

# Course Information Sheet: CSC304F – Fall 2016

## Instructor

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## Course Web Page and Discussion Board

Please see the course web page which provides some more details about the course; the web page will be updated frequently:

<http://www.cs.toronto.edu/~bor/304f16/>

Please consult the web page frequently for materials and important announcements. Lecture slides and assignments will be posted (sometime after the lecture) on the web page. However, as the course progresses, the posted lecture slides may become more “sketchy” and the posted slides are *not* a substitute for class attendance and participation. The course discussion board will also be used for announcements and discussion of various topics. It is also the preferred forum for asking questions about class material (or other topics) that are likely to be of general interest to the class. It can be found at:

[piazza.com/utoronto.ca/fall2016/csc304](http://piazza.com/utoronto.ca/fall2016/csc304)

## Topics

CSC304 is a new course that introduces computer science students and students in related disciplines to the well established field of game theory, mechanism design and social choice as it is now being impacted by computational and informational concerns as well as new applications such as online auctions. Some specific topics that will be part of the course include the following: concepts in game theory (e.g. games in standard form and games in extensive form, zero-sum games, congestion games, Nash equilibria, dominant strategies, games of complete information and Bayesian games of incomplete information), mechanism design (truthfulness, auctions, matching markets, revenue and social welfare, optimization vs approximate “simple” mechanisms), and social choice (e.g. voting rules, stable marriage).

## Textbook

While there is no one textbook, I will often follow a new (not yet published) textbook for CSC304 *Game Theory, Alive* by Anna Karlin and Yuval Peres. That text can be accessed online from Anna Karlin's web site <http://homes.cs.washington.edu/~karlin/>.

This will be one of the main sources for the course. We will also be using the text *Algorithmic Game Theory* edited by Noam Nisan, Tom Roughgarden, Eva Tardos and Vijay Vazirani published by Cambridge University Press. A non-printable version can be found online. A standard undergraduate text is "Introduction to Game Theory" by Martin Osborne who is a faculty member in the University of Toronto Department of Economics. Some topics are also covered in the textbook *Networks, Crowds and Markets* by David Easley and Jon Kleinberg. For an online version of that book, see:

<http://www.cs.cornell.edu/home/kleinber/networks-book/>. There are also a number of courses with excellent lecture notes or slides or videos. In particular, I suggest Tim Roughgarden's lectures, which are available in pdf and as well in videos, and also Kate Larson's Waterloo slides. But note that there are many other excellent courses that can be found online.

## Prerequisites

The only stated prerequisite is a probability course. The 3rd year algorithms course CSC373 might well have been listed as a corequisite. Some familiarity with linear algebra, graph theory and calculus is also helpful. We will try to make the course as self contained as possible.

**Important Notice:** Prerequisites and co-requisites are *not* checked at time of enrollment. However, they are checked later and if you do not have the required prerequisites/co-requisites or have not obtained an official waiver, then you will not be allowed to take the course. If you are unsure of your status (e.g. coming from another faculty, campus or university), please consult with the DCS Undergraduate Office.

## Course Evaluation

Course evaluation will be based on three assignments (15% each), one mid-term test (15%), and one final examination (40%)

**Assignments** The assignments will not involve programming, but some may involve the use of installed software to work with or visualize specific phenomena in action. There will definitely be some questions that require a proof. The following are tentative due dates for the assignments. Note that since this is the first time we are offering this course, we may need to extend assignment due dates (say by up to a week) to better reflect the material presented. But we will try to stay to the proposed schedule.

- Assignment 1: due October 7, 2016
- Assignment 2: due October 28, 2016
- Assignment 3: due November 25, 2016

Assignments will be due by the beginning of class on the specified date. We are planning on using online submission of assignments. Details will follow. **Late assignments will not be accepted.** We will make accomodation for excused absenses (e.g. illness, an organized University acitivity) with the proper documentation.

**Midterm** There will be one 50 minute midterm test tentatively scheduled for Friday, November 4. Midterm dates will be confirmed at least three weeks in advance.

**Final Exam** There will also be a final examination at the end of the course to be scheduled by the registrar.

### Other Policies

- I strongly disapprove of students scheduling courses that have conflicts with regard to when CSC304 lectures and tutorials are held. (Note that there will be some lectures on Fridays as well as the midterm. There may be possiblyome tutorials on a Monday or Wednesday, but usually tutorials will be on Fridays.) Since the Faculty does not prevent scheduling conflicts from occuring, I will only say that I will make no accomodation for any missed classes, assignments or tests due to such conflicts.
- I will make a reasonable accomodation for missed work due to excused and document reasons such as illness.
- Pleasse make yourself aware of the University regulations concerning plagiarism. I have a pragmatic suggestion as to how to avoid any potential issues. Namely, I am not against collaboration where students work together to better understand the material. But when it comes to writing up an assignment do not use any notes taken from the collaboration and wait at least an hour before writing down anything learned during the collaboration. If you take any material from say a text or online source you must cite that source. In general, it is better to spend time thinking about solving an assignment question than spending hours searching for a solution.
- In all my assignments, tests and exams, I use the 20% rule. You will receive 20% on any question or subquestion for which you write "I do not know how to answer this question". You will receive 10% if you leave a

question blank without that statement. If you write something which does not make any sense you will not receive any credit. But you should try to solve any question where you believe you have a reasonable approach.

- Regarding policy: If you feel that any question was not properly graded, you must submit to the instructor (within one week of the work being returned) a written explanation of why the question was not properly graded. For simple clerical errors (e.g. incorrect calculation of the grade), the instructor can usually correct that immediately.
- We plan to use an online submission system for assignments. If you are submitting a hand written assignment, be sure that your handwriting can be easily read and then scan the assignment to create a pdf file. ( Details to be provided.)