

GEOL5315/GEOL6315 (CRN: 29042/29045)

Geochemical Techniques

M/W 9:00-10:20

Geology 404

Instructor: Lixin Jin, Geology 221A, ljin2@utep.edu

Textbook: None

Overall Goals:

- Introduce basics in laboratory routines, experimental design, data acquisition and quality control;
- Provide hands-on opportunities to use common techniques in Geochemistry-related research;
- Foster the development of a project in applying the geochemical techniques to address different Earth and Environmental Science problems;
- Better communication through discussion and oral presentations.

Grading: Participation (10%), exercises (30%), Journal discussion (20%), and group project (40%)

***The schedule is tentative:**

Week*	Topic (M)	Topic (W)	Exercise
Week1		Introduction, NSF project	E1: Download data
Week2	Data quality control	Lab basics/making standards	E2: Calibration
Week3	Field design, sample collection and preparation	LiBO ₂ fusion/sequential extraction	Journal Discussion (Fe speciation, sequential extraction)
Week4	Water quality (EC meter)	Soil quality	
Week5	Mineralogy (XRD, clays)	XRD laboratory	E3: Identify minerals
Week6	Elemental Chemistry	XRF	
Week7	Ion Chromatograph	ICP-OES/ICP-MS	Journal Discussion (synchrotron based)
Week8	Spring Break	Spring Break	
Week9	Elemental analyzer (C/S)	C-14 dating	
Week10	Sensors/spectroscopy analyses	Mixing curves	Journal Discussion (mixing)
Week11	SEM and electron microscope	SEM laboratory (BSE and SE)	
Week12	Isotope analyses (theory)	Lab visits (MC-ICP-MS, IRMS, etc)	
Week13	Geochemical modeling	Modeling lab	Journal Discussion (Isotopes)
Week14	Integration	Anything else?	
Week15	Group project presentation	Group Project presentation	

Group project (group of 2 ; 30 minutes of presentation): Proposal style with significance, detailed plan of action, budget and timeline

Potential Topics :

1. Health impacts of dust in Southwestern USA
2. Evaluation of environmental impacts of Pb mining in Pennsylvania
3. Eutrophication of Lake Meade by agriculturally-derived fertilizers

COURSE POLICIES

POLICY ON CIVILITY: Please come to class on time. It is disturbing and distracting everybody if people come in late. Please do not hold private conversations during lectures, but feel free to ask questions or start a discussion at any time. Cell phones **MUST** be turned off during class. **DO NOT** answer phones while in class.

Disability Statement: I will make any reasonable accommodations for students with limitations due to disabilities, including learning disabilities. Please see me personally before or after class in the first two weeks or make an appointment, to discuss any special needs you might have. If you have a documented disability and require specific accommodations, you will need to contact the Center for Accommodations and Support Services (CASS) in the East Union Bldg., Room 106 within the first two weeks of classes.

Military Statement: If you are a military student with the potential of being called to military service and /or training during the course of the semester, you are encouraged to contact me no later than February.

POLICY ON HOMEWORK: All assignments are to be individual efforts unless specifically told otherwise. This policy will be strictly enforced.

POLICY ON ACADEMIC HONESTY: Cheating is unethical and not acceptable. Plagiarism is using information or original wording in a paper without giving credit to the source of that information or wording: it is also not acceptable. Do not submit work under your name that you did not do yourself. You may not submit work for this class that you did for another class. If you are found to be cheating or plagiarizing, you will be subject to disciplinary action, per UTEP catalog policy. Refer to <http://www.utep.edu/dos/acadintg.htm> for further information.

POLICY ON ELECTRONIC DEVICES: Use of **laptops** during class is not permitted, except for class assigned presentations. The necessity of classroom interaction in this course negates the usefulness of laptops as a note-taking device. The use of your laptop during class can also prove distracting to your classmates, so please refrain from using your laptop during class. Use of **cell phones or other wireless devices are not permitted.**

- Set your phone to mute or silent mode before coming to class.
- Do not answer incoming calls or make outgoing calls except in an emergency.
- Do not use text messaging or web browser features while in class.

If you choose not to comply with these policies you will be asked to leave the classroom