Graduate Programs in Software

University of St. Thomas

***St. Paul, MN 55105***

#### *Course Syllabus*

#### Foundations of

#### Software Development

#### - Python

**Fall Semester 2019**

**SEIS 603 (3 semester credits)**

**Section 03 (Course ID # 41947)**

**September 4 – December 11, 2019**

**Wednesday evenings**

**5:45 PM – 9:00 PM**

***Professor***

Eric V. Level

***Email Address***

**evlevel@stthomas.edu**

***PLEASE*** *put ‘****603 -****’ at start of subject line of any email to me*.

If you **don't** start your subject line this way, I may not respond to your email.

***Classroom***

O'Shaughnessy Science Center 428 (OSS 428)

***Course Hours***

We meet on Wednesday evenings, 5:45 PM – 9:00 PM. Our class meets 14 times: 9/4, 9/11, 9/18, 9/25, 10/2, 10/9, 10/16, 10/23, 10/30, 11/6, 11/13, 11/20, 12/4, and 12/11. Note we do NOT meet on 11/27 (Thanksgiving Eve), as part of November's Thanksgiving Break.

Details about each class meeting are found in the Class Schedule, which is a separate document posted on our course Canvas site.

The Fall 2019 GPS Calendar is here: <https://www.stthomas.edu/gradsoftware/current/calendar/#d.en.121083>

***Office and Office Hours***

My office is OSS 316, with office phone **651-962-5757**. Leave voicemail on my office phone if you wish, but email is usually the best way to contact me. **Again, *PLEASE put '603 –' at the beginning of the subject line in any class-related emails*.**

Office hours are scheduled **from 4:30 PM - 5:30 PM on Mondays, Tuesdays, Wednesdays, Thursdays**, **and Fridays**, just before my evening classes. My Tuesday office hour is held in the TMH 254 classroom on the Minneapolis campus, and those on other days are held in my St. Paul OSS 316 office. I can also help students after class, and you may also obtain help by appointment.

My mobile phone is 651-890-6649. I don't usually answer it directly, but you can leave voice mail. Also, if you want help with specific Python coding problems, you can take a picture of your computer screen and send it to me as an attachment to a text message. **Identify yourself in the message**. I'll look at your code and respond as soon as I can. Often this will get you a quicker response than email.

Another possibility is to join one of my Zoom remote sessions, where you can interact with me using UST's Zoom video conferencing tool. This allows us to view each other's remote desktop, as well as hear each other's audio. I will be running Zoom sessions during my office hours, as well as during class; the latter will allow students to view the close-up details of my projected laptop demonstrations.

***Prerequisites***None.

***Rights of Modification***:

**I may modify this Syllabus at any time**. If so, I will tell you about the changes in class and post the updated Syllabus and an Announcement on Canvas, describing the changes.

***Course Description***

This is an introductory software development course, with focus on fundamental and foundational software development concepts and their application using the Python programming language. General approaches to problem solving and algorithm creation are introduced, along with software development techniques including debugging and testing. Students write multiple interactive Python programs and scripts using objects, operators, dynamic typing, control flow, functions, and modules. Core data types are covered, including numbers, Booleans, strings, lists, dictionaries, tuples, and sets. Modules within the Standard Library are introduced, as well as other modules useful in data science. No previous programming experience in Python or any other programming language is required.

***Learning Objectives***

This course has the following objectives with respect to beginning software development using the Python programming language:

• Gain factual knowledge (terminology, classifications, methods, trends) about software development in Python with an emphasis on Data Science

• Learn fundamental principles, generalizations, or theories pertaining to software development in Python

• Learn to apply course material to software development in Python

***Free Online Textbook and Other Materials***

***"How to Think Like a Computer Scientist: Interactive Edition' -- ONLINE at:***<https://runestone.academy/runestone/static/thinkcspy/index.html>

There will be regular assigned readings and homework based on this interactive site. You do NOT need to register for an account on the site, since we won't be using these to manage course grades.

Additional outside material will also be covered, with related readings and code posted on our course Canvas site.

***Course Canvas Site***

We use Canvas, the standard Learning Management System (LMS) at UST. We will review its use in class. You can access our site via this URL: [https://canvas.stthomas.edu](https://stthomas.instructure.com/) Log on with your UST id and password.

Our course site's home page contains links to each class module, which in turn contains links to course assignments, in-class quizzes, and other resources. Students will submit all assignments via these links.All course documents will be posted on our course Canvas site. You can download them and print out your own paper copies if you wish.

Announcements are posted on Canvas throughout the course, which then automatically emails them to your UST account. Any last-minute class news such as cancellations are thus announced, so you should make sure you check your email and the course Canvas site regularly - and especially in the afternoon before each class.

Grades are tracked and calculated by Canvas, with your final course grade based on the weighted sum of all grade component scores. Components and weights for required coursework work are given below. You may check your current course grade on Canvas at any time.

***Grading***

There are seven (7) different components used to compute your final course grade, with the following weights:

*(20% of final course grade)* ***Reading Quizzes:***

Before the beginning of almost every class, you'll take 2-3 out of class **Reading Quizzes** (**RdQ** for short) on Canvas. These will be announced in the previous class, with each asking a single question. All questions are based on the assigned reading and related reading lecture videos. Most questions will be short answer or brief essay, with an emphasis on short Python coding questions. You must take all such assigned quizzes before the 5:45 PM start of the next class. If you miss the submission deadline for any such quiz, you will earn a 0 score.

*(10%)* ***Online******Review Quizzes:***

After the end of almost every class and before the beginning of the next class, you'll take a **Review Quiz** (**RvQ**) out of class on Canvas. It will have 4-6 problems of similar format and content to those found in any previous Reading or Review Quiz. You'll have a fixed time to complete each Review Quiz online, finishing before the 5:45 PM start of the next class. If you miss this deadline, you will earn a 0 score for the quiz.

*(10%)* ***In-Class Review Quizzes:***

Students will take two special **In-Class Review Quizzes (iRvQ)** **in class on paper** near the end of the course. Each iRvQ will have 10 short questions that are based on earlier Reading and Review Quiz questions, to be completed within 60 minutes. No computer or access to the internet is allowed for these, but you may bring in one single-sided sheet of paper with handwritten information. Sample quizzes will be provided for study.

*(10%)* ***In-Class Labs:***

There will be an assigned **Lab** (**L**) activity during each class, described in posted handouts. We will start these in class after a short discussion and review of the assigned Readings. Each Lab asks you to write and submit Python code. If you do not finish the assigned lab work in class, you may complete within a week without penalty.

You may work by yourself or with others on these Labs, but each student must submit their own work to Canvas for grading. Labs are not graded in detail. You'll receive full credit if you submit the requested work and I judge it to be "complete enough" - meaning you've demonstrated an honest effort to complete all work. Occasionally I may grade one or more problems in more detail.

You will lose points for submitting late Labs (that is, after the class following the one in which we started work on the Lab). If excessively late, Labs may not be accepted at all. If you miss a class, you'll need special permission to make up your missed Lab.

*(30%)* ***Homework Problem Sets:***

A **Homework Problem Set** (**H**) is assigned in almost every class, related to topics covered in that class and earlier.

Each set contains 3-5 problems, detailed in a handout posted within its assignment area on our Canvas site. Each problem typically asks you to write a Python script consisting of one or more **.py** files, with starting code often provided. When finished, you'll submit for grading each **.py** file separately, uploading it to our Canvas site via the assignment's submission tool.

Each problem set is due approximately one week after assigned, though difficult problems may have later due dates. Late submissions without a valid excuse will be accepted at the discretion of the professor and may incur some kind of penalty.

Unlike Labs, **you are expected to submit your own original work for each homework problem**; submissions similar to others will earn little or no credit, no matter who actually did the original work. Some problems will be graded in detail, with others graded in less detail.

*(15%)* ***Final******Course Project***

During the final weeks of the course, students will propose, implement, and present one or more Python scripts as part of the **Final Course Project**. You may work by yourself, or as part of a team of two on this project.

Your scripts may be original Python code, or else you may adapt and refactor another script or scripts.

One of your final project deliverables is a 10 to 15-minute desktop video presentation. In this video, you will demonstrate your code, discuss what it does and describe how you developed it. You will submit this video and its related Python scripts and test data as part of the deliverables for your project. I will upload each submitted video to a website, with a link posted to Canvas so others can view it.

Another project deliverable is an "elevator speech." In our final class meeting, each student or team will give a 2-3-minute high-level summary of their project in front of the rest of the class. It will be captured by the professor on video, with a link posted to Canvas next to that of your project desktop video.

This project acts as the final exam for our class; there is no separate final exam.

*(5%)* ***Class Attendance and Participation***

Students are expected to attend every class session. Students are also expected to participate in classroom discussion and activities.

If you must miss a class, email me (preferably beforehand), justifying your absence.

More than two unexcused absences will result in a loss of part of this final grade component.

***Final Grade Curve***

The curve for your final course grade is:

A >= 95%

A- 92-94%

B+ 89-91%

B 86-88%  
 B- 82-85%

C+ 79-81%

C 76-78%

C- 70-75%

D 60-69%

F < 60%

Incompletes are given to a student **ONLY** if he/she has completed a significant amount of the course work, **AND** if extreme circumstances prevent that student from normal completion of the course.

***Videos: Class, Readings and Tutorials***

Each class session is captured on video and made available to students. I do this using my own laptop, capturing video and audio of its projected screen. The resulting video files are converted to a compact format and uploaded to the Vimeo hosting site. Online links to these videos are then posted on Canvas for later student access and viewing.

Reading Lecture Videos are also posted before each class. Each discusses one or more sections of the assigned chapter readings, demonstrating and discussing the behavior of provided code examples within the book. These examples are run within the book's website, as well as within either the PyCharm IDE or a Jupyter Notebook.

Other videos will also be posted, including tutorials and other topics.

The details of how students in our class can access and view these videos will be provided. **Note that I (Eric V. Level) retain the copyright and ownership of all such posted videos and their content. Unauthorized viewing and/or distribution is strictly prohibited.**

***Recording of Classroom Activities***

All student recordings of class sessions using any device are expressly prohibited without the written permission of the instructor.

***Students with Disabilities***

Academic accommodations will be provided for qualified students with documented disabilities including but not limited to mental health diagnoses, learning disabilities, Attention Deficit Disorder, Autism, chronic medical conditions, visual, mobility, and hearing disabilities. Students are invited to contact the Disability Resources office about accommodations early in the semester. Appointments can be made by calling 651-962-6315 or in person in Murray Herrick, room 110. For further information, you can locate the Disability Resources office on the web at <http://www.stthomas.edu/enhancementprog/>.

***Syllabus Statement Related to Influenza*:**

The University of St. Thomas is committed to a healthy campus community. As in past years, there will be ongoing concerns regarding the prevalence among university faculty, staff and students of the influenza virus. To help limit the spread of these illnesses, the Center for Disease Control has provided college campuses the following recommendation: students, faculty, or staff with influenza like illnesses (temperature of 100.0 or greater, plus a cough or sore throat) are directed to **self-isolate** (or stay home) for at least 24 hours after their fever is gone without the use of fever-reducing medicine. In the event that students are unable to attend classes due to this self-isolation recommendation, they should email the professor. Faculty will provide opportunities for such students to participate in alternative educational delivery due to this illness.

***Academic Integrity***

Academic integrity is defined as not cheating and not plagiarizing; honesty and trust among students and between students and faculty are essential for a strong, functioning academic community. Consequently, students are expected to do their own work on all academic assignments, tests, projects and research/term papers. Academic dishonesty, whether cheating, plagiarism or some other form of dishonest conduct related to academic coursework and listed in the Student Policy Book under “Discipline: Rules of Conduct” will automatically result in failure for the work involved. But academic dishonesty could also result in failure for the course and, in the event of a second incident of academic dishonesty, suspension from the University.

Here are the common ways to violate the academic integrity code:

*Cheating* - Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise. The term academic exercise includes all forms of work submitted for credit.

*Fabrication* - Intentional and unauthorized falsification or invention of any information or citation in an academic exercise.

*Facilitating Academic Dishonesty* - Intentionally or knowingly helping or attempting to help another to violate a provision of the institutional code of academic integrity.

*Plagiarism* - The deliberate adoption or reproduction of ideas or words or statements of another person as one’s own without acknowledgment. You commit plagiarism whenever you use a source in any way without indicating that you have used it.

***Cheating***

In cases of cheating, the instructor will impose a minimum sanction of failure of work involved. The instructor will inform the student and the program director in writing of:

1. The nature of the offense,

2. The penalty imposed within the course;

3. The recommendation of the instructor as to whether further disciplinary action by the director is warranted.

If the instructor or the director of the program determines that further disciplinary action is warranted, a disciplinary hearing shall be commenced at the request of either the instructor or the director. (If there is a previous offense of this nature on the student’s record, a hearing is mandatory.)

Here are examples of various kinds of plagiarism. In each instance, the source is a passage from p. 102 of E.R. Dodd’s The Greek and the Irrational (Berkeley, 1971; reprinted: Boston: Beacon, 1957). First here is the original note, copied accurately from the book Functions, Dodds 12, p. 102:

“If the waking world has certain advantages of solidity and continuity its social opportunities are terribly restricted. In it we need as a rule, only the neighbors whereas the dream world offers the chance of intercourse, however fugitive, with our distant friends, our dead and gods. For normal men it is the sole experience in which they escape the offensive and incomprehensible bondage of time and space.”

Here are five ways of plagiarizing this source: (If you have any questions about plagiarism, ask the instructor.)

*1. Word-for-word continuous copying without quotation marks or mention of the author’s name.*

Dreams help us satisfy another important psychic need - our need to vary our social life. This need is regularly thwarted in our waking moments. If the waking world has certain advantages of solidity and continuity, its social opportunities are terribly restricted. In it we need, as a rule, only the neighbors, whereas the dream world offers the change of intercourse, however fugitive, with our distant friends, our dead, and our gods. We awaken from such encounters feeling refreshed, the dream having liberated us from the here and now...

*2. Copying many words and phrases without quotation marks or mention of the author’s name.*

Dreams help us satisfy another important psychic need - our need to vary our social life. In the waking world our social opportunities, for example, are terribly restricted. As a rule, we usually encounter only the neighbors. In the dream world, on the other hand, we have the chance of meeting our distant friends. For most of us it is the sole experience in which we escape the bondage of time and space....

*3. Copying an occasional key word or phrase without quotation marks or mention of the author’s name.*

Dreams help us satisfy another important psychic need - our need to vary our social life. During our waking hours our social opportunities are terribly restricted. We see only the people next door and our business associates. In contrast, whenever we dream, we can see our distant friends. Even though the encounter is brief, we awaken refreshed, having freed ourselves from the bondage of the here and now...

*4. Paraphrasing without mention of the author’s name.*

Dreams help us satisfy another important psychic need - our need to vary our social life. When awake, we are creatures of this time and this place. Those we meet are usually those we live near and work with. When dreaming, on the other hand, we can meet far-off friends. We awaken refreshed by our flight from the here and now.

*5. Taking the author’s idea without acknowledging the source.*

Dreams help us to satisfy another important psychic need - the need for a change. They liberate us from the here and now, taking us out of the world we normally live in....

If you quote anything at all, even a phrase, you must put quotation marks around it, or set it off from your text; if you summarize or paraphrase an author’s words, you must clearly indicate where the summary or paraphrase begins and ends; if you use an author’s idea, you must say that you are doing so. In every instance, you also must formally acknowledge the written source from which you took the material. (This includes material taken from the World Wide Web and other Internet sources.) Reprinted from “Writing: A College Handbook” by James A.W. Herrerman and John E. Lincoln. By Permission W.W. Norton & Co. Inc., Copyright 1982 by W.W. Norton & Co. Inc.

Students are encouraged to report incidents of academic dishonesty to course instructors.

When academic dishonesty occurs, the following procedures will be followed:

A. The instructor will impose a minimum sanction of failure for the work involved. The instructor will notify the student and the appropriate academic dean/director in writing of the nature of the offense and that the minimum sanction has been imposed. The instructor may recommend to the dean that further penalties should be imposed. If further penalties are imposed, the dean/director will notify the student immediately and the student will have five working days to respond to the intention to impose additional penalties. The student has the right to respond to the charge of academic dishonesty and may request in writing that the dean review the charge of academic dishonesty as fully as possible. If the dean/director determines that no further sanctions will be applied, the instructor's sanction will stand and the instructor's letter to the dean/director and student will be placed in the student’s file. If no further charges of academic dishonesty involving the student occur during the student’s tenure at St. Thomas, the materials will be removed from the file upon graduation.

B. If the student has been involved in a previous incident of academic dishonesty, the dean will convene a hearing, following guidelines listed under “Hearings and Procedures” in the Student Policy Book. During the hearing, all violations of academic integrity will be reviewed. The student and the faculty member charging the most recent incident will be present at the hearing.

C. In either situation, A or B, if the dean/director determines that further sanctions are warranted, the student will be informed in writing. Among the sanctions considered by the dean/director will be the following: failure for the course in which the incident occurred; suspension from the university for the following semester; expulsion from the university; community service; a written assignment in which the student explores the principles of honesty and trust; other appropriate action or sanctions listed under “Sanctions” in the Student Policy Book. The materials relating to the incident including the instructor’s original letter to the student and dean and the dean’s decision following the hearing, will become part of the student’s file.