University at Albany

INF 308 : Programming for Informatics Spring 2020

Tu/Th 11:45–1:05 DR 0014

Instructor	Cristyn Magnus, Ph.D.
Office Hours	TuTh 1:30–2:30pm or by appointment
Office	DR 146
Repository	`https://github.com/inf308/_courseInfo`
Reading	Severance, Charles R. *Python for Everybody: Exploring Data Using Python 3*, 2016. `https://www.py4e.com/book`

1 Course Description

Computer programming in an Informatics environment. The fundamentals of programming, including introduction to algorithms, object-oriented design, and data structures. Additional topics include basic interface design, security, networking, use of databases, and mobile and other non-traditional computing platforms.

Prerequisites: INF 100 and CSI105 or INF108

Grading: This course is A–E graded and the grades are determined based on the course activities and grading system defined below.

2 Learning Objectives/Outcomes

At the end of this course, you will be able to:

- Analyze real-world problems then design and implement computational solutions for them
- Use, know when to use, and understand code that uses the following data structures: lists, dictionaries, tuples
- Create, modify, and understand computer programs that use the following object oriented concepts: classes, objects, inheritance
- Use version control and project management tools
- Create a virtual environment and install external packages
- Create artificial life
- Use a video game engine
- Design and create a program that solves a problem you are interested in

3 Materials

You can find access to various resources at the University Libraries: `http://future.library.albany.edu/`

Readings Readings from the textbook (see above) will be listed in the achievement list, along with suggested completion dates. Additional readings may be added during the term.

Software & Online Materials

- Python 3 `https://www.python.org/downloads/`.
- (Recommended) Visual Studio Code `https://code.visualstudio.com/`. Python comes with the IDLE IDE, but it's not very powerful. We will use IDLE in class because it is on the school computers, but you will probably want to use something more powerful with integrated git version control if you have your own computer.
- Windows Users: git bash (`https://gitforwindows.org/`) or a gui git client
- Mac/Linux Users: git comes with your OS. Mac users may need to download something depending on their version. Type git in your terminal. If it's installed, you'll reach a help page. If it isn't, follow the instructions to install it. If you prefer, you may search for a gui git client instead.
- Piazza. Piazza is a wiki-based forum that allows students to ask and answer each others questions. Signup here: `piazza.com/albany/spring2020/inf308`. The course page is here: `piazza.com/albany/spring2020/inf308/home`. You will be required to post to piazza throughout the semester. Mobile apps are available for android and ios, but you'll find it easiest to use the web interface for posting questions, since you'll want to copy/paste code from your programs.
- Github. We will use github to submit all coursework. `https://github.com/inf308`

4 Assessment

4.1 Grading

Because New York state does not have K-12 computing standards, we're all starting this course at different places. Some high schools have great computer programs; some don't have any computing courses. Some of us have only had one computer course before this one; some of us have been dabbling with programming for years. Some of us are computing majors; some of us are not. Some of us grew up in houses with computers; some of us had to use computers at the library or get by with phones or tablets. And so on.

Everyone has to achieve the basic learning objectives for the course. Beyond that, there is a lot of open-endedness in this course so people can tailor it to their learning needs. To that end, I'm experimenting (I do that a lot) with gamified grading. Gamification is an

alternate way of evaluating that is is based on how scoring and experience works in games. Instead of having a fixed collection of activities that you get a grade on and that was your one shot, gamification lets you get experience in a variety of skills from a variety of places and level up various skills at your own pace.

Everyone will get a grade sheet that lists achievements they can achieve. Some of these achievements will be mandatory to achieve each grade level—you must get all the C achievements to receive a C in the course, all the B achievements to get a B in the course, and all the A achievements to get an A in the course. Each grade level also requires a certain number of optional achievements. Optional achievements are a bit like elective classes. A certain amount will be required to reach each grade level, but there are many more possibilities to choose from than you are required to complete. You can select from optional achievements to tailor the class to your background and interests. You will receive access to a spreadsheet that will let you track your progress in the course. The first sheet of this spreadsheet contains the elective requirements for each grade level.

An achievement might be the completion of something like using a specific programming technique, taking notes on a reading, or making enough git commits. Many of these you'll achieve along the way by successfully completing assigned work. (We keep the assignment structure of a traditional course, but there is no penalty for falling behind or skipping activities as long as you get achievements elsewhere.) Some achievements are from explicit optional activities, such as doing review exercises or writing a paper. Others achievements are less obvious. For example, you can get achievements for each new kind of bug you find and debug. There's no assignment to create a bug, but most people will have bugs crop up in their code along the way, and they can get an achievement for documenting the bug and how they fixed it.

Submitting Assignments & Claiming Achievements Unless otherwise specified, all assignments will be submitted through github. Don't worry if you haven't used git before; we will spend the first few activities familiarizing everyone with git so you'll be able to submit later activities. You should use your commit message to give an overview about the changes you made to your repository and note that you believe that you have achieved a achievement. If you add the course late and miss these in-class activities, it is your responsibility to familiarize yourself with git using online tutorials as fast as possible.

Claiming Achievements Because of the flexibility of the course, it isn't realistic to expect everything to be instantaneously graded. You are responsible for tracking your own achievements on the achievement sheet. There is a column on the achievement sheet labeled *self-check*. You should mark every achievement you believe you've achieved. This will allow you to track your progress through the course. The instructor will use the column

labeled *verified* to verify that you've done the activities you've marked off.

There are two kinds of things in the rows: achievements (these will be marked as A, B, C, or O to denote that they are either required for A, B, C grades or optional achievements) and practice. You should mark achievements with 1 in the self-check column if you believe you've completed the achievement. Practice rows (marked with P) are things you can get multiple achievements for as you practice them. For instance, each week has a row for the number of git commits you do that week. You should put down the number of commits you've done that week, for example, if you do 20 commits, put 20 in the self-check box. Skills represented in practice rows work like experience in a video game. As you gain experience through practice, your level will go up. Levels will be translated into achievements.

The grade tab of the achievement sheet will calculate your progress towards various achievements. As long as you maintain your self-checks, you'll know how you're doing in the course.

Do NOT hand in assignments through email Emailed assignments will not be considered submitted. If you choose to hand in an assignment by email for any reason, even with written or verbal permission from an instructor, you must also follow up with a submission via github as soon as possible. Email can get lost; your github repository will collect everything in one place and clearly document what you have accomplished in the course.

4.2 Graded Activities

Participation We will maintain our own forum on `http://piazza.com` where students from the course can post questions and answers. Piazza allows wiki-like collaborative construction of questions and answers. You can progress towards milestones for posting questions, answering questions, editing questions, and keeping up with reading other people's posts.

To receive credit, you must register for piazza with the name you are registered with as a student or a preferred name that you regularly use and have shared with the instructor.

Class Activities Although class attendance isn't specifically required, many in-class activities will be required achievements. For example, we will spend the first class learning git, which will get you the following achievements that are required to pass the class: clone

a repository, make first edit to your individual repository, stage a change to your individual repository, first commit to your individual repository, and first push to your individual repository. You will need to do these achievements without the in-person support of your instructor and class mates if you miss doing them in class.

Additionally, you can get an achievement for each class you attend in which you commit a short reflection on what you learned that day. Since some elective achievements are much more difficult to achieve, attending class and completing a reflection is low hanging fruit that you may regret giving up if you don't do them when you have the chance.

Reading There are pdfs of the textbook and several enrichment readings in your individual repository. Additionally, there are links to some online articles in your achievement sheet.

You can read them however you like, but you won't receive achievements for *just* reading. To receive reading achievements, you must take notes and commit them to your github repository. You may use a pdf reader to annotate pdfs or you may use a .txt or .md file for taking notes on the reading.

Programming Programming projects of increasing complexity will be assigned over the course of the semester. You will do these programs in your git repository. You should plan towards making significant progress towards a programming project each week.

Sustainable Working Many students develop problematic time management habits in school. In particular, some students fall into the trap of working in a way that resembles a sinusoid: taking the first few weeks of the semester easy because everything assigned looks comfortably far in the future, followed by high intensity work to meet deadlines, followed by burnout, recovery time, and falling behind, followed by another high intensity work period to try to get back on top of deadlines.

These habits are very unhealthy and become even more problematic when you finish school and enter the workplace when deadlines are far enough in the future and the projects are big enough that they can't be completed if they aren't started until the deadline approaches. It should be everyone's goal to flatten out that sinusoidal pattern of high intensity work followed by burnout and recovery so that it becomes a manageable amount of consistent, sustainable work.

Some of your achievements will come from working a bit every week to encourage you to start things before they become unmanageable. As with attendance, these achievements

are low hanging fruit. You will have to do the work anyway; you are better off getting the optional achievements for doing work on a weekly basis instead of putting it off until the last minute and having to do even more work to meet your optional achievement requirements.

Final Project *There is no final exam.* Instead of a final exam, you will do a final project. You should treat this with the same gravity that you would treat a final exam.

You should spend time throughout the beginning of the term thinking about your final project. You may submit a final project proposal at any time (in your individual repository on github) and can begin working on the project as soon as it is approved. You should plan on working on it in pieces over the course of the last part of the semester. You probably want to wait until you've learned enough to work on it, but don't wait so long that you are rushed and don't have time to seek help if you need it.

Your final project will consist of a program and a poster presentation at the UAlbany Showcase on April 28. Presenting at the showcase is preferred, as it is before your final deadline and feedback you receive might help you improve your project before the deadline. The paper option is intended for students whose schedules do not permit them to attend the showcase. Students choosing the paper should make a point of attending office hours for feedback.

5 Policies

Attendance: Attendance, itself, is not graded. Instead, in-class activities allow opportunities for achievements. All required achievements can be made up elsewhere, but if you miss class you will lose the opportunity to work on them in a setting where the instructor and your classmates are available if you need help. Additionally, some in-class optional achievements cannot be made up outside of class. If you miss too many optional achievements, you may have difficulty getting enough optional achievements to reach the grade level you desire.

Time Management Each credit hour at UAlbany translates into roughly 3 hours of work[1]. That means 1 hour of class and 2 hours outside of class. This is a three credit class, meaning 3 hours of class and 6 hours of work outside of class, for a total of 9 hours. If you miss class, you should plan to make up the time you missed with extra work outside

[1] `https://www.albany.edu/registrar/registrar_assets/Guidance_on_Credit_Hours.pdf`

of class. If you find that you work more slowly than the typical student, you may find that you need to set aside more than 6 hours outside of class to achieve the grade you desire.

Computing Resources: Although the projects can be done on your own computers, problems with your system (hardware, software, network access, etc.) will not be accepted as excuses for late or missing work. Information Commons computers are provided in the UAlbany libraries for students with computer or network issues. Students are required to read the University at Albany Policy for the Responsible Use of Information Technology (`https://wiki.albany.edu/display/public/askit/Responsible+Use+of+Information+Technology+Policy`).

Email/Communication Policy: Unfortunately, the university sends so much spam to my albany.edu email account that I cannot keep up with student emails in a timely fashion. If you email me, there is a decent chance that it will be lost between the deluge of spam. Instead, you should use piazza for all course-related communication.

If you have a non-personal question about the course that might be of interest to other students, you should post the question publicly. You can choose to post publicly with your name or to make the post anonymous to other students, so they see the content of your post but not who posted it. If you ask a non-personal question and send it just to the instructor and hide it from other students, the instructor reserves the right to make it public so other students can benefit from the answer. The instructor can't change your name visibility setting, so a private post that isn't anonymized may have your name attached if it is made public. Non-personal questions are questions about the course in general, technical problems, questions about particular activities, etc. Non-personal questions also include programming problems, even problems with your final project, since other people may experience the same bug in a different context and still benefit from your response.

If you have a personal question about the course, you should post the question privately to just the instructor. Private posts will never be made public to anyone else. You should post privately if you have issues such as making arrangements for disability accommodations, personal matters that are impacting your work such as physical or mental illness, death in the family, etc.

Make-up Policy: There are generally no make-up opportunities for missed assignments except in extenuating circumstances (please see `http://www.albany.edu/health_center/medicalexcuse.shtml`.). Instead of asking to make up missed work, please use other optional achievements to make up for optional achievements that you miss.

If you miss a class in which a required achievement is covered, you can do that achievement

on your own and still get credit from it, but you should plan to come to office hours or post to piazza if you find you can't figure out how to do it quickly on your own.

If you become seriously ill during the semester, or become derailed by unforeseeable life problems, and have to miss so many achievements that it will ruin your grade, meet with your instructor in order to make arrangements. Don't wait until it's too late to see us when you get in trouble.

Students with Disabilities: Reasonable accommodations will be provided for students with documented physical, sensory, systemic, cognitive, learning, and psychiatric disabilities. If you believe you have a disability requiring accommodation in this class, please notify the Director of the Disability Resource Center (`http://www.albany.edu/disability/`). That office will provide the course instructor with verification of your disability, and will recommend appropriate accommodations.

In general, it is the student's responsibility to contact the professors at least one week before the relevant assignment to make arrangements. If you have a disability that affects you sporadically, it is a good idea to preemptively register with the disability office so that if you have a flare up, you will have already set up your safety net.

Incompletes and Requests for Re-evaluation: Students must complete all requirements in order to pass the course. A grade of incomplete will be given only when circumstances beyond the student's control cause a substantial amount of course work to be unfinished by the end of the semester. Whenever possible, the student is expected to make extra efforts to prevent this situation from occurring. The instructor will be the sole judge of whether an incomplete is warranted. Final grades are computed based on the above formulas and are NOT negotiable. Per department policy, "students may not submit additional work or be re-examined for the purpose of improving their grades once the course has been completed and final grades assigned."

A student granted an incomplete will make an agreement specifying what material must be made up, and a date for its completion. The incomplete will be converted to a normal grade on the agreed upon completion date based upon whatever material is submitted by that time.

Withdrawal from the course: The drop date for the Spring 2020semester is Mon, Sep 9 for undergraduate students. That is the last date you can drop the course without receiving a 'W.' The last day you can drop the course and receive a 'W' is Mon, Nov 4. It is your responsibility to take action by this date if you wish to drop the course. In particular, grades

of "incomplete" will not be awarded to students because they missed the drop deadline.

Announcements: Course announcements will be posted on Piazza (`http://piazza.com`. You are expected to be aware of course announcements. You can set the app to give you push notifications when new questions, answers, or announcements are posted. You may also use settings to configure it to send you email (or not), either in real-time or as a digest.

Weather Cancellations: Students are responsible for awareness of campus closure. You can get this information from various sources. See `http://www.albany.edu/emergency/` for more information.

Unless an announcement is posted saying otherwise, weather cancellations will not affect the planned schedule.

Phones, Laptops, and Other Distractions: Students are required to read the University at Albany Policy for the Responsible Use of Information Technology available at the ITS web site: `https://wiki.albany.edu/display/public/askit/Responsible+Use+of+Information+Technology+Policy`

Computers, phones, and laptops may be used during class for note taking as long as the use is not disruptive or distracting. If you have attentional issues that prevent you from focusing on class if you are not also fidgeting with something else, you should make a point of sitting towards the back or edge of the room so you don't hurt the focus of students whose attention requires minimal distraction. While the instructor may be lenient in students taking the occasional emergency text, you may be asked to put your tech away or sit in the back if your tech use becomes a significant distraction to other students or is hindering your ability to focus on the class.

Conduct: Students are expected to abide by UAlbany community standards: `http://www.albany.edu/communitystandards/`. In particular, students are expected to be civil in class and in the piazza forum associated with this class. Trolling, hate speech, harassment, etc. will bear the same penalties as academic dishonesty (see below).

6 Academic Integrity

Students are expected to be familiar with and abide by UAlbany's Standards of Academic Integrity published in the Undergraduate Bulletin. (`http://www.albany.edu/undergraduate_bulletin/regulations.html`)

Some of the work that you do in this class will be done with teams and some will be individual. Academic honesty principles apply in both cases: teamwork must be the work of the team and no one else; Individual work must be the work of the individual and no one else. In particular, in-class activities that you do alone with your team as a study group must be your own work. Your team is there if you need conceptual help or feedback, but input beyond that constitutes cheating.

You may form study groups, discuss assignments and techniques in general terms, etc., but the assignments themselves must be your own work. In particular, two or more people may not create any portion of an assignment together and submit it for credit. Please ask if you have any questions about academic integrity.

A (non-exhaustive) list of unacceptable activities is:

- Allowing other students to see or copy your assignments.
- Examining or copying another student's assignments.
- Allowing other students to see or copy your work during an exam.
- Examining or copying another student's work during an exam.
- Getting answers or help from people, or other sources (e.g. research papers, web sites) without acknowledging them.
- Directly using ideas from other sources without engaging with those ideas and producing something of your own. Rewording someone else's ideas is still plagiarism unless you are restating their ideas as a first step to engaging with those ideas.
- Lying to the professor about issues of academic integrity.

Any incident of academic dishonesty in this course, no matter how "minor" will result in:

- No credit for the affected assignment.
- A written report will be sent to the appropriate University authorities (e.g. the Dean of Undergraduate Studies).
- One of
  - A final mark reduction by at least one-half letter grade
  - A Failing mark (E) in the course
  - referral of the matter to the University Judicial System for disposition.