Welcome to ECE-345! Algorithms today play an important role in our daily life. Computer engineering, biology, physics, economics, etc., they all need efficient algorithms and robust data structures.

Staff

Professor Andreas Veneris, SF-2001 (veneris@eecg.toronto.edu). Office hours: Tue 1-2pm (SF 2001), or by appointment.

Teaching Assistants: Head TAs for this course are John Adler (adler@eecg.toronto.edu) and Zissis Poulos (zpoulos@eecg.toronto.edu).

Lecture Schedule

LEC0101: Mon (12pm-1pm, LM159), Tue (12pm-1pm, NL6) and Thu (12pm-1pm, BA1160).
LEC0102: Mon (11am-12pm, LM162), Tue (11am-12pm, NL6) and Thu (10am-11am, BA1130).

Each student is registered in one of the four tutorial sections.

TUT0101 runs on Wed (12pm-2pm, BA1200).
TUT0102 runs on Fri (9pm-11pm, GB405).
TUT0103 runs on Tue (1pm-3pm, GB404).
TUT0104 runs on Wed (12pm-2pm, GB404).
TUT0105 runs on Wed (12pm-2pm, GB304).

In tutorials, we will answer questions about the lecture material, address homework material and solve sample pre-announced problems from the textbook.

Textbook and Class Contents

The required textbook for this course is T. Cormen, C. Leiserson, R. Rivest, C. Stein (CLRS), “Introduction to Algorithms,” McGraw Hill 2009 (3rd edition). CLRS is a well-written comprehensive textbook used by most major universities. No other text is required and no lecture notes will be distributed.
In this class we will cover the following material:

- Background: asymptotics, recurrences, combinatorics, randomization, graphs and trees (Chapters 1...5, Appendices A, B and C)
- Sorting: quicksort and analysis, heapsort and analysis, other sorting methods, lower bounds in sorting and selection in linear time (Chapters 6...9)
- Binary Search trees, Red-Back trees, Amortized Analysis, Splay trees, Hashing (Chapters 10...13, 17)
- Dynamic Programming and Greedy Algorithms (Chapters 15 and 16)
- Basic graph algorithms (breadth-first search, depth-first search) (Chapter 22)
- Minimum Spanning Trees and Single Source Shortest Paths (Chapters 23 and 24)
- Introduction to theory of computation and NP-Completeness (Chapter 34)
- Introduction to Machine Learning
- Introduction to Blockchain Technologies

Webpage and Bulletin Board

All official announcements will be posted on the course Portal. *It is your own responsibility to check it at regular intervals, i.e., once per day.* Questions on the material (i.e., lectures, exams, labs etc) will be welcomed on the board. **No solutions to problems should be posted by students on the board.** Only the instructor and TAs may post solutions. Please do not use the board for any posts other than those relating to the course.

On the Blackboard you will also be able to find the homeworks, sample problem solutions, previous exams and other useful resources.

Shortly after each lecture, the instructor will post the respective textbook sections for the material taught. This is a *reading assignment, i.e.,* the material you need to read before the next lecture.

Course Requirements and Grading Scheme

The final grade for this class has three components:

- **homeworks:** There will be five homeworks you will do in groups of 2-3 students. You can switch groups between homeworks but you will receive the group grade each time. More details about proper homework submission are on the WWW. Deadlines for homeworks are final! *Absolutely no late homework will be accepted.* Homeworks account for 25% of your grade.

- **midterm exam:** There will be one midterm of two hours and it is open CLRS book. The midterm accounts for 35% of the grade.
• **final exam**: Open CLRS book, two and half hours and 40% of the grade.

Exam dates and rooms will be announced at a later time. Exam material will be much simpler versions of the problems you will see in the homeworks. Exam type material will be practiced regularly at tutorials.

**Remarking:** You have exactly seven (7) working days to submit your work (homework or midterm) for remarking from the time we release it to you. Exact time when assignments are returned will be promptly announced in the WWW. *There are NO exceptions to this rule and no late homework will be remarked.* For remarking the midterm, you will need to clearly indicate on a separate piece of paper the reason you believe you were marked unfairly. *Staple* (do not glue, etc!) this paper to your work and submit it to the instructor or the head TA.

If there is a legitimate reason for a late assignment or exam absence (illness, etc.), discuss the matter with the instructor. Keep in mind that official documentation must always be provided (*i.e.*, doctor letter etc).

**Cheating Policy**

Cheating is against “fair–play” and will not be tolerated under any circumstances. While the pressures of many classes, homeworks, work and/or extracurricular activities can be great, this is never an excuse for copying solutions from others. **The University holds among its highest principles the notion of academic freedom and integrity. Cheaters will face the University’s disciplinary committee as well as receive a failing grade in this course.** If you think that there is an issue that influences your performance in the class then talk to the instructor.

**How to Get the Most out of this Course**

You are urged to read the text, as it is quite thorough, with many examples and with good motivating discussions and intuitions. The WWW is full of additional scientific and historical material. Do a lot of practice problems from the book. Read the bulletin board regularly and post questions! Attend lectures, tutorials and office hours. Keep up with the pace of the class.