<center>

$CS : 4340 : 0001$ (22**C** $: 131 : 001$) **Limits of Computation**
Fall 2015

</center>

Class Schedule

12:30–1:45 pm Tuesday and Thursday at 221 MacLean Hall (MLH).

Instructor

Kasturi Varadarajan: 101D MacLean Hall, 335-0732, kasturi-varadarajan@uiowa.edu
Office hours: 3:00–4:30 Monday, 3:30–5:00 Thursday. To meet me at other times, you can
set up an appointment.

Teaching Assistant

Watch the course page for information on your TA.

Course Web Page

`www.cs.uiowa.edu/∼kvaradar/fall2015/limits.html`. This is also accessible from the
ICON page for this course.

Departmental Information

Department of Computer Science, 14 Maclean Hall. The office of the DEO, Prof. Alberto
Segre, is located here.

Content

This course addresses questions such as

- Are there computational problems for which there are no algorithms? What are
  some examples? How do we go about showing that a particular problem admits no
  algorithms?

- What happens when we restrict resources such as time or space? How can we prove
  that with more time, we will be able to solve problems that we couldn't otherwise.

- What happens to these questions when randomized algorithms are allowed?

- Precisely how do we define the classes P, NP, and co-NP?

- How can the NP-Completeness of SAT (the first NP-complete problem) actually be
  demonstrated? In the algorithms course, we only hint at this.

- What about space complexity and other models of computation?

<center>1</center>

To answer these and other questions, we'll learn about simple models of computations such as Turing machines and circuits. Our text is *Computational Complexity*, by Arora and Barak.

Prerequisites

Undergraduate Algorithms (At the UI this is CS:3330 (22C:031)).

Grading

The grading will be based on 5 to 6 homeworks (40 percent of the grade), a midterm (25 percent), and a final (35 percent).

The policy on late homeworks is that you have a quota of three days for the entire semester that you may use for late submissions. So for example, there will be no penalty if you submit the third homework a day late, the fifth two days late, and the rest of the homeworks on time. Once you use up your quota of three days, any homework submitted late will not be accepted and you will get 0 points for that homework.

When you submit a homework X days late, your quota gets decreased by X irrevocably. You can only be late by an integer number of days, obtained by rounding up – if you submit 10 hours after the deadline, for example, your quota is depleted by one day.

Exam Dates

I will announce the date of the midterm shortly – watch the course homepage. The final will be during finals week, as scheduled by the office of the registrar. I will announce the date once we are informed about it.

Collaboration

No collaboration is allowed on the exams. For homework problems, collaboration is allowed, assuming each of you has first spent some time (about 30 minutes) working on the problem yourself. However, no written transcript (electronic or otherwise) of the collaborative discussion should be taken from the discussion by any participant. Furthermore, discussing ideas is okay but viewing solutions of others is not. It will be assumed that each of you is capable of orally explaining the solution that you turn in, so do not turn in something you don't understand. Students are responsible for understanding this policy; if you have questions, ask for clarification.

Course Accounts

You will be assigned an account on the computer science department machines shortly, if you do not already have one. In addition, you will need your HawkId and password to access information about this course on ICON and to submit the programming assignments.

Administrative Home

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at `http://clas.uiowa.edu/students/handbook`.

Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences.

Accomodations for Disabilities

A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See `www.uiowa.edu/~sds/` for more information.

Academic Honesty

All CLAS students have, in essence, agreed to the College's Code of Academic Honesty: "I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled (see CLAS Academic Policies Handbook).

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident. (See CLAS Academic Policies Handbook).

Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Department of Public Safety website.