this level of CS, if a text is easy to understand on a first reading, then it is not teaching you anything new!

At this step of your academic career, you are expected to have the ability to design, write, and debug a program involving a few hundred lines of code using the skills and techniques developed in earlier CS courses. In other words, it is not enough to know the commands needed to program. You need to be a problem solver and be able to use those commands to solve commonly occurring problems, and to do so without detailed algorithmic specifications. While this course does not involve coding, there are similar expectations for your mastery of the course material. It is not enough to just learn the material presented. To be successful, you need to be a problem solver and be able to use the tools and techniques from this course to solve problems beyond those presented in the course.

Communication is an essential part of being a computer scientist. You often have to explain your work to others or discuss with others their work. It is expected that you will be an active participant in the class by asking questions, posing solutions, or discussing problems under consideration.
Intellectual curiosity is also an important attribute of a successful computer scientist. It is expected that if you encounter something you do not know, you will not ignore it. Rather, you should seek out the solution on your own initiative, or ask the question in class or at office hours. Once in the real world, you are expected to be a problem solver. If you encounter a problem that you do not know how to solve, you go out and find the solution. You do not ignore the problem and turn in an incomplete project.

**Grading:**

- 25% Homework
- 35% Exams and quizzes
- 40% Final Exam

The instructor may raise or lower a student’s grade one notch (e.g., B- vs. C+) based on non-quantifiable factors such as class attendance, class participation, and student effort.

**Exams and Quizzes.** Two exams will be given during the semester. Dates will be announced in advance. For studying purposes, the first will occur around the end of topic 2 in the syllabus and the second around the end of topic 4 in the syllabus.

If the instructor feels it is necessary, there may be an occasional short quiz. Quizzes will be announced in advance.

**Final Exam.** The final exam will be given at the regularly scheduled exam time on Tuesday, May 17 at 8:00am.

**Missed Exams.** Make-up exams will be given only in extreme cases and will require a note from the Student’s Dean.

**Incompletes.** The instructor is not a regular member of the department. Incompletes can only be given in cases of real emergency and will require approval of the department chair.

**Attendance.** Attendance is expected at all classes. Attendance may be taken. Too many missed classes can lower your grade one notch.
**Collaboration.** You are expected to be aware of and observe the University regulations on academic honesty. Unless otherwise instructed, you are to do your own work on all assignments. *Instances of academic dishonesty will result in no grade on the assignment or exam and will be reported to the Dean’s Office.*

Use of personal communication devices during exams and quizzes is regarded as cheating and will be treated as such.

---

**Personal Communication Devices**

Should your cell phone, pager, or other personal communication device interrupt the class, you and your device are to leave the class. You will be welcomed back at the next class meeting.

Should your device interrupt a quiz or exam, you must turn in your quiz/exam before you leave. A **make up will not be given**.

Should you be expecting a message regarding a personal or family emergency and you cannot turn off the ringer or beeper, let the instructor know about your situation before class. Sit near the door and quickly and quietly go into the hall when your call comes in.