CS 515-A Fundamentals of Computing

Schaefer School of Engineering & Science — Department of Computer Science

# COURSE DESCRIPTION

This is an introduction to computer science with an emphasis on programming, in Python. The topics include: design; algorithmic thinking; recursion; object-oriented programming; and some basics about computer systems: machine language, interpreters, compilers, and data representation. Undergraduates are not allowed to enroll.

# STUDENT LEARNING OUTCOMES

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

* Read a Python program, both at the syntactic level (what are the building blocks of the program?) and the semantic level (what is the program doing?)
* Characterize Python values and their types, particularly for builtin types (Booleans, numbers, dictionaries, lists)
* Simulate how a Python program would run, using a variety of features: conditionals, iteration and recursion, exceptions, heap and stack allocations, and method invocation
* Construct, document, and test Python programs that follow a given design
* Read Python documentation and construct programs that use the documented tools correctly
* Given a problem description, identify the parts one would need to solve the problem and sketch a design (as pseudocode or a flowchart)

# COURSE FORMAT AND STRUCTURE

This course is on-campus. To access the course, please visit [stevens.edu/canvas](http://stevens.edu/canvas).

The course materials—textbook, assignments, Q&A, etc.—will be on EdStem.

## Course Logistics

The material is *very* cumulative, and it’s easy to get behind without realizing it! In any case, labs are part of your grade and they are due the day after lab.

# TENTATIVE COURSE SCHEDULE

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| Week or Module | Date | Topic(s) | Assignment |
| Week 1 |  | Expressions |  |
| Week 2 |  | Functions | Assignment #1 |
| Week 3 |  | Conditionals, lists | Assignment #2 |
| Week 4 |  | Quiz  References, objects, methods |  |
| Week 5 |  | Loops | Assignment #3 |
| Week 6 |  | Incremental coding | Assignment #5 |
| Week 7 |  | Incremental coding | Assignment #6 |
| Week 8 |  | Midterm Exam |  |
| Week 9 |  | Nested loops | Assignment #7 |
| Week 10 |  | Images | Assignment #8 |
| Week 11 |  | Dictionaries  Quiz | Assignment #9 |
| Week 12 |  | File I/O |  |
| Week 13 |  | Algorithms: searching, shuffling, sorting  Working with data | Assignment #10 |
| Week 14 |  | Review |  |
| Week 15 |  | Final Exam |  |
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# COURSE MATERIALS

Materials: On EdStem

# COURSE REQUIREMENTS

There are four graded components to this course: assignments, quizzes, midterm, and a final.

Assignments submission will be via EdStem. The current plan is for the exams to be done in person.

# TECHNOLOGY REQUIREMENTS

I expect you to be able to use your computer, web browser, email, and video conferencing software proficiently.

This is a course about learning about computing fundamentals—there is *so much* to learn! The course material will touch on the core ideas underpinning computation, but that is really only the beginning. Curiosity and diligence will serve you well.

# GRADING PROCEDURES

The course grade breakdown will be:

* Quizzes: 10%
* Assignments: 50%
* Midterm: 20%
* Final: 20%

Some parts of the syllabus can be updated as the semester goes on.

While it’s possible for me to tell you how you’re doing in the course, I can’t tell you what “grade” you have—I only assign letter grades at the end of the semester.

## Late Policy

It will be a penalty 20% for each week of past due submitted homeworks.

## Academic Integrity

### **Graduate Student Code of Academic Integrity**

All Stevens graduate students promise to be fully truthful and avoid dishonesty, fraud, misrepresentation, and deceit of any type in relation to their academic work. A student’s submission of work for academic credit indicates that the work is the student's own. All outside assistance must be acknowledged. Any student who violates this code or who knowingly assists another student in violating this code shall be subject to discipline.

All graduate students are bound to the Graduate Student Code of Academic Integrity by enrollment in graduate coursework at Stevens. It is the responsibility of each graduate student to understand and adhere to the Graduate Student Code of Academic Integrity. More information including types of violations, the process for handling perceived violations, and types of sanctions can be found at [www.stevens.edu/provost/graduate-academics](http://www.stevens.edu/provost/graduate-academics).

# EXAM CONDITIONS

It will be no monitoring software during exams.

For in class exams, no allowing notes of any kind.

In the event that we have a take home exam, I will allow use of notes, the textbook, and Python documentation—but nothing else.

# LEARNING ACCOMODATIONS

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 in order 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/office-disability-services>. If you have any questions please contact: Phillip Gehman, the Director of Disability Services Coordinator at Stevens Institute of Technology at [pgehman@stevens.edu](mailto:pgehman@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

## 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 name and/or pronouns, please inform the instructor of the necessary changes.

## Inclusion Statement

Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements.

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

# 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 are can be made by phone (201-216-5177).

# EMERGENCY INFORMATION

In the event of an urgent or emergent concern about the safety of yourself or 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 wellbeing of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at [care@stevens.edu](mailto:care@stevens.edu). A member of the CARE Team will respond to your concern as soon as possible.