CS 105 Introduction to Scientific Computing

Department of Computer Science

Fall 2024

Instructor: William Hendrix

Canvas Course Address: https://sit.instructure.com/courses/73549

Course Schedule: Tuesdays and Thursdays, 9:30-10:20 am

Contact Info: whendrix@stevens.edu

In-person Office Hours (GS 251): Mondays and Wednesdays, 3:30-4:30 pm

CAs: Lucas Hope and Esat Adiloglu

CA Office Hours (Lucas): Mondays 6:30-8:30 pm in Gateway South 348

CA Office Hours (Esat): Tuesdays 7:00-9:00 pm in Gateway South 347

Prerequisite(s): none

Corequisite(s): none

Cross-listed with: none

COURSE DESCRIPTION

This is a first course in computer programming for students with no prior experience. Students will learn the core process of programming: given a problem statement, how does one design an algorithm to solve that particular problem and then implement the algorithm in a computer program? The course will also introduce elementary programming concepts

like basic control concepts (such as conditional statements and loops) and a few essential data types (e.g., integers and doubles). Exposure to programming will be through a self-contained user-friendly programming environment, widely used by the scientific and engineering communities, such as Python or MATLAB. The course will cover problems from all fields of science, engineering, and business.

STUDENT LEARNING OUTCOMES

After successful completion of this course, students will be able to…

- Declare and manipulate data with different data types
- Read and write data from and to files and be able to plot data
- Develop, implement, and debug programs that solve basic problems such as simulating a damped harmonic oscillator or finding the occurrences of a given string in a file
- Write code that uses recursion; e.g., for calculating continued fractions
- Demonstrate basic debugging skills

COURSE FORMAT AND STRUCTURE

This course is on-campus. To access the course, please visit stevens.edu/canvas. For more information about course access or support, contact the Technology Resource and Assistance Center (TRAC) by calling 201-380-6599.

COURSE MATERIALS

Textbook(s): Lambert, Kenneth A. *Fundamentals of Python: First Programs*, 3rd ed. Cengage, 2024. ISBN-13 978-0-357-88101-9

Zelle, John. *Python Programming: An Introduction to Computer Science*, 3rd ed. Franklin, Beedle & Associates, 2024. ISBN-13 978-1590282977

COURSE REQUIREMENTS

Attendance

Outside of exam days, class attendance is strongly encouraged but not required.

Participation

Class participation is encouraged, and those who volunteer their answers to in-class exercises (correctly or incorrectly) will be eligible for bonus credit.

Homework

All labs and homework will be assigned and submitted via Canvas.

Exams

There will be two exams, a midterm and final exam. The midterm exam will be held on Thursday, October 10, and the final exam will be held at **8:00-11:00 am on Tuesday, December 17**, in our usual classroom (North 105). The final exam will be cumulative. There will be optional review sessions for both exams in the week before these exams. More information about these sessions will be announced later in the course.

GRADING PROCEDURES

Grades will be based on:

Homework	10%
Labs	40%
Midterm Exam	25%
Final Exam	25%

Grading scale

Score	Grade
>= 93	A
90-92	A-

87-89 B+

83-87 B

80-82 B-

77-79 C+

73-77 C

70-72 C-

60-69 D

0-59 F

Late Policy

Missed exams or assignments will not be made up without confirmation of a serious medical issue, family emergency, or major religious observances. Students who know they will not be able to attend class should notify the instructor as soon as possible in order to develop contingency plans. The instructor may, at his discretion, provide make-up assignments, extended deadlines, or other remedies for those with excused absences.

Academic Integrity

Undergraduate Honor System

Enrollment into the undergraduate class of Stevens Institute of Technology signifies a student's commitment to the Honor System. Accordingly, the provisions of the Stevens Honor System apply to all undergraduate students in coursework and Honor Board proceedings. It is the responsibility of each student to become acquainted with and to uphold the ideals set forth in the Honor System Constitution. More information about the Honor System including the constitution, bylaws, investigative procedures, and the penalty matrix can be found online at http://web.stevens.edu/honor/

The following pledge shall be written in full and signed by every student on all submitted work (including, but not limited to, homework, projects, lab reports, code, quizzes and exams) that is assigned by the course instructor. No work shall be graded unless the pledge is written in full and signed.

"I pledge my honor that I have abided by the Stevens Honor System."

Reporting Honor System Violations

Students who believe a violation of the Honor System has been committed should report it within ten business days of the suspected violation. Students have the option to remain anonymous and can report violations online at www.stevens.edu/honor.

Generative AI Technologies

The use of generative AI is permitted to help generate ideas on homework and projects. Be aware that these systems may generate false assertions (hallucinations), especially in specialized domains. Overreliance on generative AI may also limit your ability to think critically.

You may not submit work generated by AI as your own. If you include material generated by AI, you should include a citation to the AI system and make clear which parts of your answer were developed by AI. Any plagiarism or other form of cheating will be dealt with under relevant Stevens policies.

LEARNING ACCOMMODATIONS

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/student-diversity-and-inclusion/disability-services. If you have any questions please contact the Office of Disability Services at disabilityservices@stevens.edu or by phone: 201.216.3748.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies.

INCLUSIVITY

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Name and Pronoun Usage

As this course includes group work and class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your pronouns and/or name, please inform the instructor of the necessary changes.

Religious Holidays

Stevens is a diverse community that is committed to providing equitable educational opportunities and supporting students of all ethnicities and belief systems. Religious observance is an essential reflection of that rich diversity. Students will not be subject to any grade penalties for missing a class, examination, or any other course requirement due to religious observance. In addition, students will not be asked to choose between religious observance and academic work. Therefore, students should inform the instructor at the beginning of the semester if a requirement for this course conflicts with religious observance so that accommodations can be made for students to observe religious practices and complete the requirements for the course.

MENTAL HEALTH RESOURCES

Part of being successful in the classroom involves a focus on your whole self, including your mental health. While you are at Stevens, there are many resources to promote and support mental health. The Office of Counseling and Psychological Services (CAPS) offers free and confidential services to all enrolled students who are struggling to cope with personal issues (e.g., difficulty adjusting to college or trouble managing stress) or psychological difficulties (e.g., anxiety and depression). Appointments can be made by phone (201-216-5177), online at https://stevensportal.pointnclick.com/confirm.aspx, or in person on the 2nd Floor of the Student Wellness Center.

EMERGENCY INFORMATION

In the event of an urgent or emergent concern about your own safety or the safety of someone else in the Stevens community, please immediately call the Stevens Campus Police at 201-216-5105 or on their emergency line at 201-216-3911. These phone lines are staffed 24/7, year-round. For students who do not reside near the campus and require emergency support, please contact your local emergency response providers at 911 or via your local police precinct. Other 24/7 national resources for students dealing with mental health crises include the National Suicide Prevention Lifeline (1-800-273-8255) and the Crisis Text Line (text "Home" to 741-741). If you are concerned about the well-being of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at care@stevens.edu. A member of the CARE Team will respond to your concern as soon as possible.

TENTATIVE COURSE SCHEDULE

Week	Topic(s)
Week 1	Programming basics Variables

Week 2	Branching
Week 3	Loops
Week 4	Functions
Week 5	Strings Lists
Week 6	Review and Midterm Exam
Week 7	Dicts
Week 8	Files
Week 9	Object-oriented programming
Week 10	Libraries
Week 11	Inheritance
Week 12	Exceptions
Week 13	GUI programming
Week 14	Additional topics
Week 15	Final Exam review