EXPANDED COURSE DESCRIPTION
ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
Lassonde School of Engineering
Electrical Engineering Computer Science
LE / EECS 6111 3.0 SECTION M
ADVANCED ALGORITHM DESIGN AND ANALYSIS
FALL 2018 / WINTER 2019

Last Modified Date: 08/20/2018

COURSE CALENDAR DESCRIPTION

This is an advanced theoretical computer science course directed at non-theory students with the standard undergraduate background. The goal is to survey the key theory topics that every computer science graduate student should know. In about two weeks for each selected topic, we will gain insights into the basics and study one or two example in depth. These might include: a deepening of student's knowledge of key algorithmic techniques, randomized algorithms, NP-completeness, approximation algorithms, linear programming, distributed systems, computability, concurrency theory, cryptography, structural complexity, data structures, and quantum algorithms. Students will be expected to give a presentation on some topic new to them and solve some difficult problems in homework assignments. Prerequisites: LE/EECS 3101 3.00 and any fourth-year theory course.

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INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
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<tbody>
<tr>
<td>Edmonds, Jeffrey A</td>
<td>Sec. M / LECT / W</td>
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ADDITIONAL INFORMATION

TOPICS INCLUDE
- Quantifiers
- Loop Invariants
- Recursion
- Network Flow
- Linear Programming
- Randomized Algorithms
- Entropy
- Greedy Algorithms
- Algebra
- FFT
- Common Knowledge
- Dynamic Programming
- Approximation Algorithms
- NP-completeness
• Computability

TEXTS:
• Cormen, Leiserson, Rivest, and Stein “Introduction to Algorithms”, second edition
• Jeff Edmonds’ “How to Think about Algorithms”

GRADING:
• Assignments (30%)
• A test every 2 weeks (30%)
• Presentation (30%)
• Class Participation (10%)

ACADEMIC INTEGRITY LINKS
• Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
• Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS
• Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
• Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
• Academic Accommodation for Students with Disabilities - http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/
• Counselling and Disability Services - http://cds.info.yorku.ca/
• York University’s Policies on Sexual Violence - http://secretariat-policies.info.yorku.ca/policies/sexual-violence-policy-on/
• York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

LAND ACKNOWLEDGEMENT
• We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendat, and the Métis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peacefully share and care for the Great Lakes region.
• The Indigenous Framework for York University: A Guide to Action can be found here: http://indigenous.info.yorku.ca/
• Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements

Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.
Moodle @ York University