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Spring 2-1-2022

### GEO 568.01: Climate Sensitivity and Feedbacks

Joel T. Harper

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## ***Climate Sensitivity and Feedbacks (Geo 568)***

3 credits.

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Note: *This Course has a Moodle Site. A detailed class schedule and other information will be posted there with frequent updates, so check the site regularly.*

### **Instructor information**

Dr. Joel Harper

Office: ISB 406-C

Office ph: 406.243.5867

e-mail: [Joel@mso.umt.edu](mailto:Joel@mso.umt.edu) (email is the best way to reach me. I check it often)

### **Office hours**

Tuesdays, 4.00-5.00; Wednesdays, 11.00-12.00.

### **Course objective**

Climate sensitivity is a metric of the Earth's climate system which describes the temperature change resulting from a radiative imbalance (forcing). Our estimates of climate sensitivity reflects all feedbacks, internal dynamics, and uncertainties that amplify or dampen forcings. This graduate course examines the past, present, and future climate change via the climate sensitivity metric. We investigate the many feedback mechanisms in the climate system, the time scales of climate system response, and the methods for estimating our climate system's sensitivity to greenhouse gas forcing.

### **Learning outcomes**

*Students will be able to:*

- describe climate sensitivity and the various time scales of climate forcing/response.
- describe the different methods for estimating climate sensitivity from models and observations.
- describe the major feedbacks often attributed to uncertainty in climate sensitivity.

### **Format**

Classes will consist of mini-lectures, readings, and discussions. A major component of this course is completing the assigned reading and preparing for class discussions. As a graduate course, the tables will be turned and students will have some responsibility for defining the learning objectives and driving content delivery.

### **Prerequisites**

Graduate standing in a science discipline. Open to advanced undergraduates with science backgrounds with permission of the instructor.

### **Course text**

No text required. Readings will be posted on Moodle.

### **Evaluation criteria for letter grade**

1. Attendance and engagement in class discussions.
2. Written reviews of lectures and readings.
3. Two teaching assignments.

### **Policies**

#### **Emailing**

I will occasionally conduct email correspondence with class members and will use official UM email addresses. Check this account! All email sent to me must originate from your official UM email address. Email originating from non-UM addresses cannot be read or responded to (Sorry, but this is a University rule we are required to follow).

#### **Attendance**

The format of this course requires class attendance for success. Substantial course content (i.e., lectures and in-class discussions) as well as most information transfer will only occur in class. This is not a good course for you if you expect to miss class.

#### **Due dates**

All assignments are due at the start of class on designated due date.

#### **Disabilities**

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

#### **Conduct Code**

*All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at: <https://www.umt.edu/safety/policies/default.php>*