CSC363 - Computational Complexity and Computability
Summer 2007

Instructor: Matei David, email: `matei@cs.toronto.edu`, office: SF4302-F, phone: 416-946-3924

Lectures: Tuesdays, 6-8pm, in GB 119

Tutorials: Tuesdays, 8-9pm, in GB 119

Office Hours: Thursdays, 5-6pm in SF 4302-F, or by appointment.

Website: `http://www.cs.toronto.edu/∼matei/363s07/`. Refer to this site periodically.

Textbook: M. Sipser. *Introduction to the Theory of Computation.* Thomson Course Technology, 2005. This is the main book I will be following. We will be interested in chapters 3, 4, 5, 7 and 8.

Reference Books: M. Garey and D. Johnson. *Computers and Intractability: A Guide to the Theory of NP-Completeness.* (1979) This book is an excellent reference, and contains a large compendium of NP-complete problems in the back.

Cormen, Leiserson, Rivest and Stein. *Introduction to algorithms (second edition).* McGraw-Hill, 2001. This book is mainly concerned with algorithms, and some other courses may be based on it. For our purposes, chapters 34 and 35 are relevant.

Course Contents:
Computability Theory (6 weeks): Turning machines, Church's thesis, decidability and semi-decidability, diagonal arguments, the Halting Problem and other undecidable problems, reductions.
Computational Complexity (7 weeks): The classes P and NP, polynomial time reducibility, NP-completeness, Cook-Levin theorem, various NP-complete problems, space-bounded computation.

Marking Scheme:
4 assignments worth 10% each, due on June 5th, June 19th, July 17th and August 7th.
1 midterm exam worth 15%, June 26th.
Final exam worth 45%. To pass the course, you must achieve a grade of at least 40% on the final exam.
An extra 6% can be achieved through quizzes, see below.

Quizzes: In addition to assignments, midterm and the final, which already sum up to 100%, there will be several quizzes given during tutorials. They will be 10 minutes long and cover material presented on that day or on the previous week. I expect to have 5-6 such quizzes. They will be marked quite harshly with no part marks as the assignments or the tests. I will take the 3 best quizzes from each student, weight them with 2% each, and add a maximum of 6% to the final grade.

20% Rule: For the midterm exam and the final exam, you will receive 20% of the marks on each question where you answer "I don't know" and nothing else. This does not apply to homework assignments or quizzes.

Lateness Policy: Assignments are due at 6pm *sharp* on Tuesdays, in the CSC 363 drop box in BA 2220. I will pick them up minutes before lecture and I won't have time wait for late assignments. I will not accept assignments during lecture or during tutorials. I will allow each student 3 grace days, to be used as you see fit. These days end at 6pm. So, following a Tuesday due date, I will collect whatever is left in the dropbox at 6pm on Wednesday, Thursday and Friday. These will be marked as having used 1, 2 and 3 grace days, respectively. If you have no grace days left and your assignment is late, it will not count. For any kind of special arrangements, contact the instructor *before* the assignment is due.

Plagiarism and other Offences:
Assignments are to be done individually. *The work you submit must be your own.*
`http://www.cs.toronto.edu/∼fpitt/documents/plagiarism.html`
`http://www.cs.toronto.edu/∼clarke/acoffences/`