ECE241 Data Structures and Algorithms
Fall 2022
Syllabus

Instructor: Prof. Eric Polizzi, *Marcus 201C*
TAs: Zibin Chen, Braegan Spring

Day and Time: Lecture: M-W-F 1:25-2:15pm Morrill 2, Room 222
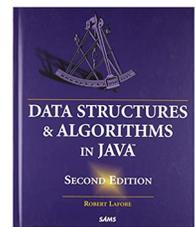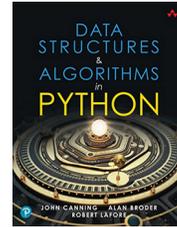   Discussions/Labs: Thursday 11:30-12:45; 1:00-2:15pm ELAB-306
Office hours: TBD

"Robert Lafore" Textbook (highly recommended but not required):

"Data Structures and Algorithms in Python"... not yet available (in press)
In the meantime, you can have a look at:
"Data Structures and Algorithms in Java" 2nd Edition

Outline of the Course

This course introduces basic data structures and their application using the Python programming language. We introduce a mathematical framework for evaluating the efficiency of algorithms, and develop implementations of basic data structures such as lists, stacks and queues. We study searching and sorting algorithms and introduce recursion as a strategy for improving the running time of these algorithms. This leads us to study more advanced data structures that are defined recursively, such as trees and heaps. We cover several advanced topics, such as hash tables and the storage and exploration of graphs.

Course Goals

At the end of this course, you should have learned:

- How think about data and operations on data

- How to design data structure for efficient use

- How to determine the efficiency of an algorithm

- Basic data structures and algorithms

- More complex programming techniques

Class Meetings

There are two types of class meetings held for this course:

  •Lectures will be held three times a week. The main goal of the lectures is to present and discuss the main content that is covered in this course.
  •Discussion/Lab sessions are held weekly. The goal of the discussion session is to reemphasize the topics covered in the lecture and illustrate the concepts using specific graded lab activities. Projects will also be presented and discussed.

  •All class materials will be posted on Moodle

These components of the course are designed to provide ample opportunity for you to clarify reading assignments, ask questions, and practice your skills. You are encouraged to seek any additional help you need during office hours.

Class Scheduling (Proposal)

	Mon	Tue	Wed	Thu	Fri
Sep			7	N/A	9
	12		14	15	16
	19		21	22	23
	26		28	29	30
Oct	3		5	6	7
			12	13	14
	17		19	20	21
	24		26*	27*	28
Nov	31		2	3	4
	7		9	10	
	14		16	17	18
	21	22			
	28		30	1	2
Dec	5		7	8	9*
	12				

Color	Meaning
Green	New project
Pink	Project due at 11:59pm
Blue	Lab Activities
Red	Mid-term
*	Review session for Mid-Term or Final

Grading

Your final grade will be derived from your performance in three areas:

- Projects. Those are large and **time consuming** coding assignments that require the development of solutions to practical problems.
- Lab Activities: Google Colab (python notebook) activities.
- Exams consist of on mid-term exam during the semester and one final exam. The exams are closed-book, closed-notes and evaluate how well you retained and understood the course content as well as how well you can apply the course concepts to new problems. For each exam, an in-class review session will be held to provide time for resolving issues regarding the content and procedure of the exam.

Midterm is held according to the schedule on the course website. The final exam is scheduled by the university.

The final grade will be norm-referenced (i.e., **graded "on a curve"**) with the following weights:

- Lab Activities: 15%
- Projects: 40%
- Exams: 45% with the following formula $(1/3)*\min(\text{midterm},\text{final})+(2/3)*\max(\text{midterm},\text{final})$

You are encouraged to track your scores on Moodle to ensure that you have received the appropriate credit for each of your assignments and exams. No "make-up" assignments will be given (with exception to the cases stated in the examination policy below).

Some Course Policies

Class start at 1:25pm. Late arrival is distracting and inconsiderate.

Exams will be based heavily on class notes, projects and discussions. Examinations assume familiarity with all lectures, projects and lab activities. You are expected to attend all classes and are responsible for knowing the material and assignments from every class.

Scheduling conflicts regarding exams should be reported to the instructor **immediately**. In case of a medical

emergency, make-up exams will be given only if you provide a valid written excuse (as defined in Undergraduate Rights and Responsibilities) and notify me prior to the missed exam. Other missed exams will be considered failures. If advanced notice is possible and not given, the instructor may refuse the request.

Assignments are due as posted on the course web page. **Late submissions will never be accepted**.

Due to the very large class size technical email should be sent to TAs, email-based requests for homework and project assignment will be limited to a maximum of three per assignment per student/team. If you need further help, we highly encourage you to make use of office hours. If you are having difficulties with any of the material (or basic background), come to office hours. Do so before you fall behind.

For Projects, consultation with fellow students is encouraged. However, **directly copying another student's or team's work defeats the purpose of the assignments and exams and is an honor code violation.** Violations will result in serious penalties including course failure and possible disciplinary action. If in doubt, please consult the instructor or the official UMass guidelines regarding academic honesty.

Missing lab activities
There will be **no make-up**. You are allowed to miss 1 lab assignment **with** or **without** excuses, you will get a 0 grade but the lowest grade will be dropped at the end of the semester. If you miss a second time, however, you can provide me with a valid excuse (doctor notes) for at least one of the times that you have missed. Also, if you miss a particular lab activity because of some good reasons, you are welcome to attend the other lab session (if space permitted).

Missing projects
Project extension beyond the deadline is not allowed (**no exception, no extension policy**). If you have a valid excuse (doctor notes), you need to upload it on Moodle before submission.
Warning: you have two weeks for completing your projects but you are supposed to get started right away. If you have a valid excuse such as you have been sick for one week (with doctor note), you are still expected to have worked one week (~50% of project completion) and your unfinished project must then be submitted on-time.