

GEOL 4200: GEOLOGICAL EXPLORATION TECHNIQUES (4 Credits)

Lecture: MWF 11:15am – 12:10pm

Lab: T 9:00 – 10:50am

Course Description: Practical techniques for geological exploration, with emphasis on environmental, mining and petroleum industry applications. Surface and subsurface methods include geological mapping, drilling, core extraction, wireline logging and 2D/3D seismic.

Prerequisites: GEOL 1040 (The Dynamic Earth), GEOL 1045 (Earth, Environment, Resources and Society) and GEOL 2500 (Geological Fundamentals).

Instructor: Dr. Jeannette Wolak, Department of Earth Sciences

Office: Kittrell 305 | **Email:** jwolak@ntech.edu | **Phone:** (931) 372 – 3695

Office Hours: MW 12:10 – 1:00pm and by appointment. I have an *open-door* policy and strongly encourage you to bring questions by at any time.

Recommended Texts:

I recommend that you purchase one of these two texts. Purchase the one that best fits your career plans.

Geological Methods in Mineral Exploration and Mining (2nd Edition, 2010) by Roger Majoribanks
Elements of Petroleum Geology (2nd Edition, 1998) by Richard C. Selley

Online Tools:

iLearn - <https://elearn.ntech.edu/>

Access to supplementary lecture and homework materials will be available through iLearn.

Grading Summary:

Lecture	
In-class Participation	5%
Homework (Take-home readings, iLearn assignments)	10%
Exam #1 (Prospecting/Mining Techniques)	15%
Exam #2 (Petroleum Exploration Techniques)	15%
Exam #3 (Seismic Interpretation)	15%
Lab	
Lab Exercises	20%
Project #1 (Prospecting/Mining Project)	10%
Project #2 (Petroleum Exploration Project)	10%

Your final grade will reflect both lecture (60%) and lab (40%) components.

Mandatory Field Trip: We will take at least *one mandatory Saturday field trip*. More details will be provided to you in lecture.

Attendance Policy: Given the hands-on component of the course, attendance at all lectures and labs is mandatory. If you have a conflict, please contact me as soon as possible and refer to the make-up policy below.

Make-up Policy for Exams and Late Work: Make-up exams will be available on a case-by-case basis. If you have a conflict and miss an assignment or exam, please contact me via email or phone. Late work will be accepted up to one week late at a penalty of 10%. Please note: Once an assignment has been handed back to the class, it is too late to turn in your late work!

Materials List: Please bring the following materials to lecture and lab every time we meet. This is a geology course focused on techniques used in geologic exploration. It is also an opportunity for you to develop professional skills such as organization and technical drawing/note-taking.

- Three Ring Binder – Please keep up with the handouts and notes for this course.
- Jump Drive
- Highlighter
- Colored pencils
- Calculator
- Small bottle of HCl acid (will be provided to you)
- Grain size chart (will be provided to you)
- Hand lens [I recommend a 10X as a starter lens to see grain structure, ooids, etc. Higher magnifications are useful if you are paleo-minded, e.g., identification of very tiny foraminifera. Cheap lenses are sometimes available at Hobby Lobby. Amazon and other online dealers have many lenses to choose from. I will provide lenses for the first two weeks of class; otherwise, *please bring your own hand lens.*]
- Lanyard for hand lens and grain size chart (optional, TTU ones available at bookstore)

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