SSW 810WS Software Development Tools and Techniques

School of Systems and Enterprises

Summer 2020

Meeting Times: WebCampus: at your convenience

Classroom Location: WebCampus

Instructor: Raz Saremi

Contact Info: rsaremi@stevens.edu

Office Hours: Wednesday 6:00-7:00 PM or by appointment **Course Web**

Address: https://sit.instructure.com/courses/38206 **Prerequisite(s):**

None

Corequisite(s):

Cross-listed with: NA

COURSE DESCRIPTION

Software development skills are critical for most academic and professional positions. This course introduces the student to Object Oriented analysis, design, and programming with Python and covers a number of 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 weekly quizzes, homework assignments, and a final project that requires the successful student to use all of 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.

LEARNING OBJECTIVES

After taking this course, the student 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

FORMAT AND STRUCTURE

Weekly lectures, quizzes, homework and a final project form the core of the course. Students will be expected to attend weekly lectures and complete weekly reading assignments, quizzes, and homework assignments along with a development project. A final examination is administered to insure student mastery of the subject matter.

COURSE MATERIALS

Textbook: How to Think Like a Computer Scientist plus a variety of articles and web pages that will be assigned weekly.

COURSE REQUIREMENTS

1. Weekly reading assignments
2. Weekly quizzes covering the material in the lecture and readings for that week
3. Weekly programming assignments to gain practical experience working with software engineering methods, tools, and techniques.
4. Final examination

Students are expected to answer questions on all assignments, quizzes and exams in their own words. Similarly, students are expected to produce their own source code on programming assignments. Copying from other sources will not be tolerated and a 0 grade will be assigned for that assignment.

LATE ASSIGNMENTS

All quizzes and assignments are expected to be handed in on time. A 5% penalty will be assessed for each day the assignment is late. If you encounter extenuating circumstances, please contact the instructor BEFORE the assignment is due.

GRADING PROCEDURES

Quizzes	25%
Homework	35%
Final Exam	40%
Total	100%

Final grades will be determined by the following scale:

Grade	Score
A	94 <= score <= 100
A-	90 <= score < 94
B+	87 <= score < 90
B	84 <= score < 87
B-	80 <= score < 84
C+	77 <= score < 80
C	70 <= score < 77
F	< 70

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 (Links to an external site.). 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/ (Links to an external site.)

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 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 (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.

EXAM ROOM CONDITIONS

The following procedures apply to quizzes and exams for this course. As the instructor, I reserve the right to modify any conditions set forth below by printing revised Exam Room Conditions on the quiz or exam.

1. Students may use the following devices during quizzes and/or Any electronic devices that are not mentioned in the list below are not permitted.

Device	Permitted?	
	Yes	No
Laptops	x	

Cell Phones	x
Tablets	x
Smart Watches	x
Google Glass	x
Other	x

2. Students may use the following materials during quizzes. Any materials that are not mentioned in the list below are not permitted.

Material	**Permitted?** Yes	No
Handwritten Notes *Conditions*:	x	
Typed Notes *Conditions*:	x	
Textbooks *Conditions*:	x	
Readings *Conditions*:	x	
Other (specify)		

3. Students are/are not allowed to work with or talk to other students during quizzes and/or exams.

Specific Parameters:

LEARNING ACCOMODATIONS

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. Student Counseling and Disability Services works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, and psychiatric disorders 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 SCDS staff. The SCDS staff will facilitate the provision of accommodations on a case-by-case basis. These academic accommodations are provided at no cost to the student.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the office of Student Counseling, Psychological & 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.

For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/sit/counseling/disability-services (Links to an external site.). If you have any questions please contact:

Lauren Poleyeff, Psy.M., LCSW - Diability Services Coordinator and Staff Clinician in Student Counseling and Disability Services at Stevens Institute of Technology at lpoleyef@stevens.edu or by phone **(201) 216-8728.**

INCLUSIVITY STATEMENT

Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in education and innovation. Our community represents a rich variety of backgrounds, experiences, demographics and perspectives and Stevens is committed to fostering a learning environment where every individual is respected and engaged. To facilitate a dynamic and inclusive educational experience, we ask all members of the community to:

- be open to the perspectives of others
- appreciate the uniqueness their colleagues
- take advantage of the opportunity to learn from each other
- exchange experiences, values and beliefs
- communicate in a respectful manner
- be aware of individuals who are marginalized and involve them
- keep confidential discussions private