INTRODUCTION TO COMPUTABILITY

MATH 29 — SPRING 2013

Mathematical reasoning may be regarded rather schematically as the exercise of a combination of two facilities, which we may call intuition and ingenuity. (Alan Turing, 1939)

Classes	Instructor
Where: 007 Kemeny	**François G. Dorais**
When: Schedule 2	
Mon. 1:45 pm – 2:50 pm	**Office Hours:** 317 Kemeny
Wed. 1:45 pm – 2:50 pm	Mon. 3:00 pm – 4:30 pm
Fri. 1:45 pm – 2:50 pm	Thu. 2:00 pm – 3:30 pm
X-hour: Thu. 1:00 pm – 1:50 pm	
(X-hour will rarely be used)	**Other times available by appointment**

Prerequisites There are no formal prerequisites for this course. Familiarity with sets, functions, relations and formal logic are a plus, but we will cover background material as needed. As long as you're willing to learn to work abstractly and to read and write proofs, you are sufficiently prepared!

Textbook Rebecca Weber, *Computability Theory*, Student Mathematical Library 62, American Mathematical Society, Providence, RI, 2012. (ISBN: 0-8218-7392-X)

Quizzes There will be two short in-class quizzes, each worth 20% of your final course grade. Topics covered on each quiz will be announced a week in advance.

Homework There will be weekly homework assignments which will together account for 40% of your final course grade. Each problem will be evaluated using the following scale:

4: You have clearly solved the problem, perhaps with some minor errors or small logical gaps.

3: You have clearly made significant progress toward solving the problem, but there were some errors or logical gaps.

2: You have clearly made progress toward solving the problem, but you made a crucial error or you missed some essential steps or ideas.

1: You have clearly made a reasonable attempt to solve the problem, unfortunately with little or no success.

0: You made no visible attempt at solving the problem.

A star may be added to any grade except 0, to indicate exceptional quality of exposition. For example, a grade 4* indicates a complete solution with no errors, logical gaps, and impeccable style. Similarly, a grade of 2* can be awarded for a reasonable but flawed solution, where the error is meticulously explained. A star is worth an extra point.

Homework will always be due on Monday. Late homework will not be accepted in the absence of divine intervention or matters of similar weight. Unexcused, late, or missing papers count zero.

Projects   Your final course evaluation will be a term paper, worth 20% of your overall course grade. You may choose any relevant topic for your paper; some topic ideas can be found on the course webpage. Your term papers will be evaluated in three stages:

- *Paper outline*. You will first submit a topic together with an itemized list of main ideas to be presented in the final product. The ideas should be sufficiently detailed that it is clear exactly what you intend to write.

- *Draft paper*. You will then submit a first draft with all the main development for comments. It may be unpolished and have a few small gaps but it should be nearly complete.

- *Final paper*. You will finally submit a polished and complete paper to be evaluated. The expected length is around 8 pages, though the topic usually dictates the length. Shorter papers are acceptable if the ideas are fully developed and any longer paper would be too fluffy. Longer papers are acceptable if there are no redundancies or unnecessary fluff.

The outline and draft stages will be evaluated together to form half of your project grade. This is so that you can choose to put more effort on one or the other. On the one hand, if your outline is extremely detailed then your draft will mostly consist in putting the parts together in a coherent whole and your outline will be given more weight than your draft. On the other hand, if your outline is just a list of ideas then you will need to develop these ideas in your draft and your outline will be given less weight than your draft. The other half of your project grade will be the evaluation of your final product.

Honor   The honor principle is interpreted as follows in this course. Ask your instructor if you are uncertain how the honor principle applies to a particular situation.

The quizzes are individual examinations: no collaboration, no notes and no outside help.

Collaboration on homework is encouraged. You may also consult any resource you deem useful, including your instructor. However, you must properly cite any outside sources and acknowledge collaborators. what you submit should be your own work, written by yourself and in your own words. Copying or looking at another solution in order to write your own is considered a breach of the honor code.

The projects are individual but you are expected to use outside sources and guidance from your instructor. You must properly cite all of your sources. The writing must be your own. Try to find different ways to present proofs and explanations from those in your source, use your words as much as possible and cite your source at each point where it is used.

Disabilities   Students with disabilities of any kind are invited to discuss appropriate accommodations with the instructor as early as possible. All such conversations will be confidential, except that the Student Accessibility Services may be consulted to find appropriate accommodations.