

Course Syllabus

Course Information

(course number, course title, term, any specific section title)

GEOS 2409: Rocks and Minerals

Professor Contact Information

(Professor's name, phone number, email, office location, office hours, other information)

W. I. Manton, Room FO 3.620B, Phone 972-883-2441, email: manton@utdallas.edu

Office Hours: Mon & Wed 2-5pm or by appointment

Course Pre-requisites, Co-requisites, and/or Other Restrictions

(including required prior knowledge or skills)

Pre- or co-requisite GEOS 1303 and lab

Course Description

The title is historic. Crystals, minerals and rocks is more accurate, because before you can understand minerals you have to know something about crystals and before you can understand rocks you have to know something about minerals.

Part 1: Crystallography

Concept of a space lattice and unit cell. The 14 Bravais lattices. Indexing lattices. The crystal systems. Symmetry elements. Plotting planes and axes on a stereogram. The 32 crystal classes. Miller indices and crystal faces. Crystal forms. Plotting poles to forms on a stereogram. The forms present in some selected crystal classes, including positive and negative forms, first and second order forms, and left and right-handed forms. Twinned crystals.

Part 2: Mineralogy

Division into rock-forming minerals and ore minerals. Identifying minerals by macroscopic physical properties. Classification of the non-silicate minerals by chemical composition and the most important representatives of each class. The rock-forming silicate minerals: feldspars, feldspathoids, olivines, pyroxenes, amphiboles, garnets, and micas. Accessory silicate minerals. The clay minerals. Ionic radius, coordination number, Pauling's rules and the classification of silicate minerals based on their internal structure.

Part 3: Petrology

Igneous processes and the classification of igneous rocks. Magmatism and tectonics.

Sedimentary rocks, clastic and non clastic including the evaporites. Concept of sedimentary facies. Maturity of a clastic sediment. Sedimentary structures.

Metamorphic rocks. Concept of metamorphic facies. Contact metamorphism. Regional metamorphism and the development of metamorphic fabric. Retrograde metamorphism.

Cataclastic rocks—breccias, cataclasites, mylonites and pseudotachylites. Kinematic indicators.

Student Learning Objectives/Outcomes

1. The principles of symmetry that underpin the crystalline state
2. The use of the stereographic projection
3. The naming of the faces present in each crystal class
4. The chemical formulae and the names of naturally occurring oxides, halides, carbonates, sulphates and phosphates
5. The chemical formulae and the names of the principal silicate minerals of igneous and metamorphic rocks
6. Ability to recognize minerals in hand specimen
7. How silicate minerals are classified based in their internal linking of SiO_4 tetrahedra.
8. The recognition and field classification of igneous, sedimentary and metamorphic rocks
9. Interpretation of textures and fabrics

Required Textbooks and Materials

Simon & Schuster's Guide to Rocks and Minerals will suffice though it lacks any treatment of stereograms and skimps on the crystal forms. It will be supplemented by handouts..

For mineralogy and petrology labs, a 10x or 12x hand lens and a small-bladed pocket knife.

Suggested Course Materials

Klein & Dutrow's Mineral Science 23e (Wiley) has no treatment of rocks but is an authoritative reference on crystallography and mineralogy and would be an invaluable addition to your permanent geological library if you plan to make geology your profession. Earlier editions may be cheaply obtained and are still useful.

Assignments & Academic Calendar

(Topics, Reading Assignments, Due Dates, Exam Dates)

Aug 21 through Sept 18	Lectures on crystallography Labs on crystal models	Sept 25 through Oct 23	Lectures on topics in mineralogy. Labs on mineral identification	Oct 30 through Dec 2	Lectures on petrology and field identification Labs on identification and interpretation of textures
Sept 23	Test 1 Crystallography (Includes both lecture and lab topics)	Oct 28	Test 2 Mineralogy (Includes both lecture and lab topics)	Dec 16 8am Yes, 8am!	Final (Includes both lecture and lab topics)

Grading Policy

(including percentages for assignments, grade scale, etc.)

95-100 A+	81-85 B+	66-70 C+	51-55 D+
91-95 A	76-80 B	61-65 C	46-50 D
86-90 A-	71-75 B-	56-60 C-	40-45 D-

Laboratories will count 33% of final grade

Course & Instructor Policies

(make-up exams, extra credit, late work, special assignments, class attendance, classroom citizenship, etc.)

Tests will be taken only during the scheduled in-class period, unless the instructor agrees to reschedule an individual's test as the result of a prior agreement, or a doctor's excuse certifies the student was too ill to attend class the day of the examination. If you have health problems, or extenuating circumstances, please contact the instructor as soon as possible so arrangements can be made.

Field Trip Policies

Off-campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.

There are no field trips in this class.

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(make-up exams, extra credit, late work, special assignments, class attendance, classroom citizenship, etc.)

Technical Support

If you experience any problems with your UTD account you may send an email to: assist@utdallas.edu or call the UTD Computer Helpdesk at 972-883-2911.

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Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD printed publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Series 50000, Board of Regents, The University of Texas System*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972-883-6391) and online at <http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html>

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic Dishonesty, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Copyright Notice

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UT Dallas student, you are required to follow the institution's copyright policy (Policy Memorandum 84-1.3-46). For more information about the fair use exemption, see <http://www.utsystem.edu/oge/intellectualproperty/copypol2.htm>

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:
The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)
disabilityservice@utdallas.edu

If you anticipate issues related to the format or requirements of this course, please meet with the Coordinator of Disability Services. The Coordinator is available to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Services to notify them of your eligibility for reasonable accommodations. Disability Services can then plan how best to coordinate your accommodations.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

These descriptions and timelines are subject to change at the discretion of the Professor.

