Course Information:

- SSW 500-B Introduction to Software Development (Fall 2023)
  - Class time: Thursday 3:30 pm – 6:00 pm
  - Location: Burchard 514

Instructor:

- Dr. Nafiseh Ghorbani
  - Email: nghorban@stevens.edu
  - Office: North Building 213
  - Office hour: Tuesday 3:00 pm – 4:00 pm
  - Virtual office hour: https://stevens.zoom.us/j/98591928596

Teaching Assistant:

- Yefeng Liang
  - Email: yliang32@stevens.edu
  - Office hour: Thursday 1:00 pm – 2:00 pm
  - Virtual office hour: https://us04web.zoom.us/j/5970533847?pwd=sVjEddNpq0XNhk78M7lGWabfBAaT0M.1

Required Platform:

Canvas.stevens.edu and stevens.zoom.us (Log in with your Stevens username and password). Supplementary information for the course is available at Canvas including the course syllabus, class announcements and notes, test dates, PowerPoint slides, assignments, and other information. Students are responsible for checking the announcements and reading the course material posted on Canvas. The instructor and teaching assistant will not be able to help with issues with the Canvas platform or any other technology.

Course Overview:

This course introduces the student to Object Oriented analysis, design, and programming with Python and covers several related software development tools and techniques that are critical for success as a member of software engineering team. The course begins with an introduction to Object Oriented Design and programming with Python. We also explore collaborative source code and project management with GitHub, along with software analysis, debugging, testing, and

refactoring techniques. Finally, relational and NoSQL database technologies are also introduced. The course is very hands-on, and students will practice their new skills with quizzes, homework assignments, and a final project that requires the successful student to use all the tools and techniques discussed in the class. Students will also develop an appreciation for continuous learning that is critical to keep up with the rapid pace of technological change.

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

- Define software requirements with use cases.
- Create, test, and debug complex Python programs.
- Explain and apply Object Oriented Analysis and Design including abstraction, single and multiple inheritance, and encapsulation.
- Explain software development best practices including coding standards.
- Perform static analysis of Python programs to reduce the probability of bugs and to improve the readability and maintainability of the code.
- Describe software testing strategies and techniques.
- Perform test-first development with a unit testing framework such as pyTest
- Evaluate and apply third party software packages to encourage faster delivery with off the shelf solutions.
- Create and use relational databases with queries and Python code.
- Independently evaluate new software technologies and tools
- Construct tailored agile processes that best fit the technical and market demands of a modern software project.

Prerequisites:

It would be desirable that students are comfortable with **Python programming language**.

Required Textbook:

- How to Think Like a Computer Scientist: Learning with Python, Downey, A., Elkner, J., Meyers, C., Wellesley, Massachusetts.
- Fundamentals of Python: First Programs (2nd Edition), Lambert, k. (2018). Cengage Learning, ISBN-13: 978-1-337-56009-2.

Recommended textbook:

- Python for Data Analysis (2nd Edition), McKinney, W. (2017). O'Reilly Media Inc, ISBN: 9781491957653.

Evaluation and Grading:

Weekly lectures, assignments, quizzes, exams, and a final project form the core of the course. Students should participate in weekly lectures. In case of **missing a lecture**, instructor **should receive** a prior **email**.

The evaluation will be based on the following criteria:

- **Assignments:** In general, homework problems are assigned every two weeks based on the covered material. The due date of assignments will be at **the beginning of class** the following week after the assignment unless otherwise announced. All assignments must

be uploaded to the Canvas platform by the due date and time provided on **the first page** of assignment. All assignments must be uploaded in the **format of PY**. The solutions to the programming problems should include full working code, not just an output of your program. Solutions should have a logical order. Some homework problems may require the submission of handwritten notes which will be notified. Certain naming standard will be required for homework submissions, where X is the assignment number: hwX_lastname_firstname. Ensure your familiarity with the Canvas platform in advance and allot enough time for assignment submission and any technical difficulties that may arise. Written homework should be finished individually, discussions with other students or instructor are allowed, but copying or any other type of cheating is strictly prohibited. **Note that late assignments will be graded with 50% penalty.**

- **Quizzes:** Every homework assignment will generally be followed by a quiz that will be over Canvas during the regular class time. Quizzes will be announced one session in advance. Quizzes might be in the form of multiple-choice questions. Collaboration with other students is not allowed when working on the exams and quizzes. **Missing a quiz** will result in **a zero grade.** Note: Python reference sheet posted on Canvas will be open for exams and quizzes.

- **Exams:** Two term exams and a final exam will be given in this course. Term exams will be during the regular class time. Collaboration with other students is not allowed when working on the exams and quizzes. Any suspicious activity will result in a zero grade for the exam. Term exam dates will be announced at least two weeks in advance. **Missing** an exam without substantial **prior notification** will result in a **zero grade**. Note: **Python reference sheet** posted on Canvas will be open for exams and quizzes.

  Final exam will be comprehensive. The final exam has not been scheduled yet and students are advised to check out the following website for the final exam date: https://www.stevens.edu/directory/office-registrar/final-exam-schedule

- **Final Project:** Students will be required to build a team (3 team members maximum), select a project (e.g., game, design a webpage), program it, and make **a fifteen-minute presentation in class**. Project titles will be notified over the **second half** of the course. The project will likely require students to identify, model, solve, and report on a problem that they encounter in their work/research/real life. A one-page project proposal briefing the anticipated project will be due at a date to be determined and is subject to approval by the instructor.

The grading and grading scale will be based on the following tables:

- **Grading:** The evaluation will be based on the following criteria and weights. Students are expected to abide by the Stevens Honor Code in submitting assignments and projects. Grades might be curved at the end of the semester.

Criteria	Weights (%)
Homework	20
Quizzes	10
Term exams	30
Final exam	25
Group project	15

- **Grading Scale:**

Grades	Percentages (%)
A	93-100
A-	90-92.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	77-79.9
C	73-76.9
C-	70-72.9
F	< 70

Notes:

- Grades may be curved at the end of the semester
- Make-up exams will be provided to the student if there is a situation of unavoidable emergency. This requires a written excuse. If you do not submit a quiz/exam with no explanation in advance, you will receive zero.

Tentative Outline (subject to change)

The following is a tentative outline for the course - we will probably change things as we proceed depending upon the progress, we are able to make.

Week	Class Date	Lecture Topics	Chapters
1	Thursday, September 7	Administrative Preliminaries, Python Fundamentals, Functions and Conditions	1, 2, 4, 5, and 6
2	Thursday, September 14	Iteration	7
3	Thursday, September 21	Strings and Coding Style Guidelines	8
4	Thursday, September 28	Containers 1: Lists	11
5	Thursday, October 5	Containers 2: Tuples, Dictionaries, and Sets	9 and 20
6	Thursday, October 12	Parameters, Modules, Files, Web	12 and 13
7	Thursday, October 19	Classes and exceptions	15, 16, and 19
8	Thursday, October 26	Advanced topics	Lecture Notes
9	Thursday, November 2	Testing and debugging	6
10	Thursday, November 9	Refactoring and configuration management	Lecture Notes

11	Thursday, November 16	Intro to SQL	Lecture Notes
12	Thursday, November 23	Thanksgiving Recess; No Classes	-
13	Thursday, November 30	Intro to web solutions with Flask	14
14	Thursday, December 7	Intro to NoSQL	Lecture Notes
15	Thursday, December 14	Project Presentations	-

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 (Links to an external site.).

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 by 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 (Links to an external site.).

Special Provisions for Undergraduate Students in 500-level Courses

The general provisions of the Stevens Honor System do not apply fully to graduate courses, 500 level or otherwise. Any student who wishes to report an undergraduate for a violation in a 500-level course shall submit the report to the Honor Board following the protocol for undergraduate courses, and an investigation will be conducted following the same process for an appeal on false accusation described in Section 8.04 of the Bylaws of the Honor System. Any student who wishes to report a graduate student may submit the report to the Dean of Graduate Academics or to the Honor Board, who will refer the report to the Dean. The Honor Board Chairman will give the Dean of Graduate Academics weekly updates on the progress of any casework relating to 500-level courses. For more information about the scope, penalties, and procedures pertaining to undergraduate students in 500-level courses, see Section 9 of the Bylaws of the Honor System (Links to an external site.) document, located on the Honor Board website.

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 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.

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 the 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.

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 or by phone (201) 216-3748.

Inclusivity:

Name and Pronoun Usage

As this course includes group work and in-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.

Students are responsible for any changes/additions to this syllabus announced on Canvas.