

University of Toronto-Scarborough
Department of Physical and Environmental Sciences
EESB19H3 Mineralogy - Winter 2019-2020

Instructor: David Summer, ES 4095, email: david.summer@mail.utoronto.ca
Office hours: Monday, 12 pm – 1pm, and by appointment

Teaching Assistant: Adriano Roberto, email: adriano.roberto@mail.utoronto.ca
Lectures: Monday, 1 pm – 3 pm (virtual; if in person, room IC 120)
Labs: Monday: 3 pm – 5 pm (virtual; if in person, room EV224, EV222)

Overview:

In this course you will learn about minerals, the smallest and most basic building blocks of our planet. These minerals, which can vary in specimen size from microscopic to a macroscopic scale of meters, form aggregates (rocks), fill cavities and caves, form natural resources (e.g. gold, iron-minerals, rock salt), and are often used in our daily life, for example in form of specifically developed concrete mixtures, without being recognized as such. This course will help you to better understand mineral growth, their distinct structure and chemical composition, how they associate with one another, how minerals aggregate to form rocks and what applications minerals are used for.

We will start with an introduction to the study of crystallography, as it is an important tool of Earth and material sciences. This will include the delineation of specific crystal symmetries and morphologies, as well as basic classification of minerals by crystal classes. Furthermore, we will study the mineralogy, including physical and chemical properties, of the most important mineral groups, in which mineral assemblages they occur in form of rocks, and how these are used in our daily life.

Furthermore, we will practice 3D visualization and spatial skills needed in all geology-related disciplines in form of in-class exercises and laboratory exercises.

Communication:

Please use your **UofT e-mail address** for all communications.

Lecture & lab material will be posted on **Quercus**. Quizzes and all lab and exam submissions will be through Quercus. Course announcements will also be posted on Quercus. Please check daily for updates.

Online lectures and labs will be held on the Zoom platform. Please use the [UofT Zoom portal](#) to join all online lectures and lab sessions. The details to join Zoom sessions will be provided on the course Quercus page. Should lectures and labs return to in-person sessions, the details of the transition will be announced as soon as possible.

Should in-person activities resume, please refer to the [Covid-19 Information for UofT Students](#) webpage for the most up-to-date information and resources regarding Covid-19 mitigation policies.

A [Discord Server](#) is set up for this course. Please post any questions relating to the labs, lectures, and exams on Discord. Discord will be monitored regularly. In order to benefit everyone in the course, any questions pertaining to course material that is emailed to myself or to the TA will be posted on the Discord server with a response, with the student asking the question remaining anonymous.

Lab-related questions can also be directed to the TA for that lab (including questions about marking). For all other questions (including missed labs or extension requests), please contact the instructor via Quercus or email (include “EESB19” in the subject line). Allow up to a 24 hour response time, on any mode of communication.

Readings:

Earth Materials – Introduction to Mineralogy and Petrology, C. Klein & A. Philpotts, 2013, Cambridge Univ. Press (course reserve)

The Manual of Mineral Science, 23rd Edition, John Wiley & Sons Inc.

Complimentary reading: Introduction to Mineralogy, W. D. Nesse, any edition (course reserve)
A dictionary of earth sciences (course reserve)

Lecture & Lab Schedule - Subject to change – Please check Quercus for updated version:

Week	Lecture	Date	Lectures	Labs	Exams and Exercises
1	1	Jan. 10	Lecture 1: Introduction & Mineral Chemistry	No Lab	
2	2	Jan. 17	Lecture 2: Crystallography	Lab 1: Mineral Chemistry	E1: Jan. 17-19
3	3	Jan. 24	Lecture 3: Crystallography	Lab 2: Crystallography	E2: Jan. 24-26
4	4	Jan. 31	Lecture 4: Mineral Properties Overview; Microscope and Hand Samples	Lab 3: Intro to Microscopy & in Hand Sample	E3: Jan. 31-Feb. 2
5	5	Feb. 7	Lecture 5: Mineral Classifications; Native Elements and Sulphides	Lab 4: Native Elements & Sulphides	Term Test One due date: Feb. 10
6	6	Feb. 14	Lecture 6: Halides, Carbonates & Sulphates	Lab 5: Halides, Carbonates & Sulphates	E4: Feb. 14-16
		Feb 21	Reading Week	Reading Week	
7	7	Feb. 28	Lect. 6: Crystal Growth; Oxides and Hydroxides	Lab 6: Oxides and Hydroxides	E5: Feb. 28-Mar. 2
8	8	March 7	Lect. 7: Nesosilicates & Inosilicates	Lab 7: Olivine, Pyroxenes and Amphiboles	E6: Mar. 7-9
9	9	March 14	Lect. 8: Tectosilicates	Lab 8: Quartz, Feldspars & Feldspathoids	E7: Mar. 14-16
10	10	March 21	Lect. 9: Cyclosilicates & Phyllosilicates	Lab 9: Mica, Beryl, Tourmaline, Apatite and Topaz	Term Test Two due date: Mar. 24th
11	11	March 28	lect. 10: Sorosilicates	Lab 10: Metamorphic Silicates	E8: Mar. 28-30
12	12	April 4	Lecture 11: Phyllosilicates 2	Lab 11: Sheet Silicates	Term Test Three due date: April 7

Marking Scheme:

11 Lab Assignments (each 4%)	44%
8 Lecture Exercises/Quizzes (each 0.5%; best of 9)	4%
Mineral Presentation (Individual)	2%
Term Test One (take-home exam)	20%
Term Test Two (take-home exam)	20%
<u>Term Test Three (take-home exam)</u>	<u>10%</u>
Total	100%

Lectures:

Students are expected to attend all lectures. It is the responsibility of the student to ensure that notes are obtained for any classes missed. Lecture slides will be posted on Quercus on the evening before the lecture.

Lab exercises (4% each – 44%):

Labs are mandatory for all students and the respective assignments are graded. During laboratories/tutorials you will have a chance to work more independently in order to strengthen your knowledge; during the lectures you'll receive more guidance throughout the material. The knowledge acquired during the laboratory exercises can also be tested in the midterm test and in the final exam.

Required lab materials:

- 10x geological hand lens
- Pens/pencils, eraser, pencil crayons, ruler, protractor, calculator, scissors,
- A laptop or tablet
- Scanner or camera is also required to scan/photograph lab components that are completed by hand (e.g., sample drawings) to be included in the lab report.
- Lab coat and goggles for in-person sessions (EV224-222 are official laboratories and therefore wearing a lab coat and goggles is mandatory!)

Ensure you have the necessary equipment prior to the first lab as this will not be a valid excuse for late/missing work.

Mineral Spreadsheet:

Part of the course work is to create a mineral spreadsheet in which all the relevant mineral properties are compiled for use in this course and further studies. We will start filling in the spreadsheet in lab 4 and it will be updated and handed in with each subsequent lab assignment. Failure to submit the spreadsheet with the lab will result in a -10% penalty in the lab grade. Please use lecture material, <http://webmineral.com>, mineralogy textbooks, or other reliable sources of mineral information.

Lecture Exercises/Quizzes (0.5% each - 4%):

Lecture exercises/quizzes will be announced during nine lecture periods, as per the course schedule. The specifics of the lecture exercises will vary each. If quizzes are assigned, they will not be timed and will be available for 2 days after the lecture. Each exercise/quiz is worth 0.5%.

Mineral Presentation (2%):

Each student will give a 3–5-minute (maximum 3 ppt slides) presentation on a mineral or mineral group. A sign up sheet will be made available on Quercus, and students will have the opportunity to select a mineral on a first-come-first-served basis. Selections must be made by January 24th. The presentations should contain chemical composition, structure, crystal system, the most important physical and optical properties, geological occurrence, history, uses of the minerals, as well as sources of information and lots of images. The ppt of the presentation is to be handed in on or before the day when it is due, which will be within lecture hours. The schedule of presentations will follow that of the course schedule, therefore, changing the dates of presentations will not be allowed.

Term Tests One, Two and Three (20%, 20% and 10%, respectively):

Take-home term tests will be made available on Quercus following the lab period as per the course schedule above. The exams may include multiple-choice, true-or-false, fill-in-the-blank, definitions, short or long answer. Term Tests Two and Three will be

cumulative but will be heavily weighted towards material covered following the previous Term Test. Figures, movies, and animations are examinable, as are in-class participation/lab type exercises. The exam will be available on Quercus for a 72 hour period. Multiple choice and true-or-false questions will be through Quercus and will have time limitations. **Note: Written answers for exams must be limited to the space provided. Written answers extending beyond the space provided will not be graded. Short and long answer portions of the exam must be submitted in a DOC or PDF format. Exams will be filtered through a plagiarism detection program, Ouriginal. Hand-written answers will not be accepted and will receive a grade of zero. Late Submissions will not be accepted.**

Additional information about the exam will be provided ahead of time (including exact deadline, what resources may be used, how these resources must be cited, and what kind of consultation/collaboration with other students is permitted). Note that although this exam is open-book (i.e., you will have access to the material that you will be tested on), these exams will still require studying and preparation. I recommend reviewing this guide: <https://studentlife.utoronto.ca/wp-content/uploads/Take-home-and-Online-Exams.pdf>. Additional strategies for preparing for and writing tests can be found on the [Exam Tips](#) handout available on the [academic success website](#). If you are registered with Accessibility Services and have questions/concerns regarding your accommodations, you are encouraged to contact your Accessibility advisor.

Grades:

For explanation of grades, see the [Grading Regulations](#) section in the Calendar. All grades published online via Quercus during the term are given without any guarantee to be accurate; up-to-date records are on file with your instructor.

Study Questions:

A set of study questions will be posted for each course topic, which should help you to identify the important course information, study for the quizzes and exams, and to keep on top of the material.

Assignment and Exam Submission Method:

All lab assignments and exams are to be submitted online via Quercus. It is your responsibility to ensure that all scanned work is legible (i.e., in focus) and to carefully check Quercus to ensure that your work has been successfully submitted. **Illegible material will be assigned a grade of zero.** Each course component will have an upload link made available once the assignment/exam is issued. Please note the specific deadlines for each assignment/exam. The upload link for lab assignments will be available for one week after the deadline, during which time late penalties will apply (see "Missed Academic Work" below). Links for exam uploads will close at the exact due date and time and late submissions will not be accepted. **Do not email completed assignments** to the instructor or TA, only assignments submitted via Quercus will be accepted.

Note regarding exams: Written answers for exams must be limited to the space provided. Written answers extending beyond the space provided will not be graded. Short and long answer portions of the exam must be submitted in a DOC or PDF format. Exams will be filtered through a plagiarism detection program, Ouriginal. Hand-written answers will not be accepted and will receive a grade of zero.

Ouriginal:

Students will be required to submit their coursework (including take-home exams) to Ouriginal.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their written work to be included as source documents in the Ouriginal.com reference database, where they will be used solely for the purpose of detecting plagiarism.

Missed Academic Work:

Please note that all deadlines are for the **submission** of your work on Quercus, not just the completion of your work. It is recommended that you submit your work well in advance of the deadline in case you run into technical difficulties. Please note there are **no makeups** for unexcused missed labs, in-class exercises, quizzes or exams. **Exams that are submitted late will not be**

accepted. If you know that you will miss an assignment deadline then please let me know in advance, as we might be able to work something out. Should you miss a deadline for any term work, other than the midterm and final exams, you will be automatically penalized **5% per day (including weekends)**.

Missed labs or other deadlines will only be excused for cases in which the absence was entirely beyond the student's control (e.g., medical reasons, personal affliction). **To request an exemption for a missed lab or deadline, you must register your petition by [clicking on this link](#).** We reserve the right to request supporting documentation such as a doctor's note. All requests for consideration must be received no later than 5 business days after the exam/assignment (the University is open during Reading Week). If your petition is accepted you will be pro-rated on the missed assignment/test (i.e., you will be given a mark which is equal to your average course mark). Note, that reasons involving personal commitments, such as vacation travel arrangements, are not considered legitimate grounds for missing deadlines and that we reserve to the right request further documentation (e.g., a doctor's note etc.). If your petition is successful, you (and your instructor) will be informed by e-mail.

Re-marking Assignments and Term Tests:

For an individual item of work that you believe is incorrectly or unfairly marked, you may submit a written request (e.g., email) to the TA who marked it for re-evaluation. Requests should be made as soon as reasonably possible after the work is returned, but **no later than two weeks after it was returned.** If you are not satisfied with this re-evaluation, you may appeal to the instructor in writing. If a re-marking is granted by the instructor, the student must accept the resulting mark as the new mark, whether it goes up or down or remains the same.

Academic Integrity Statement:

Academic integrity is one of the cornerstones of the University of Toronto. It is critically and important both to maintain our community which honours the values of honesty, trust, respect, fairness and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently. According to Section B of the University of Toronto's Code of Behaviour on Academic Matters which all students are expected to know and respect, it is an offence for students:

- To use someone else's **ideas or words** in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, i.e. to commit plagiarism.
- To include false, misleading or concocted **citations** in their work.
- To obtain **unauthorized assistance** on any assignment.
- To provide **unauthorized assistance** to another student. This includes showing another student completed work.
- To submit their own work for credit in **more than one course** without the permission of the instructor.
- To falsify or alter any **documentation** required by the University. This includes, but is not limited to, doctor's notes.
- To use or possess an **unauthorized aid** in any test or exam.

There are other offences covered under the Code, but these are by far the most common. Please respect these rules and the values which they protect. It is your responsibility to ensure that your work maintains academic integrity. If you have any concerns please see the instructor before a potential problem arises. Please familiarize yourself with the Code (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) and also with the handout "How not to plagiarize", available in the Course Documents section on BB. At the University of Toronto academic dishonesty can result in a *mark of zero, a reduction in final grades, denial of privileges, a monetary fine, failure in the course, suspension, permanent record, a recalling of degrees/diplomas and certificates, or expulsion.*

Library Service:

Research Help: University of Toronto Scarborough Library

Staff at the UTSC Library will be happy to help you find the resources you need for your assignments, and learn the research skills you will need for success at university.

Research help is available by phone, e-mail, chat, or in-person in the Library.

For more information, please see the Library's Help Guide for UTSC Students: http://guides.library.utoronto.ca/utsc_help

Need in-depth or department specific assistance? Contact Sarah Forbes, Liaison Librarian for Physical and Environmental Sciences: <http://uoft.me/smforbes>

Accessibility Needs:

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: UTSC campus AccessAbility <http://www.utsc.utoronto.ca/~ability/> or St. George Campus DisAbility disability.services@utoronto.ca or <http://studentlife.utoronto.ca/accessibility>. **The University reserves the right to change any aspect of this course outline.**