

## **Basin and Range Seminar (Geo 4200/5200)**

Spring 2019, Monday 1:10-3:00 PM Room Geology 318  
Credits: 2 S/U

**Instructor:** Dr. Kenneth W. W. Sims  
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**Phone:** 766-3306

**Office Hours:**  
TR 11:00 – 12:00 PM  
TR 2:45 – 4:00 PM

### **Course Aims:**

The aims of the course are to:

- 1) Understand the geography and geology of Basin and Range
- 2) Understand the initiation and geology of the Rio Grande Rift
- 3) Understand the sources and processes of Basin and Range magmatism
- 4) Appreciate the variations of compositional and eruptive behavior of extensional magmatism in the US and elsewhere

### **Course Skills:**

Throughout this course you will improve on several skills, including: learning how to search out relevant literature, summarizing complex scientific documents, oration, scientific dialogue, and most importantly critical thinking.

### **Class Format:**

The class will rely principally on careful reading and student-led summary, with discussion of published research papers on Basin and Range Volcanism. An important goal of this seminar will be critical thinking, so the presentation will consist of both a discussion of the chosen literature and will be summarized by either an actual or thought experiment which demonstrates or tests the concepts being proposed.

## **COURSE DETAILS:**

### ***Responsibilities:***

A high level of class participation is required. Every person is required to read all papers and come to class each day with three different and relevant questions/discussion points based on the reading. All absences need to be cleared by me, excessive absences will result in a failing grade.

### ***Class Structure:***

One the first week of class everyone will sign up for a day to present a paper relevant to the topics laid out on the syllabus.

At the start of each class every person will turn in a list of three discussion questions that will guide their discussion should they be chosen as discussion leader and I will give a presentation on basic topics relevant to the course or discussion (5-15 minutes).

Each student will be part of a group that will make a 40-minute presentation of the assigned paper that the class has read, using power-point. These presentations should include summaries of the scientific problem(s) addressed, data and methodologies, and conclusions drawn. Be sure to include figures from the paper and any relevant background material in your PowerPoint. This group/person will also present a relative, simple thought or physical experiment. This experiment should be structured to take about 10 minutes of class time. This group will meet with me the week before their presentation and experiment.

After the presentation there will be a 30-minute discussion led by a different class member. This discussion leader will be chosen randomly by picking marbles from a bag. The person that picks the odd-colored marble becomes the discussion leader and must go to the board and write down their 3 questions and lead a 40-minute discussion

### ***Field Trip (April 18-22; depart Thursday noon-return Monday evening):***

There will be a field trip down the Rio Grande Rift to the Jemez Volcanic Field. This field trip is non-compulsory and as such will not serve as an excused absence from another course. The department will cover the costs of transportation and campground fees, but the participants will pay for food. The participants will also provide their own cooking and camping supplies; please coordinate food and equipment so as to not overload vehicles.

### ***Grading:***

This course should be taken pass/fail (S/U). Assessment of satisfactory participation will be based on class participation, presentations and discussion leadership. There will be no exams, and no final. The following criteria will be considered for grading.

- *Leading seminar discussion.* Discussions should aim to make sure everyone understands the paper and should include an exploration of unsolved problems. This seminar discussion will be concluded by a thought or actual experiment.

- *Class participation.* This class depends on vigorous discussion and exchange of ideas. Ask questions when you don't understand something; voice your opinion when you disagree with something.

***Email communication:***

Use distinct and clear subject headers and proper salutations.

***What Is Expected of You:***

- Regular attendance and undivided participation. No e-devices, laptops, phones, pads etc. (unless you are presenting)
- Read the assigned papers in advance and prepare for the group discussion. It is impossible to intelligently discuss a paper one hasn't read.
- Relax and have fun with the topics in this seminar. This isn't a lecture course, with a rigidly prescribed set of material to master. The goal is for you to learn and then think creatively about processes and make connections between the topics. For many of you this course is directly related to your thesis; let us know about how it relates, so we all learn new things!
- Those attending the field trip will present on a topic at a given field stop as decided by me two weeks in advance of the trip.
- Those attending the field trip are expected to behave in a professional manner in all circumstances

***What You Can Expect of me:***

- Provide supplementary lecture material and help stimulate discussions during class.
- Be accessible and always be happy to answer your questions during class, during office hours, and by appointment.
- Run a professional, structured, well-considered trip.

***Course Readings***

There is obviously no suitable text for this course. Consequently, we (collectively) will send out a PDF of the paper(s) we are discussing on WyoCourses ~ 1 week in advance of the class.

**Weekly Course Schedule (papers listed below are tentative and may be changed)**

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**Field Trip: Rio Grande Rift, Jemez Volcanic Field and Jemez Lineament Field Trip  
April 18-22. (Depart Thursday noon; Return Monday evening)**

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**January 28** Organizational Meeting and course introduction

**February 4 (1)** Basin and Range Tectonics (Dickinson, 2006)

**February 11 (2)** Initiation of the Rio Grande Rift (Keller & Baldrige, 1999)

**February 18 (3)** Isotopic mapping of the development Rio Grande Rift (Perry et al. 1988; and, Daley and DePaolo, 1992)

**February 25 (4)** Early Bi-Modal Volcanism in the Rio Grande Rift/Development of the Jemez Volcanic System (McMillan et al., 2000 and Baldrige et al. 1980)

**March 4 (5)** Intermediate composition magmas in the Jemez Volcanic Field/ Magma mixing etc. Eichelberger, 1980, and Sparks, 1983).

**March 11 (6)** Silicic Magmas in the JVF/ Development of the Valles-Toledo Calderas/Eruption of the Bandelier Tuff (Spell and Kyle 1989, with Smith and Bailey, 1966)

**March 18** *No Class Spring Break*

**March 25 (7)** Basaltic Volcanism along Jemez Lineament Mt Taylor Volcanic Field/ Carrizozo Malpais/Raton- Clayton VF (Crumpler, L.S., and Aubele, J.C., 2001, Volcanoes of New Mexico: An Abbreviated Guide for Non-Specialists: Volcanology in New Mexico, New Mexico Museum of Natural History and Science Bulletin 18; Smith and Kudke, 1984)

**April 1 (8)** The overall structure of the Northern and Central Rio Grande Rift (Chapin and Cather, 1994)

**April 8 (9)** Monogenetic basaltic volcanism across the Basin and Range (Valentine and Perry, 2007; Yogodzinski et al., 1996)

**April 15 (10)** Eruptive products and processes of small volume basalt eruptions (Valentine et al., 2008)

**Field trip April 18-22**

**April 22** *No Class*

**April 29 (11)** Bubble Dynamics (Sparks 1978)

**May 6** LN Volcano

## IMPORATANT OBLIGATORY MESSAGES:

- 1) **Cheating.** University Regulation 2-114, defines academic dishonesty as “an action attempted or performed that misrepresents one’s involvement in an academic task in any way, or assists another student in misrepresenting his or her involvement in an academic endeavor”. There is a well-defined procedure to judge such cases, and serious penalties may be assessed. In this class, your exams and homework are expected to be your work ONLY.
- 2) **Conduct.** University Regulation 29, change 1, states that the instructor can “establish reasonable standards of conduct for each class which should be made known at the outset.” In this class I expect engagement and participation, including regular attendance, and that we all treat each other with courtesy and respect. This does not mean we have to agree with each other!
- 3) **A&S - Students and Teachers Working Together.**  
A 6-page document is available at:  
  
[http://www.uwyo.edu/as/\\_files/current/students%20and%20teachers%20working%20together.pdf#students%20and%20teachers%20working%20together](http://www.uwyo.edu/as/_files/current/students%20and%20teachers%20working%20together.pdf#students%20and%20teachers%20working%20together)  
  
This document lays out the guidelines for the course syllabus, attendance, classroom deportment (no sleeping or cell phone use!), phone and email protocol, office hours and how to make appointments outside of office hours. Good stuff.
- 4) **Disabilities.** If you have a physical, learning, or psychological disability and require accommodations, please let the instructor know immediately. You will need to register with, and provide documentation of your disability to, University Disability Support Services (UDSS) Room 109 Knight Hall. You may also contact DSS at (307) 766-3073 or [udss@uwyo.edu](mailto:udss@uwyo.edu). It is in the student’s best interest to request accommodations within the first week of classes, understanding that accommodations are not retroactive. Visit the DSS website for more information at: [www.uwyo.edu/udss](http://www.uwyo.edu/udss).
- 5) **Classroom Statement on Diversity:** The University of Wyoming values an educational environment that is diverse, equitable, and inclusive. The diversity that students and faculty bring to class, including age, country of origin, culture, disability, economic class, ethnicity, gender identity, immigration status, linguistic, political affiliation, race, religion, sexual orientation, veteran status, worldview, and other social and cultural diversity is valued, respected, and considered a resource for learning.
- 6) **Duty to Report:** While I want you to feel comfortable coming to me with issues you may be struggling with or concerns you may be having, please be aware that I have some reporting requirements that are part of my job requirements at UW.

For example, if you inform me of an issue of sexual harassment, sexual assault, or discrimination I will keep the information as private as I can, but I am required to bring it to the attention of the institution’s Title IX Coordinator. If you would like to talk to those offices directly, you can contact Equal Opportunity Report and Response (Bureau

of Mines Room 319, 766-5200, [report-it@uwyo.edu](mailto:report-it@uwyo.edu), [www.uwyo.edu/reportit](http://www.uwyo.edu/reportit)). Additionally, you can also report incidents or complaints to the UW Police Department. You can also get support at the STOP Violence program ([stopviolence@uwyo.edu](mailto:stopviolence@uwyo.edu), [www.uwyo.edu/stop](http://www.uwyo.edu/stop), 766-3296) (or SAFE Project ([www.safeproject.org](http://www.safeproject.org), [campus@safeproject.org](mailto:campus@safeproject.org), 766-3434, 24-Hour hotline: 745-3556).

Another common example is if you are struggling with an issue that may be traumatic or unusual stress. I will likely inform the Dean of Students Office or Counseling Center. If you would like to reach out directly to them for assistance, you can contact them by going to [www.uwyo.edu/dos/uwyocares](http://www.uwyo.edu/dos/uwyocares).

Finally, know that if, for some reason, our interaction involves a disruptive behavior or potential violation of policy, I will inform the Dean of Students, even when you and I may have reached an informal resolution to the incident. The purpose of this is to keep the Dean apprised of any behaviors and what was done to resolve them.

- 7) **Final Disclaimer:** As the instructor I reserve the option to make changes to the schedule (particularly the suggested readings) throughout the course. Changes will be announced in class or via e-mail.

## **Trip Details**

**Location:** Great Sand Dunes down Rio Grande Rift to the Jemez Volcanic Field

**Dates:** April 18-22

**Depart:** April 18, Thursday 12 Noon or earlier.

**Return:** April 22, Monday evening ~ 6PM

The department will cover the costs of transportation and campground fees, but the participants will pay for food.

No private student cars.

Participants will also provide their own cooking and camping supplies. Please coordinate food and equipment so that you are cooking as 1 or 2 groups max. Please also share tents so as to not overload camp sites and vehicle storage.

### Car Rental

3-5 Large SUVs

Pick up: 4/18/19 at 8:00am

Drop off: 4/22/19 at 5:00pm

### Great Sand Dunes Campsite

Pinon Flats Campground, Group Site A in Group Loop (big enough for 50 people)

Check in: 4/18/19

Check out: 4/19/19

### Bandelier Campsite

Juniper Campground, Group Sites 001 and 005 in Albert's Squirrel Loop (big enough for 20 people)

Check in: 4/19/19

Check out: 4/22/19

Day 1 (04/18; Thursday): Leave UW at noon; camp at Great Sand Dunes NM.

Day 2 (04/19; Friday): Rio Grande Rift; Camp at Bandelier NM.

Day 3 (04/20; Saturday): Southern Jemez; Camp at Bandelier NM.

Day 4 (04/21; Sunday): Northern Jemez; Camp at Bandelier NM.

Day 5 (04/22); Monday): Drive back to UW up I-25