Syllabus
COMP 152
Data Structures and Algorithms

Spring 2026

1 Logistics

- **Where:**
  - Class: Center for Science and Business (CSB), Room 303
  - Lab: Center for Science and Business (CSB), Room 309
- **When:**
  - Class: MWF 9–9:50am
  - Lab: W 2–3:50pm
- **Instructor:** Logan Mayfield
  - *Office:* Center for Science and Business (CSB), Room 344
  - *Phone:* 309-457-2200
  - *Website:* `http://jlmayfield.github.io/`
  - *Email:* lmayfield *at* monmouthcollege *dot* edu
  - *Office Hours:* By appointment.
- **Website:** `http://jlmayfield.github.io/teaching/COMP152/`
- **Credits:** 1 course credit

Note: This Syllabus is subject to change based on specific class needs. Significant deviations from the syllabus will be discussed in class.

2 Description, Content, and Learning Goals

A continuation of COMP 151 that explores the essential data structures and algorithms of modern computing, including lists, stacks, queues, heaps, and trees. Students will design, analyze, and build Python programs that implement and utilize these data structures to solve computational problems, including a thorough survey of sorting and search algorithms. These theoretical constructs are complemented by exposure to good software development practices, including data abstraction via abstract data types and object-oriented software design. Strong emphasis is put on analyzing and evaluating how implementation choices made by the programmer impact overall program performance and maintainability.

2.1 Textbook

Bradley N. Miller and David L. Ranum. *Problem Solving with Algorithms and Data Structures using Python: Interactive Edition.* Franklin and Beadles. 2023. Runstone Academy.

2.2 Topics

- Review of Python fundamentals
- Experimental and Asymptotic Algorithm Analysis
- Arrays and Sequence Data Types
- Abstract Data Types
- Binary Search Trees and Tree Traversal Algorithms
- Sorting, Searching, and Selection Algorithms
- Object-Oriented Design Basics and Patterns
- Recursion
- Stacks, Queues, Deques, and Priority Queues
- Linked Data Structures
- Maps and Dictionaries (as time allows)
- Graph Algorithms (as time allows)

2.3 Programming Environment

Students should make every effort to setup a programming environment on their personal computer. If this is not possible or desirable, then a programming environment will be made available on campus computers.

- *Language:* Python - `https://www.python.org/downloads/`
- *Development Environment:* VS Code `https://code.visualstudio.com/`
- *Version Control and Assignment Management:* Git `https://git-scm.com/downloads` and Github Classroom `https://classroom.github.com/`

The language and version control system are non-negotiable. Everyone must use them. You are welcome to explore development environments besides VS Code, but you're likely going to be on your own if you run into installation and configuration problems.

3 Workload

Time spent on work for this course will likely vary by student and will, in general, vary week to week. On average, this course should require about 13 hours of work per week per student. The following table provides a rough estimate of the distribution of this time over different course components.

Assignment Type	Time/week
Class Time & Labs	5 hours/week
Self-Study & Reading	2-3 hours/week
Projects	3 hours/week
Homework Problems	1-2 hours/week
	11-13 hours/week

The course uses fairly standard types of assignments: labs, homework problems, exams, projects, etc. The number of such assignments you can expect to complete is given below along with individual assignment type descriptions.

Category	Number of Assignments
Projects	2–3
Exams	6–7
Labs	8–10
Homework	5–7
Portfolio Review & Self Evaluation Meetings	4–5

Labs

Labs are hands on, active learning periods. You'll dive into new ideas and new techniques through programming problems done with a partner and with the instructor there to help. Where other assignments are more about reinforcement and assessment of things previously learned, lab time is a time to dive into new things. *They goal of a lab is to explore, to play, to break things then fix them, to ask questions, and to otherwise uncover everything you can about a new corner of programming.*

Expect to do labs on a weekly basis. They will typically take not more than the two hour lab period and will never require that you work on them outside of that lab period. We'll typically go over lab problems in detail during the class period immediately following the lab.

Homework

Homework is practice. It's drills. It's activities designed largely to reinforce and strengthen your understanding of material learned through reading, through class time, and through lab. Homework lets you gut check what you think you know and how well you know it. They afford to you the time to do the work and then check that work using other references, including classmates. They are meant to be low stakes assignments. Just don't confuse low stakes with low importance. Practice, repetition, and reinforcement through homework is important for learning. It is what gets you ready for exams, projects, and programming outside of this class.

Homework assignments will typically involve completing problems in the online text as well as other problems related to the current material. The class will work-on and discuss problems of interest between the assignment and due date of the problem set. A review of homework problems will typically proceed exams.

Exams

Exams are meant to test your understanding of and ability to apply ideas covered previously in the course. They are a gut check the current state of your learning. They let you answer the question, "Do I know the material as well as I think I know the material?" Compared to homework, they are higher stakes assessments of your learning because you typically lack the safety net that is your notes, the text, and other references.

For the most part, exams will be done in class or in lab and will be announced ahead of time in order for you to prepare. Expect these exams to take all or most of a class period and involve multiple questions or a multi-part problem. On rare occasions we may have small pop-exams that are unannounced, involve one or two quick questions, and will only take up a small portion of the start of a class period.

Projects

You should look at the projects like game day or the big performance. They are, in large part, what we're preparing for with other smaller assignments. You should give them your best effort and a great deal of your time. You'll learn and grow the most as a programmer by really digging in and engaging in the projects and all of the challenges you'll face when working on them.

Projects are large scale programming assignments done over the course of two weeks. They will draw on everything you've done and learned in the class up to that point. They will also typically involve some new ideas that you must navigate and integrate into your work. Some lab and class time will be used to work on the projects, but you should plan for the bulk of your work on them to take place outside of class and lab.

Portfolio Review & Self-Evaluation

Self-reflection and self-evaluation is a critical component of learning and vital to a growth mindset. We will keep a portfolio of the work you do throughout the semester. Much of this will be done automatically by our assignment management and version control software. At regular intervals throughout the semester you will meet, one-on-one, with me to *present your portfolio*, review items from your portfolio that best gauge how well you're doing at meeting the course goals and expectations, and discuss how that success maps to a letter grade.

4 Ungrading & Final Grades

This class is largely ungraded. That means your assignments will not be graded for points and your final grade is not determined by a point-based, numerical grading system. You will get feedback on your work but you will see points on nothing. You don't earn points for doing work or getting something correct nor

do you lose points for getting something wrong. We're here to learn. Doing the work is how we do that and getting things wrong some or most of the time is part of learning.

4.1 Self-Evaluation & Final Course Grades

Throughout the semester you'll be asked to engage in regular self-evaluation. This process is described in detail in additional documentation. Part of the process includes you self-assigning a course grade based on your self-evaluation. Your self-evaluation and self-assigned grade are then discussed with me in a one-on-one meeting during which we'll agree upon your current grade. The key here is that *your self-evaluation and self-assigned grade begins the conversation, not my assigned points.*

Below are some general rules of thumb we'll try to stick to when talking about grades. They relate grades to course competency expectations and Monmouth College policy.

- **A** - Exceeding course expectations.
- **B** - Meeting and occasionally exceeding course expectations.
- **C** - Meeting course expectations. *This is the minimum grade required to continue on to COMP152. So, a C means you can be successful in a class that builds upon the things learned in this class.*
- **C-** - Mostly meeting course expectations. *This is the minium grade that counts towards a major.*
- **D** - Occasionally meeting course expectations, but mostly not. *Grades in the D range earn credit towards graduation but fall below GPA requirements.*
- **F** - Did not meet course expectations.

My hope is that the self-evaluation and self-directed grading process provides a lot of flexibility in terms of how you can achieve success in this course and meet your grade goals. If you ever have questions or concerns about self-evaluations and grades, then I'm more more than willing to discuss them with you at any time.

4.1.1 Participation, Attendance, & Timely Work

I do not have strict attendance and deadline policies, per se, but I do have clear expectations. These expectations are baked into the dispositional attribute of the course competencies. This attribute includes things like being *professional, responsible, responsive, and self-directed.*

As far as I'm concerned, signing up for this class means you agree to coming to class and lab, being on time for class and lab, doing assigned work and submitting it on time, and generally participating in all the class has to offer. That being said, life happens and people have different priorities. You might need to miss class or extend a deadline. So long as you communicate with me about it, as a professional would with a co-worker, then we won't have a problem. If you simply skip class without warning, always show up late, or regularly fail to do assigned work in a timely manner, then I expect that those failures to meet dispositional expectations to be reflected in your self-evaluation.

There is one exception to my "no grade-based policy" on assignments and deadlines and that is the self-evaluations and reflections. The self-evaluation process is critical to this class and in no way optional. **If you fail attend the portfolio review meetings or always show up completely un-prepared then I reserve to give you a final grade of D or lower for the course.** You'll find I can be pretty relaxed about a lot of other assignments and deadlines, but I draw the line at the self-evaluation process.

4.2 Academic Honesty

We believe that academic honesty is of the utmost importance for the maintenance and growth of our intellectual community. At Monmouth College, the faculty and staff strive to create positive and transformational learning experiences. One step in our mission to provide excellent teaching involves our emphasis on the promotion of free inquiry, original thinking and the holistic development of our students. Monmouth College

strives to offer a learning environment which stresses a vigorous work ethic and stringent moral codes of behavior.

We believe that one of our core commitments is the fostering of personal and academic integrity. Our students are encouraged to think of the campus as an educational community with ties to the local, national and global society. Honesty in one's academic work is of the utmost importance for the maintenance and growth of the individual and of our intellectual community.

We therefore require all our students to contribute to this community of learners and to make a vigorous commitment to academic honesty. We view academic dishonesty as a threat to the integrity and intellectual mission of our institution. Any breach of the academic honesty policy—either intentionally or unintentionally—will be taken seriously and may result not only in failure in the course, but in suspension or expulsion from the College.

It is each student's responsibility to read, understand and comply with the general academic honesty policy at Monmouth College, as defined here in the Scots Guide, and to the specific guidelines for each course, as elaborated on the professor's syllabus.

The following areas are examples of violations of the academic honesty policy:

1. Cheating on tests, labs, etc;
2. Plagiarism, i.e., using the words, ideas, writing, or work of another without giving appropriate credit;
3. Improper collaboration between students, i.e., not doing one's own work on outside assignments specified as group projects by the instructor;
4. Submitting work previously submitted in another course, without previous authorization by the instructor.

Please note that this list is not intended to be exhaustive.

The complete Monmouth College Academic Honesty Policy can be found on the College web page. `https://www.monmouthcollege.edu/offices/student-affairs/academic-regulations/`

In this course, any violation of the academic honesty policy will have varying consequences depending on the severity of the infraction as judged by the instructor. Minimally, a violation will result in treating the assignment in question as if it were never completed. Additionally, the student's course grade may be lowered by one letter grade. In severe cases, the student will be assigned a course grade of "F" and dismissed from the class. All cases of academic dishonesty will be reported to the Associate Dean who may decide to recommend further action to the Admissions and Academic Status Committee, including suspension or dismissal. It is assumed that students will educate themselves regarding what is considered to be academic dishonesty, so excuses or claims of ignorance will not mitigate the consequences of any violations.

5 Academic Support and Accessibility

Academic Support

The Academic Support Office offers free resources to assist Monmouth College students with their academic success. Programs include Supplemental Instruction for classes, Drop-In and appointment tutoring, and individual Academic Coaching. Our Office is here to help all students excel academically, since every student can work toward better grades, practice stronger study skills, and manage their time better. Please email academicsupport@monmouthcollege.edu for assistance.

Accessibility

If you need course adaptions or accommodations because of a disability please make an appointment with the Accessibility Services Office (ASO) as soon as possible. Email: access@monmouthcollege.edu

Phone: 309-457-2257

The accessibility of this course for every learner is important to me. If at any time you experience a barrier to learning, please bring it to my attention and I will do my best to address it.

At any point in the semester, if you encounter difficulty with the course or feel you could be performing at a higher level, consult with me.

Tutoring is available for this course. The schedule will be announced when it is available.

6 Calendar

This calendar is subject to change based on the circumstances of the course. **Precise dates and other day-to-day details can be found on the course website.**

Week	Dates	Notes	Assignments Due	Chapter(s)
1	1/19 — 1/23		Lab 1.	1.1–1.6.
2	1/26 — 1/30		Lab 2. Hwk 1. Exam 1.	1.7–1.12
3	2/2 — 2/6		Project Lab.	1.13.
4	2/9 — 2/13		Project 1.	2.1–2.4
5	2/16 — 2/20		Lab 3. Hwk 2.	5, 2.4–2.7
6	2/23 — 2/27		Exam 2. Lab 4. Hwk 3.	3.1–3.10
7	3/2 — 3/6		Lab 5. Hwk 4. Exam 3.	3.10–3.14
	3/9 — 3/13	SPRING BREAK		
8	3/16 — 3/20		Lab 6. Hwk 5.	3.19–3.23
9	3/23 — 3/27		Exam 4. Lab 7.	3.15–3.18, 4.1–4.8
10	3/30 — 4/3	EASTER BREAK (F)	Project Lab. Hwk 5.	4.1–4.12
11	4/6 — 4/10	EASTER BREAK (M)	Project 2. Exam 5.	5.1–5.4,5.6–5.12
12	4/13 — 4/17		Lab 8.	5.6–5.12
13	4/20 — 4/24		Lab 9. Hwk 6.	5.6–5.12, 5.7
14	4/27 — 5/1	SCHOLAR'S DAY (Tu).	Project Lab. Exam 6.	6.1–6.7
15	5/4 — 5/8	READING DAY (Th).	Project 3.	6.8–6.15
	5/12		**EXAM 7. 5/8. 6:30-9:30 pm**	