

## **Geol 525: Advanced Metamorphic Petrology (Fall 2016)**

Advanced course in metamorphic petrology. This course emphasizes the quantitative analysis of phase relations to reconstruct the pressure-temperature-time histories of metamorphic terranes. (5 credits).

*Prerequisites:* GEOL 406; GEOL 407 (or permission of instructor).

**Instructor** Sean R. Mulcahy

**Email** [sean.mulcahy@wwu.edu](mailto:sean.mulcahy@wwu.edu)

**Office** ES 204

**Office Hours** Tues. 11:00-12:00, Wed. 2:00-3:00, or by appointment.

### **Location and Time**

ES 218

Monday and Wednesday, 11:00 - 11:50

Friday, 10:00 - 12:50

### **Course Outcomes and Learning Objectives**

- Describe the factors that control the stability of metamorphic mineral assemblages
- Use graphical methods to interpret metamorphic mineral assemblages
- Quantify metamorphic conditions using classic methods of thermobarometry
- Quantify metamorphic paths using multi-equilibrium thermobarometry and pseudosections
- Estimate fluid flux and reaction progress during metamorphism and metasomatism

### **MS Degree/Program Outcomes**

Click the linked text for the complete list of [Geology MS Program Outcomes](#).

3. Analyze and interpret scientific data
4. Communicate scientific concepts and results effectively through written and oral means

### **Text**

No official text. Readings will be assigned from various textbooks available in the classroom and from primary literature.

### **Grading standards**

The grade in this course is based on the following:

#### **Problem sets and labs (60%)**

Each week students will be given a problem set based on the week's lecture material. Problem sets will include a combination of hand samples, thin sections, and quantitative problems to calculate metamorphic conditions and histories. Graduate student problem sets will include additional problems and a deeper level of analysis.

## Field Trip (10%)

Oct. 8th and 9th. This will be 2-day field trip with overnight camping to explore the metamorphism of the Cascades crystalline core.

## Discussion (10%)

Each week we will read and discuss an important paper related to the lecture material and problem set. Discussions will occur in class and online via Canvas. Graduate students will lead and facilitate the discussions.

## Final Exam (20%)

A cumulative Final Exam will be given as a take home exam.

## Calculating your grade

Your grade for the course will be calculated according to the following equation:

Course Grade = 0.6(Avg. Lab Grade) + 0.1(Field Trip Grade + Discussion Grade) + 0.2(Final Exam Grade)

Letter grades will be assigned by the scale below. As a general rule I do not round grades. I reserve the right, however, to round grades up or down depending on student attitude, participation, and overall contribution to the course.

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-
Score	92.5	90.0	87.5	82.5	80.0	77.5	72.5	70.0	67.5	62.5	60.0

**IMPORTANT NOTE!** Canvas weights grades differently and as a result, the Canvas grade is not accurate. You can calculate your grade using the equation above. If you have questions about doing this, please see me and I can confirm your actual percentage.

## Microscope Keys

Pay your microscope key deposit at [https://commerce.cashnet.com/WWU\\_GeologyDept](https://commerce.cashnet.com/WWU_GeologyDept) and pick up your keys from the front office.

## Academic Integrity

All students are to uphold the [WWU Academic Honesty Policy and Procedures](#).

Academic integrity means challenging yourself, striving for excellence, taking risks and learning from your mistakes, doing your own work, and giving credit whenever you use the work of others. See me if you have any concerns or questions about academic integrity regarding yourself or your classmates.

## Reasonable Accommodation

Reasonable accommodation for persons with documented (dis)abilities should be established within the first week of class and arranged through disAbility Resources for Students: phone 650-3083; email [drs@wwu.edu](mailto:drs@wwu.edu); and on the web at [disAbility Resources](#).

**This syllabus is subject to change**

Changes, if any, will be announced in class. Students are responsible for all changes.