



## Course Information

**Course Title:** Object Oriented Programming for Information Science

**Course Number:** INST326

**Term:** Fall 2004

**Credits:** 3

**Course Dates:** From August 26, 2024 - December 10, 2024

### Section Times and Classrooms

**Section 0104:** Lecture Tuesday 9:30 – 10:45 AM in CCC 100; Lab Thursday 9:30 – 10:45 in CCC 100;

**Section 0202:** Lecture Tuesday 5:00 – 6:15 PM ONLINE; Lab Thursday 2:00 – 3:15 PM in HBK 0109

**Professor:** C. Scott Dempwolf, PhD

**Pronouns:** he, him, his

**Email:** [dempy@umd.edu](mailto:dempy@umd.edu)

**Office Hours:** immediately after each lecture; Fridays by appointment

**Section 0201:** Lecture Tuesday 5:00 – 6:15 PM ONLINE; Lab Thursday 12:30 – 1:45 PM in HBK 0109

**Section 0203:** Lecture Tuesday 5:00 – 6:15 PM ONLINE; Lab Thursday 3:30 – 4:45 PM in HBK 0109

## Course Description

This course introduces object-oriented design and programming (OOP) concepts and methods using the Python programming language. Object-oriented programs are built as collections of “objects”, which are often software representations of real-world entities and concepts. Objects combine data (attributes) with functionality (methods), and work through communicating with each other as the code is executed. By encapsulating code complexity within objects, OOP allows use and reuse of existing code in a relatively simple and easy manner. Advanced OOP concepts such as inheritance and composition facilitate development of complex code without sacrificing robustness and possibility of code reuse. We apply computational thinking approaches such as abstraction, decomposition, algorithmic design, generalization, evaluation, and debugging.

This course includes a substantial review / introduction to Python programming language along with several widely used tools for programming both individually and as part of a team. For the first time this introduction will include a module on artificial intelligence (AI) literacy and the ethical use of AI tools to assist with programming tasks. Much of this introduction to programming technologies will take place in the background through self-paced course modules that students complete on their own. This allows class time to focus on Python and OOP, but it also reflects an important life / career reality that learning and keeping up with technology is a lifelong necessity that happens mostly in the background.

Finally, this course provides opportunities to develop an understanding of how programming is situated in and reflects broader social structures, constructs and issues, e.g. race, class or gender. Programming is often viewed as a value-neutral technical skill. However, the social and cultural impacts of information and technology are central concepts in our field, and the growing awareness of issues like algorithmic bias, ethical/unethical uses of algorithms and disparities in opportunities in tech jobs - require that any informed professional needs to understand the larger

context of programming. This is important to be ethical professionals and to be successful in the workplace. Through readings, discussion and writing, we will critically examine issues of racism, sexism and other forms of power and oppression that are pervasive in programming and related technical activities; and discuss what companies and individuals are doing to improve programming practices and professional work environments.

## Course Objectives

After successfully completing this course, you will be able to:

1. Use object-oriented programming principles, concepts, and methods.
2. Design and program object-oriented applications to solve non-trivial problems.
3. Write accurate and useful in-code comments and other code documentation.
4. Test and assess the quality of object-oriented code.
5. Use the concept of object-oriented design patterns and apply basic design pattern solutions to relevant programming problems.
6. Explain how programming is situated in and reflects social issues and concerns around diversity, inclusion, equality and justice, and describe actions that individuals or organizations are taking to counteract disparities and inequalities.

## Required Resources

Course Website: [elms.umd.edu](https://elms.umd.edu)

Our readings will come from a variety of free online sources; the main ones are listed below:

### Python for Everybody: Exploring Data Using Python 3

Charles R. Severance

<https://www.py4e.com/book>Links to an external site.

Download: [http://do1.dr-chuck.com/pythonlearn/EN\\_us/pythonlearn.pdf](http://do1.dr-chuck.com/pythonlearn/EN_us/pythonlearn.pdf)Links to an external site.

### The Python Tutorial

Guido van Rossum and the Python Software Foundation

<https://docs.python.org/3/tutorial/>Links to an external site.

Download: <https://docs.python.org/3/download.html>Links to an external site. (as part of the official Python documentation)

### Object-Oriented Programming in Python

University of Cape Town

<http://python-textbok.readthedocs.io/en/1.0/>Links to an external site.

Download: <https://media.readthedocs.org/pdf/python-textbok/1.0/python-textbok.pdf>Links to an external site.

All these sources can be downloaded for offline access. Download copies now so that you're prepared in the event of internet issues during the semester.

## Required Technology

Students will need a laptop with an internet browser.

Our primary technology platform for this course is Anaconda and Jupyter Notebook (available free at <https://www.anaconda.com/>). Refer to the Getting Started 3 – Technology page on ELMS for additional information and installation instructions.

We will also use Git and Github for the unit on collaborative programming and project 3. You will need to sign up for a free Github account (<https://github.com/>). Refer to the Getting Started 3 – Technology page on ELMS for additional information and installation instructions.

If you have technology issues or problems with your installations, please see a member of the teaching team for assistance.

## Course Structure

This syllabus covers four sections of INST326. Section 0104 has an in-person lecture and an in-person lab. Sections 0201, 0202, and 0203 have an ONLINE lecture and an in-person lab. All lectures are given by the professor on Tuesdays. All labs are typically taught by graduate assistants on Thursdays. Consult the schedule at the beginning of this syllabus and online for the times and rooms for your section.

The ELMS site, course content, assignments (discussions, labs, quizzes, and projects), and due dates will be the same for all sections. We will typically follow the course pattern below.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	12:00 AM - New weekly material posted; quizzes and discussion topics available	9:30am - 10:45am Section 0104 lecture (in person) Dr. Dempwolf office hours in person immediately after class		12:00 AM - Weekly lab assignments available 9:30am - 10:45am Section 0104 lab (in person)	Dr. Dempwolf office hours online by appt. times TBD.	
11:59 PM - Lab exercises due Quizzes due Projects due		5:00pm - 6:15pm Sections 0201, 0202, 0203 lecture (online synchronous) Dr. Dempwolf office hours online immediately after class	11:59 pm 1st discussion post due	12:30pm - 1:45pm Section 0201 lab (in person) 2:00pm - 3:15pm Section 0202 lab (in person) 3:30pm - 4:45pm Section 0203 lab (in person)	11:59 pm 2nd discussion post due	

## Tips for Success in an Online Course

1. **Participate.** Discussions and group work are a critical part of the course. You can learn a great deal from discussing ideas and perspectives with your peers and professor. Participation can also help you articulate your thoughts and develop critical thinking skills.
2. **Manage your time.** Make time for your online learning and participation in discussions each week. Give yourself plenty of time to complete assignments including extra time to handle any technology related problems.
3. **Login regularly.** Log in to ELMS-Canvas several times a week to view announcements, discussion posts and replies to your posts. You may need to log in multiple times a day when group submissions are due.
4. **Do not fall behind.** This class moves at a quick pace and each week builds on the previous. It will be hard to keep up with the course content if you fall behind in the pre-work or post-work.
5. **Use ELMS-Canvas notification settings.** Canvas ELMS-Canvas can ensure you receive timely notifications in your email or via text. Be sure to enable announcements to be sent instantly or daily.
6. **Ask for help if needed.** If you need help with ELMS-Canvas or other technology, IT Support. If you are struggling with a course concept, reach out to me, and your classmates, for support.

## Campus Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit [www.ugst.umd.edu/courserelatedpolicies.html](http://www.ugst.umd.edu/courserelatedpolicies.html) for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.

## Course-Specific Policies

### Academic Integrity

[insert AI policy here]

### Names/Pronouns and Self-Identifications

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering inclusive and equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit [trans.umd.edu](http://trans.umd.edu) to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

### **Communication with Instructional Team:**

Dr. Dempwolf leads a large and well-qualified instructional team that works together across all sections of this course. We have tried to anticipate many of your questions and concerns in the course materials on ELMS. Please read and refer to the syllabus and the ELMS course site regularly. We also communicate frequently through announcements on the ELMS / Canvas site so please check them regularly and especially before class.

Communicating with Dr. Dempwolf: Email me ([dempy@umd.edu](mailto:dempy@umd.edu)) or message me through ELMS. You can also see me after class (in-person or online). You can also schedule appointments for online office hours on Fridays.

#### **Your Instructional Team**

Professor: C. Scott Dempwolf, PhD [dempy@umd.edu](mailto:dempy@umd.edu)

#### Graduate Teaching Assistants

Benjamin Kotler [bkotler@umd.edu](mailto:bkotler@umd.edu)

Vaibhavi Hedao [vhedao@umd.edu](mailto:vhedao@umd.edu)

Jian Zheng [jzheng23@umd.edu](mailto:jzheng23@umd.edu)

James Van Doorn [jvand@umd.edu](mailto:jvand@umd.edu)

#### Undergraduate Teaching Assistants

Isabelle Thomas

Megan Cha

Ildreed Mbami

Dhruvi Kadhiwala

#### Graders

Hari Yadlapalli [haripyad@umd.edu](mailto:haripyad@umd.edu)

Siddhant Soymon [ssoymon@umd.edu](mailto:ssoymon@umd.edu)

Chaitanya Kulkarni [chaitkul@umd.edu](mailto:chaitkul@umd.edu)

Harshitha Kommaraju [harshiko@umd.edu](mailto:harshiko@umd.edu)

We have completed a skills inventory for the teaching team so that certain issues may be referred to the most knowledgeable person. In most cases that is a teaching assistant. In a few cases it is a grader.

Follow the guidance provided by the teaching team during the first week and we will ensure that you are connected with someone who can help you.

### **Communicating with the team**

Members of the teaching team will post office hours and instructions for communications by the end of the first week of class. Email is the default method of communication, however some students prefer other means of communication like discord, for example. If the teaching team chooses to offer this, they will let you know.

### **Discussions**

Each week you will have graded discussion questions to respond to. The teaching team will be reading and responding to discussion posts throughout the semester. Our goals are simple. First, to ensure that each student receives a response from a member of the teaching team at least every other week. Second, that every student receives at least one discussion response from Dr. Dempwolf during the semester.

### **Communication with Peers:**

With a diversity of perspectives and experience, we may find ourselves in disagreement and/or debate with one another. As such, it is important that we agree to conduct ourselves in a professional manner and that we work together to foster and preserve a virtual classroom environment in which we can respectfully discuss and deliberate controversial questions.

I encourage you to confidently exercise your right to free speech—bearing in mind, of course, that you will be expected to craft and defend arguments that support your position. Keep in mind, that free speech has its limit and this course is NOT the space for hate speech, harassment, and derogatory language. I will make every reasonable attempt to create an atmosphere in which each student feels comfortable voicing their argument without fear of being personally attacked, mocked, demeaned, or devalued.

Any behavior (including harassment, sexual harassment, and racially and/or culturally derogatory language) that threatens this atmosphere will not be tolerated. Please alert me immediately if you feel threatened, dismissed, or silenced at any point during our semester together and/or if your engagement in discussion has been in some way hindered by the learning environment.

## **Major Assignments**

### **Discussions**

Each week (after week 1) the discussion assignment will contain three questions. Each student will choose ONE of those questions for their initial discussion post. Initial posts are due by 11:59 PM on Wednesdays. Students will also be responsible for at least one response to another student's post. There will be 12 graded discussions worth 15 points each.

### **Quizzes**

Each week students will have a 20 – question quiz related to the topic for that week. You will be allowed two attempts. There will be a total of 10 quizzes worth 20 points each.

## Lab Exercises

Each week students will complete a set of lab exercises related to the topic for that week. Each set of 10 (typically) exercises will be available at 12:01 AM on Thursdays. Lab instructors will work through a few of them in class. Lab exercises are due Sundays at 11:59 PM. There will be 10 lab exercise assignments worth 30 points each.

## Projects

There will be four projects throughout the semester. Two will be individual projects and one will be a group project. The final project may be completed either individually or as a group. For each project, students will be presented with three or more possible projects and will choose ONE of those options for their project. While the options cover the same programming skills, they represent slightly different degrees of difficulty – allowing you to choose one that is right for you. Each project is worth 80 points.

## Grading Structure

Assignment	Percentage %
Discussions (12 x 15 points)	18%
Quizzes (10 x 20 points)	20%
Lab Exercises (10 x 30 points)	30%
Projects (4 x 80 points)	32%
<b>Total (1,000 points)</b>	<b>100%</b>

## Academic Integrity

The University's [Code of Academic Integrity](#) is designed to ensure that the principles of academic honesty and integrity are upheld. In accordance with this code, the Smith School does not tolerate academic dishonesty. Please ensure that you fully understand this code and its implications because all acts of academic dishonesty will be dealt with in accordance with the provisions of this code. All students are expected to adhere to this Code. It is your responsibility to read it and know what it says, so you can start your professional life on the right path. **As future professionals, your commitment to high ethical standards and honesty begins with your time at the Smith School.**

It is important to note that course assistance websites, such as CourseHero, are not permitted sources, unless the instructor explicitly gives permission for you to use one of these sites. Material taken or copied from these sites can be deemed unauthorized material and a violation of academic integrity. These sites offer information that might not be accurate and that shortcut the learning process, particularly the critical thinking steps necessary for college-level assignments.

Additionally, it is understandable that students may use a variety of online or virtual forums for course-wide discussion (e.g., GroupME or WeChat). Collaboration in this way regarding concepts discussed in this course is permissible. However, collaboration on graded assignments is strictly prohibited unless otherwise stated. Examples of prohibited collaboration include: asking classmates for answers on quizzes or exams, asking for access codes to clicker polls, etc.






Finally, on each exam or assignment you must write out and sign the following pledge:

**"I pledge on my honor that I have not given or received any unauthorized assistance on this exam/assignment."**

Please visit the [Office of Undergraduate Studies' full list of campus-wide policies](#) and follow up with me if you have questions.

To help you avoid unintentional violations, *the following table* lists levels of collaboration that are acceptable for each type of assignment. If you ever feel pressured to comply with someone else's academic integrity violation, please reach out to me straight away. Also, **if you are ever unclear** about acceptable levels of collaboration, **please ask!**

The following table lists levels of collaboration that are acceptable for each type of graded exercise. See each CANVAS-ELMS page for academic integrity expectations for each individual assignment. If you are ever unsure about acceptable levels of collaboration, please ask!

	 OPEN NOTES	 USE BOOK	 SEARCH ONLINE	 ASK FRIENDS	 WORK IN GROUPS
Homework Assignments	✓	✓	✓	✗	✗
Quizzes & Weekly Summaries	✓	✓	✓	✗	✗
Team Project	✓	✓	✓	✓	✓
Final Exam	✓	✓	✗	✗	✗

### Grades

Campus Policy dictates that you must specify:

- How final letter grades will be determined. This should include a breakdown of all graded assessments, their weight in the course, and whether final grades will include +/- descriptors.
- How students will have access to their grades throughout the semester, and how they can review their work (including the final exam).

All assessment scores will be posted on the course ELMS page. If you would like to review any of your grades (including the exams), or have questions about how something was scored, please email me to schedule a time for us to meet and discuss.

Late work will not be accepted for course credit so please plan to have it submitted well before the scheduled deadline. I am happy to discuss any of your grades with you, and if I have made a mistake I will immediately correct it. Any formal grade disputes must be submitted in writing and within one week of receiving the grade.

Final letter grades are assigned based on the percentage of total assessment points earned. To be fair to everyone I have to establish clear standards and apply them consistently, so please understand that



being close to a cutoff is not the same as making the cut (89.99 ≠ 90.00). It would be unethical to make exceptions for some and not others.

A table of the assessments and point values can be a concise way to convey all of the graded elements and their relative weight in the course. If you are using weighted percentages (e.g., exams = 30%, paper = 20%) be sure to clarify the number of assessments within each category... is there one exam worth 30% or are there three exams that are each worth 10.

It is essential that you articulate in your syllabus how final letter grades will be assigned. The meaning of letter grades is [established here](#). There is no campus policy on percentages and letter grades, nor is there a requirement that you utilize a points-based scheme. Here is one sample, which you are welcome to use or edit to reflect your grading policies:

Final Grade Cutoffs									
+	97.00%	+	87.00%	+	77.00%	+	67.00%	+	
A	94.00%	B	84.00%	C	74.00%	D	64.00%	F	<60.0%
-	90.00%	-	80.00%	-	70.00%	-	60.00%	-	

## Course Outline

The format of this section will vary based on the design of your course and the semester, but our guidance is to aim for a clear and concise table that maps out all of the assignment assessments and deadlines and gives students a sense of the course’s organization.

Week #	Topic	Deliverable
1	Course overview; technology setup; OOP in Context	Introduce yourself, complete installations
2	Python review part 1 (variables, operators, data types, functions)	Discussion, quiz, lab
3	Python review part 2 (collections, mutability, conditionals, loops)	Discussion, quiz, lab
4	Python Input / output (files, file types, databases, web apis)	Discussion, quiz, lab
5	Python Classes and objects, modules	Discussion, quiz, lab, project 1
6	Python user interactions and GUIs	Discussion, quiz, lab
7	Collaborative programming	Discussion, quiz, lab, project 2
8	Pillars of OOP Overview	
9	Pillars of OOP: abstraction and encapsulation	Discussion, quiz, lab

10	Pillars of OOP inheritance and polymorphism	Discussion, quiz, lab
11	OOP in Practice	Discussion, quiz, lab, project 3
12	OOP in Practice	Discussion, quiz, lab
13	OOP in Practice	Discussion
14	Thanksgiving Break – no class	
15	Course wrap; OOP as a framework for problem solving	
16	No class. Final project due.	Final project due

Note: This is a tentative schedule, and subject to change as necessary – monitor the course ELMS page for current deadlines. In the unlikely event of a prolonged university closing, or an extended absence from the university, adjustments to the course schedule, deadlines, and assignments will be made based on the duration of the closing and the specific dates missed.

## Resources & Accommodations

### Accessibility and Disability Services

The University of Maryland is committed to creating and maintaining a welcoming and inclusive educational, working, and living environment for people of all abilities. The University of Maryland is also committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to discrimination. The [Accessibility & Disability Service \(ADS\)](#) provides reasonable accommodations to qualified individuals to provide equal access to services, programs and activities. ADS cannot assist retroactively, so it is generally best to request accommodations several weeks before the semester begins or as soon as a disability becomes known. Any student who needs accommodations should contact me as soon as possible so that I have sufficient time to make arrangements.

For assistance in obtaining an accommodation, contact Accessibility and Disability Service at 301-314-7682, or email them at [adsfrontdesk@umd.edu](mailto:adsfrontdesk@umd.edu). Information about [sharing your accommodations with instructors](#), [note taking assistance](#) and more is available from the [Counseling Center](#).

### Student Resources and Services

Taking personal responsibility for your own learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come talk to me so that I can help you find the right approach to success in this course, and I encourage you to visit [UMD's Student Academic Support Services website](#) to learn more about the wide range of campus resources available to you.

In particular, everyone can use some help sharpen their communication skills (and improving their grade) by visiting [UMD's Writing Center](#) and schedule an appointment with the campus Writing Center.

You should also know there are a wide range of resources to support you with whatever you might need ([UMD's Student Resources and Services website](#) may help). If you feel it would be helpful to have someone to talk to, visit [UMD's Counseling Center](#) or [one of the many other mental health resources on campus](#).

### **Basic Needs Security**

If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live, please visit [UMD's Division of Student Affairs website](#) for information about resources the campus offers you and let me know if I can help in any way.

### **Technology Policy**

Please refrain from using cellphones, laptops, and other electronic devices during class sessions unless we have designated such use as part of a class exercise.

### **Netiquette Policy [Optional]**

Netiquette is the social code of online classes. Students share a responsibility for the course's learning environment. Creating a cohesive online learning community requires learners to support and assist each other. To craft an open and interactive online learning environment, communication has to be conducted in a professional and courteous manner at all times, guided by common sense, collegiality and basic rules of etiquette.

### **Participation**

- Given the interactive style of this class, attendance will be crucial to note-taking and thus your performance in this class. Attendance is particularly important also because class discussion will be a critical component for your learning.
- Each student is expected to make substantive contributions to the learning experience, and attendance is expected for every session.
- Students with a legitimate reason to miss a live session should communicate in advance with the instructor, except in the case of an emergency.
- Students who miss a live session are responsible for learning what they miss from that session.
- Additionally, students must complete all readings and assignments in a timely manner in order to fully participate in class.

### **Course Evaluation**

Please submit a course evaluation through CourseEvalUM in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to CourseEvalUM is confidential. Campus will notify you when CourseEvalUM is open for you to complete your evaluations for fall semester courses. Please go directly to the [Course Eval UM website](#) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing through Testudo, the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

### **Copyright Notice**

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