

LE/EECS1021 Z,X - Object Oriented Programming from Sensors to Actuators (Winter 2020-2021)

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Syllabus and Mark Breakdown

View

Title

Object Oriented Programming from Sensors to Actuators

[Slide deck](#) from intro to the course.

Description

This course "introduces student to computational thinking - a process-based approach to problem solving. It uses a problem-based pedagogy to expose the underlying concepts and an experiential laboratory to implement them. The programming language is chosen so that it is widely used in a variety of applications, is object-oriented, and is of industrial strength (Java is an example of such a language). The problems are chosen in order to expose abstract programming concepts by immersing them in relevant and engaging applications. The experiential laboratory is based on sensors and actuators that connect to a computer. The problems are chosen with consultation with the various engineering disciplines in the Faculty with a view of exposing how computing is used in these disciplines. *Prerequisites: LE/EECS1011 3.00. Course credit exclusions: LE/EECS 1022 3.00. Previously offered as: LE/EECS1020 3.00, LE/CSE 1020 3.00.*

Synchronous vs. Asynchronous Class videos

All key video material will be posted on eClass for viewing asynchronously. These will mostly be [YouTube videos](#) routed to eClass with interactive H5P content overlaid. Students have the option of joining me and others during synchronous class time or office hours. For the most part, any one-on-one discussions will be

Classes

1. Section X: 11:30am - 12:20pm on Monday and Wednesday at 2:30pm - 3:20pm
2. Section Z: 10:30am - 11:20am on Monday and Wednesday at 10:30am - 11:20am.

These are optional synchronous sessions via **Zoom** (link: <https://yorku.zoom.us/j/93198828757?pwd=WnRvMIJYejZlZ2lwK1FsK0ZlSmV4QT09>). Class Zoom sessions will be recorded and posted.

Labs

Labs are held over Zoom sessions, synchronously. You are required to attend and to usually demonstrate a program or working piece of hardware. Teaching assistants will grade you based on your demonstrations during these labs. Short reports may also be required.

Lab session times are listed on the w2prod.sis.yorku.ca website. Zoom links will be announced.

You are required to have Arduino-compatible ([Grove Beginner Kit](#)) hardware in EECS 1021. This is the same hardware as was used in EECS 1011. You may reuse the hardware from EECS 1011 if it is in working condition. [Alternatives](#) can be obtained as per the advice here.

Regarding attendance I want to make sure that we also remain flexible and understanding about the situations that we find ourselves in during the pandemic, so I want all of you to know that you can miss up to two labs during the semester with no penalty to your grade. No doctor's note or official absence justification will be required. If you attend all of the labs, we'll remove the worst two grades.

Office hours



Office hours: Mondays 2-3 and Wednesdays 1:30-2:20. **Zoom** link: (<https://yorku.zoom.us/j/94452395292?pwd=ajVQdFpreERTVTdXYVdVaGpYV2hnZz09>).

Learning Outcomes

By the end of the semester, students are expected to be able to:

1. Demonstrate the ability to test and debug a given program and reason about its correctness. (GAI 2b)
2. Given a problem specification and a suitable API, build an application that meets the given requirement. (GAI 4b)
3. Use ready-made collections to solve problems involving aggregations of typed data. (GAI 5b)
4. Build an event-driven application that controls sensors and actuators in order to connect events to physical actions. (GAI 4b)
5. Program common applications from a variety of engineering disciplines using an object oriented language and solve them on the computer. (GAI 4c)

Email and Communication

Urgent matters should be brought up during synchronous office hours or class time. Email (eeecs1021.winter2021@gmail.com) will be responded to as time permits. If you have a concern about accommodations, errors in grading, a problem with assignment submission, an error in a VPL or H5P submission, etc. please document and email your concern to the gmail account. If I don't have time to deal with it during the semester I will examine it once the semester is done and prior to final grade submission.

Grading

As we did in EECS 1011 (Fall 2020), we are using "Proficiency Grading" ([link](#)) for EECS 1021. Basically, it means that if you complete all the work in the course you'll get a B+. No midterm, no final exam. To achieve an A or A+ you will need to perform additional work related to a *major* programming project. Details on this to be released later in the semester.

The B+ portion of the class is made up of four main components. Each is worth an equivalent portion of your B+:

1. Labs (lab reports, lab demonstrations, etc.): 20%
2. *Minor* Project: 20%
3. Class Readings and videos (tracked on eClass): 20%
4. Online interactive activities (Matlab Grader, non-video H5P, etc.): 20%

Effectively, each of these is worth 20% of your final grade. Each sub-component within the main components is weighted identically (signified by a grade of 1) unless it is stated otherwise.

Lab components: Each lab is worth an equal portion of the 20%, no matter what the breakdown of points or marks in a given lab. For instance, if there were five labs in a semester and Lab X's marking guide had 15 points in it and you received 7 points, it would be worth 1.87 out of 20 (i.e. $20/5 \cdot (7/15)$) associated with all the labs. (You can miss up to two labs with no penalty.)

Minor project: Any component of the minor project associated with a lab counts as a lab. Components completed during the semester outside of the labs and due to the final project report make up the 20% for the minor project.

Major project: The *optional fifth component* is worth 20% and completing it will put you in a position to achieve A or A+. The major projects will be graded relative to one another, based on the skill and originality demonstrated in the submission. Students submitting major projects will be expected to make themselves available for a video conference interview to describe and discuss their project.

Note that the submission of a major project is not a guarantee of an A or A+. For example, not completing the four main components of the course or submitting a trivial, relatively unskilled and/or unoriginal major project will be considered grounds for not assigning an A or A+.

A note about the Minor and Major Projects and Java vs. Arduino

It is expected that a significant amount of the algorithmic work in both your minor and major projects occur on your personal computer (Windows, Mac, Linux) using Java at runtime. Projects that rely in large part on runtime effort on the Arduino (Grove) platform instead will be graded as "marginally meeting expectations" or lower.

In other words, you are expected to take advantage of the Arduino platform and to use it to accomplish your tasks, but the objectives of the course rely mostly on your development of skillsets related to the Java exercises and platform.

[Note: This page is subject to change without notice within the first month of the course]

◀ Echo360 Lecture Capture Videos (hidden)

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Minor Project Overview (Jan 27 update) ▶

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