

ESS245 Computational Geology - Syllabus

Version: July 19th, 2022

Instructor: Ulrich G. Wortmann (uli.wortmann@utoronto.ca).

e-mail policy: All course content-related questions must be asked through the Quercus discussion board. E-mail will only be answered for personal matters (i.e., illness, complaints (hopefully not), etc.)

TA: Tianshi Liu (tianshi.liu@mail.utoronto.ca)

Class Times

Lectures:

- Mondays 9:10 AM to noon
- Wednesdays 9:10 AM to 11 AM

Delivery Mode: Online, synchronous. Most classes will start with a short introduction of about 30 minutes (online, synchronous). The rest of the class time will be used to work on practical assignments. Support for assignments will be exclusively through the Piazza Discussion board. One-on-one zoom sessions (aka office hours) to discuss course-related issues which do not belong on a discussion board will be made available upon request.

You are welcome to leave classes early (I.e. to accommodate other courses), but please join on time, as the most important information will be conveyed in the first 30 minutes. Classes start at 9:10 sharp.

First Meeting: Monday, September 12th, 9.10 AM. I will post the video link as an announcement on the course homepage.

Course Structure: For this course, you will have to submit two assignments per week. The instructor will be guiding you through each of these assignments during class time, and you then have 36 hours to submit your finished assignment. Students will need access to a laptop or PC to participate in this course. Furthermore, much of the learning will happen with and through the course discussion board (see the marking scheme).

About this course

This course will introduce you to the basic principles of programming with python. In the second half of the course, we will use actual data to explore everyday tasks, e.g., generating basic statistical data, cleaning up data, or producing simple graphical figures.

Note that coding is a practical skill that can only be learned by doing it. Therefore, this course is being taught as an inverse classroom, i.e., most of the class time you will work on practical assignments. Additional assignments will be given as homework.

You should expect to spend considerable time trying to figure out why your code produces error messages, or why it produces unexpected results. This is the hard part, and where most of the learning occurs.

This course relies heavily on your willingness to ask and answer questions. See the "Survival Guide" and "Plagiarism" sections to get an idea of how the course is being taught.

Expectations

- You don't know much about computers, but you are curious about computing (this is important!)
- You are independent and willing to work out problems on your own and in a group
- You have access to a laptop/PC and an internet connection

Learning Outcomes

- Working with Jupyter Notebooks
- Basic python coding skills
- Understanding error messages
- Where to find help
- How to ask for help
- How not to give up

- Working with popular python libraries like pandas, or matplotlib
- Manipulating actual data

Recommended Reading

There are a couple of python textbooks and plenty of online python tutorials. However, these are often geared toward a different audience, and/or refer to python 2. In this course, we will use python 3.7 and it is recommended to use the ESS245H1 Computational Geology lecture book. We will follow the latter one to the dot, and you can download it from Quercus.

Marking Scheme

Type	%	Due Date
Discussion board participation	10	cont.
Assignments 1 (see the note below)	45	cont
Assignments 2 (see the note below)	45	cont

To pass the course you must submit at least 70% of all assignments with a grade better than 49%.

Communications Policy

- You are welcome to send me an e-mail to alert me about an absence etc., however, questions about the course material/assignments etc. will only be answered on the discussion board.
- This term we will be using Piazza for class discussion. The system is highly catered to getting you fast and efficient help from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, all assignment-related questions must be asked on Piazza. I will post further details (i.e., how to sign up etc) on Quercus.

Survival Guide

Coding may appear alien and strange at the beginning. So this course will start very simple. Do not let this become a trap, because you think you know the basics already. If you know some stuff, more power to you, do

the assignments in record time, and then help your classmates if you feel charitable. But do not assume that things will stay simple, or that it is enough to think you understand what is going on. Instead, coding is a practical skill, where each step depends on the skills learned in the previous step (we will not loop back to revisit past materials!). This is why most of the course time is used to practice your skills and provide a forum to ask questions.

Based on the above, you can probably already make a prediction that consistent participation will be critical to your success. Let's compare this prediction against actual data from a previous year (see Fig. 1).

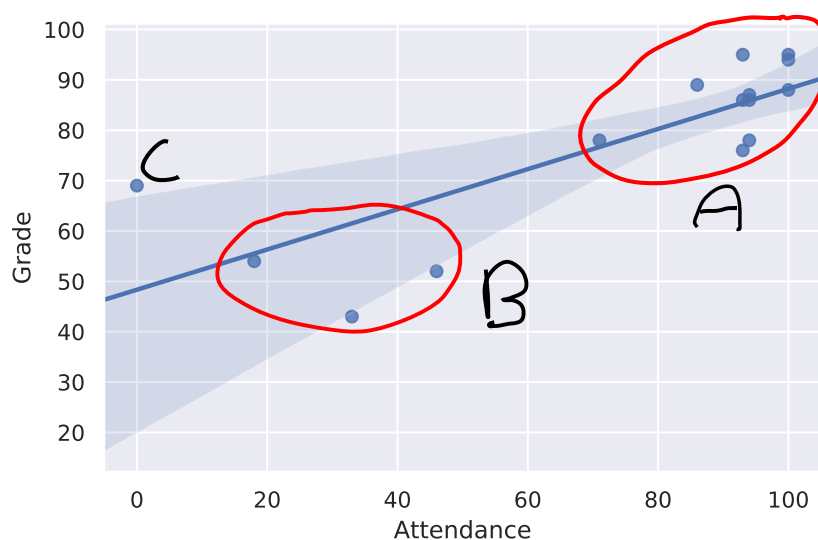


Figure 1: Attendance versus Grade in last year's class

Students in Group A & B were of similar ability, whereas the sole student in C, was the strongest in class and had previous coding experience. So here are my recommendations on how to succeed in this course:

- Have a printed copy of the textbook at hand when you work on your assignments.
- Use the textbook to your advantage (it has a rather useful index).
- Do not skip assignments

- If you are a weak student, ask questions (a lot of learning happens when you have to explain your problem)
- If you are a strong student, help your fellow students understand (a lot of learning happens when you have to explain)
- Participate in and initiate discussion board conversations
- Do not be shy (Rule #1: There are no stupid questions. Rule #2: If you think your question is too dumb, I can guarantee that at least 50% of the class has the same problem).
- Cheating won't pay. It may save you an assignment or two, but you will lose the necessary skills, which will only make it harder for future assignments. You will learn more by honorable failure, than by fraudulent success.
- If you struggle with a particular issue for more than 10 minutes, apply rule #1 and #2, and then ask Piazza for help.

Course Outline

Please see the textbook link on Quercus

Submission of Assignments/Missed Assignment policy

Unless agreed to otherwise, assignments are to be submitted via Quercus in notebook and pdf format. The deciding date is the timestamp when Quercus receives the assignment. This course has a zero lateness policy. I.e., even if you miss the deadline by a minute, your assignment will default to zero.

If you require a deadline extension, you must request this in writing via e-mail to the course instructor **24hrs before** the submission deadline. Note that extension requests longer than five business days must be made through your registrar.

If you have a medical condition that prevents you from working on (and submitting) your assignment, you must apply for consideration within five business days of the missed assignment using the Request for Exemption Form. If your petition is approved, you will be pro-rated on the missed assignment/test (i.e., be given a mark that is equal to your average course mark). However, to pass the course, you need to submit at least 70% of all assignments with a grade better than 49%.

Plagiarism & Copyright

Surprisingly, these are two different things. Copyright infringements are a criminal offense and include things like illegal duplication or sharing of copyrighted material. Towards this end, please be aware that the textbook is copyrighted and only meant for your personal use. Please do not upload it (or any of the assignments) elsewhere.

Plagiarism is an academic offense and relates to sharing/using of thoughts and ideas without attribution. As stated before, this course is all about asking and explaining. As such, group work during class times is encouraged. That being said, all submissions must be your own. Specifically

- You cannot share the actual code with your team members.
- You can share links to code examples found on the web, explanations documentation, or ideas.
- All sharing of links etc. must proceed through the discussion board.

Plagiarism is not allowed and will be dealt with according to the UofT guidelines. As smart students, I expect that you are well versed in the pitfalls of correctly attributing the ideas of others. If you are unsure, please come and ask how to deal with a specific situation before submitting your assignment. The course discussion board is an excellent forum to do so. Please familiarize yourself with the Academic Integrity Resources provided by UofT: <http://www.artsci.utoronto.ca/osai/students> (lots of useful info, including information on what to do when you committed an offense. <https://guides.library.utoronto.ca/plagiarism> (excellent advice on how to prevent mishaps when using the works of others).

Privacy and Copyright considerations

1. This course, including your participation and chat window contributions may be recorded on video and may be available to students in the course for viewing remotely and after each session. If you feel uncomfortable with the idea that you are part of such a recording, please speak to your instructor well ahead of time.
2. All course materials (including but not limited to, emails, pdfs, notebooks, images, and videos) belong to the instructor, the University,

and/or other sources depending on the specific facts of each situation, and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor. Doing so, violate the instructor's intellectual property rights and the Canadian Copyright Act. Students violating this agreement will be subject to disciplinary actions under the Code of Student Conduct.

3. Students may not create audio recordings of classes except those students requiring accommodation for a disability, who should speak to the instructor before beginning to record lectures. Students creating an unauthorized audio recording of lectures violate an instructor's intellectual property rights and the Canadian Copyright Act. Students violating this agreement will be subject to disciplinary actions under the Code of Student Conduct.
4. Course videos may not be reproduced or posted or shared anywhere other than the official course Quercus site and should only be used by students currently registered in the course. Recordings may be saved to students' laptops for personal use.

Useful Links

- Calendar
- Degree Explorer
- Missed tests and assignments
- Student Life
- Sexual Harassment Office 40 Sussex Ave., 3rd floor, Tel. 416 978-3908
- Exchange Programs (Study Elsewhere)
- Personal Counselling, Learning Resources and Stress Management, Assault counseling, support with Disabilities, etc.
- Academic Appeals Information
- Academic Integrity
- Family Care Office

- Help with Learning English and Other Services for International Students
- Help with writing skills
- Housing Service
- First Nations House
- Sexual & Gender Diversity Office
- APGO
- UofT Convocation