EXPANDED COURSE DESCRIPTION
ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
Lassonde School of Engineering
Electrical Engineering Computer Science
LE / EECS 2030 3.0 SECTION Z
ADVANCED OBJECT ORIENTED PROGRAMMING
FALL 2018 / WINTER 2019

Last Modified Date: 08/20/2018

COURSE CALENDAR DESCRIPTION

This course continues the separation of concern theme introduced in LE/EECS 1020 3.00 and LE/EECS1021 3.00. While 1020 and 1021 focuses on the client concern, this course focuses on the concern of the implementer. Hence, rather than using an API (Application Programming Interface) to build an application, the student is asked to implement a given API. Topics include implementing classes (non-utilities, delegation within the class definition, documentation and API generation, implementing contracts), aggregations (implementing aggregates versus compositions and implementing collections), inheritance hierarchies (attribute visibility, overriding methods, abstract classes versus interfaces, inner classes); applications of aggregation and inheritance in concurrent programming and event-driven programming; recursion; searching and sorting including quick and merge sorts); stacks and queues; linked lists; binary trees. Prerequisites: cumulative GPA of 4.50 or better over all major EECS courses (without second digit "5"); LE/EECS1021 3.00 or LE/EECS 1020 (prior to Fall 2015) 3.00 or LE/EECS1022 3.00 or LE/EECS 1720 3.00. Course credit exclusions: AP/ITEC 2620 3.00. Previously offered as: LE/EECS1030 3.00, LE/CSE 1030 3.00.

INSTRUCTOR(S)

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ADDITIONAL INFORMATION

TEXTBOOKS:
• Big Java Early Objects, C. Horstman, Wiley, 5th Edition (Optional)
• Java Concepts Early Objects, C. Horstman, Wiley, 2015 (Optional)

TOPICS COVERED:
- OO: classes, objects, methods, Javadoc, Exceptions, JUnit & Testing Strategies, equals, comparable, hash code
- DbC (precond., postcond., invariant)
- Utility Classes (e.g., Math, Arrays)
- Use of Generics and Interface
- Use of Collection:
  1. List: ArrayList, LinkedList
  2. Set: HashSet, LinkedHashSet
  3. Map: HashMap, SortedMap
- Big-O: Introduction, searching and sorting
- Aggregation and composition
- Inheritance
- Testing interface in Junit
- Recursion: Programming, Runtime and correctness

COURSE LEARNING GOALS/OBJECTIVES:
At the end of this course, students are expected to be able to:
1. Implement an Application Programming Interface (API).
2. Test the implementation.
3. Document the implementation.
4. Implement aggregations and compositions.
5. Implement inheritance.
6. Use recursion.
7. Implement linked lists.
8. Analyze the correctness and termination of recursive algorithms.
9. Analyze the running time of (recursive) algorithms.

GRADES:
The weight distribution of the course components is as follows:
15% - Lab Assignments
30% - Lab Tests
5% - Class participation
50% - Final Exam

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
- Counselling and Disability Services - http://cds.info.yorku.ca/
- 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 peaceably 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