Overview of CPSC 421/501 (Introduction to Theory of Computing)

Instructor: Prof. Joel Friedman   Class: MWF 8:00–8:50
ICICS/CS X561   Dempster 301
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`http://www.math.ubc.ca/~jf/courses/CS421` is the location of the most up-to-date versions of all handouts for this course, including this document, homework and solutions, sample exams and solutions, etc.

Overview: This course will cover introductory computer science theory, using the text *Introduction to the Theory of Computation* by Michael Sipser, 3rd Edition; additional handouts may be given. Formally, the prerequisites are CPSC 221 or both of CPSC 216 and CPSC 220; CPSC 320 is not a prerequisite but is recommended; however, this course develops almost all concepts from scratch, so students outside computer science with enough exposure to math may also be able to take the class (see me). The rough schedule is below:

1. **Main Points:** See the handout "Computability and Self-Referencing in CPSC 421," roughly 2–3 weeks.
2. **Turing Machines and Computability:** Chapters 3–5, roughly 2–3 weeks.
3. **Complexity Theory and NP-Completeness:** Chapter 7, maybe 8,9. roughly 2–4 weeks.

   Midterm: Friday, October 17, covering material up to October 3.

4. **Regular Languages:** Chapter 1, roughly 1–2 weeks.
5. **Context Free Languages:** Chapter 2, roughly 1–2 weeks.
   Essay: CPSC 501 students will have an essay due on Friday, November 28.

   Classes End: Friday, November 28.

Homework: Homework will be assigned either by week or by topic. Homework solutions are generally posted when the homework is returned, although the class may vote to have solutions posted earlier, especially as exams draw near.

   Late homework will be graded only if resources permit, without penalizing those who hand homework in on time; specifically:

0. the grader is hired for a fixed number of hours per week;
1. the grader will first grade all homework handed in on time;
2. if the grader has time left over that week, the grader may grade a small amount of late homework (handed in before the solutions were posted) from the previous week.

   In practice, if one or two people hand in late homework, there is a good chance it will be graded, but if too many people hand in late homework, it will not be graded. In particular, late homework is always in danger of not being graded.

Midterm and Final: Both exams will consist of some calculations and some more conceptual questions.

   I will give only one midterm and only one final during the semester; there are no "make-ups" or alternates. Please make sure you do not make travel plans, work plans, etc. without regard for the midterm and final dates; also, do not make such plans assuming that the preliminary exam schedule will not change. A missed midterm normally results in a grade of 0; if documentation is provided for a legitimate excuse (e.g., medical emergency), the midterm grade will be the final exam grade (after any scaling).

Course Grade: For CPSC 421 students, your grade for the course will be

$$(.55)f + (.35)\max(f, m) + (.10)\max(f, m, h),$$

where f, m, h are, respectively, your final exam grade, your midterm grade, and your homework grade. For CPSC 501 students your course grade will be 80% of the CPSC 421 grade plus 20% of the essay grade. The homework grade computation will drop your lowest two homework scores.