

GEOLOGY 460:301 MINERALOGY**FALL 2019***Lectures:* Room 308: Monday 10:20-11:40 am, Wednesday 1:40-3:00 pm*Lab:* Room 339: Monday 12:00-3:00 pm
(Teaching Assistant Winnie Liu; wl398@eps.rutgers.edu)*Instructor:* C. Herzberg (445-3154), Room 342, Wright Laboratory
(herzberg@eps.rutgers.edu).*Text:* Optional: Introduction to Mineralogy (2nd Ed), William D. Nesse
(several text books are provided in Room 339 for student use)

DATE	CLASS	TOPIC	READING	
Sept	4	1	Introduction	
	9	2	Ionic bonding, size & coordination	Ch 3, 4
	11	3	Crystal symmetry, elements	Ch 2
	16	4	Crystal systems, axes, miller indices	Ch 2
	18	5	Optical Microscopy	Ch 7
	23	6	Anisotropic Minerals	Ch 7
	25	7	Interference colors, extinction	Ch 7
	30	8	Uniaxial & Biaxial Optics	Ch 7
Oct	2	9	A Story of the Earth	Ch 7
	7	10	Physical Properties of Minerals	Ch 5,6
	9	11	EXAM 1	
	14	12	X-rays, methods in mineral analysis	Ch 8,9
	16	13	Mineral Chemistry	Ch 8,9
	21	14	Electron Microprobe Day	
	23	15	Orthosilicates I (olivine)	Ch 16
	28	16	Orthosilicates II (garnet, aluminosilicates, zircon)	Ch 16
	30	17	Chain Silicates (pyroxenes & amphiboles)	Ch 14
Nov	4	18	Sheet Silicates I	Ch 13
	6	19	Sheet Silicates II	Ch 13
	11	20	EXAM 2	
	13	21	Framework Silicates I (quartz; feldspathoids; zeolites)	Ch 11
	18	22	Framework Silicates II (feldspars)	Ch 11
	20	23	Oxides, hydroxides	Ch 18
	25	24	Sulfides, Native Elements, Carbonates, Phosphates	Ch 17,19, 20
	27		No class	
Dec	2	25	Mineral Evolution	
	4	26	Crust & Mantle	
	9	27	No Class	
	11	28	Review	
	18		Exam 3* 10:20-11:40 am Room 308	

* Exam 3 is NOT a final exam.

Handouts of the lecture material will be handed out at the beginning of each class.

Final grade: 25% Lab work, 25% Exam 1, 25% Exam2, 25% Exam 3

Office Hours You can see me anytime Monday to Friday, 9am to 5pm, but please call to be sure I am in my office before you come across campus. E-mail is best for simple questions.

Learning Goals

There are 2 main goals in mineralogy.

- 1) **Mineral Identification:** to learn to identify minerals using the hand specimen but, more importantly, the optical microscope, in addition to more advanced methods such as the electron microprobe and scanning electron microscope. Students will be trained to observe at scales that range from the microscopic to planetary.
- 2) **Mineralogical Records of the Earth & Cosmos:** to understand the practical use of minerals to understand the origins of sedimentary, igneous, and metamorphic rocks & samples of extraterrestrial origin. For example, we use minerals to understand volcanoes on Hawaii, the Appalachian Mountains, climate change & biological evolution on Earth, the search for extraterrestrial life on Mars. Minerals help us to understand the cosmological, geological and biological processes which form them.

Policy on Classroom Etiquette

Department of Earth and Planetary Sciences Rutgers University, The State University of New Jersey, Piscataway, NJ

The Department of Earth and Planetary Sciences is committed to teaching excellence, fostering close interaction between students and faculty. While recognizing that large lecture classes are required to serve the demand for 100- and 200-level introductory course, the department has made concerted effort to avoid offering courses larger than 140 students whenever practicable. At all levels, we demand that instructors (Professors, Lecturers, and Teaching Assistants) AND students display appropriate respect and consideration for each other. Instructors should try to infuse students with an enthusiastic appreciation of Geological Sciences, be well prepared for class, provide students with clear goals and expectations, listen carefully to student questions and comments, and conscientiously evaluate students' work. Students are expected to attend the scheduled classes and to behave courteously in class. Together, instructors and students will maintain an environment of openness and civility that encourages and honors the intellectual achievement represented by the discipline of Geological Sciences. Rules on exams, attendance, tardiness/leaving early, and integrity are outlined below. As rules vary somewhat for each course and for each instructor, student should be familiar with those particular rules as outlined by each instructor for each course. Any uncertainties or questions should be clarified by asking the course instructor.

Exams: Every effort must be made to take exams when scheduled. No unexcused make-up exams will be given without WRITTEN documentation from a Rutgers University official. Those with valid excuses will be allowed to take exams in a method determined by the instructor.

Attendance: Students are expected to attend class; attendance is one of the best prognosticators of a student's performance. If a student cannot attend a class or must leave early, he/she should inform the instructor and ask to be excused. Instructors may require signed attendance sheets and may count attendance as part of the grade. Falsification of an attendance record by signing another student's name or signing and then leaving class is a serious breach of academic integrity.

Tardiness and Leaving Class Early: Rutgers is geographically challenged. Students must commute considerable distances between classes and instructors are aware of problems that students encounter in trying to come to class on time. Students should try to not schedule courses on different campuses in adjacent periods. We recognize that some tardiness is inevitable; HOWEVER, habitually arriving in class late and departing early is disruptive and rude. We ask that once you make every effort possible to get to class on time, and once there, STAY.

Personal Conversation: It is rude and disruptive to engage in personal conversation during class. Students who persist in this disruptive behavior may be asked to leave the class and may be penalized as absent. Refusal to leave class once requested will result in disciplinary action at the Dean's level. **Cell phones and beepers should be turned off in class.**

Academic Integrity: Our department fully endorses a no-tolerance cheating and plagiarism policy. If you are caught cheating, the instructor may fail you and request disciplinary action.

Current Academic Integrity Policy: <http://academicintegrity.rutgers.edu/integrity.shtml>
Violations include: cheating, fabrication, plagiarism, denying others access to information or material, and facilitating violations of academic integrity.

Your Rights: We are all human and instructors and students both make mistakes. If you feel that you have been treated unfairly, contact the department chair Dr. Carl Swisher (cswish@rci.rutgers.edu).

Modified from policy of the Department of History, Rutgers, The State University of NJ Voted on as Departmental Policy by on January 17, 2000