

PHYS 428 Climate Physics

Spring 2018
Workman 352
MWF 1-1:50 pm

Instructor: Sharon Sessions
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Office Hours: M 11 am, W 2 pm, and by appointment

Course Description:

This course, a continuation of PHYS 427, includes the dynamics needed to understand general circulation (e.g. Rossby waves), also covers basics in climate modeling and observations.

Pre-requisites/Co-requisites:

PHYS 427, MATH 332 and 335

Place in Curriculum:

This course is a requirement for students majoring in Physics with Atmospheric Physics option.

Course Learning Outcomes:

By the end of the course, students will understand basic concepts in atmospheric dynamics and general circulation and be able to apply them to climate physics. These include:

- Lagrangian and Eulerian descriptions of fluid flow
- Geostrophic and hydrostatic balance and their influence on the large scale flow
- Vorticity dynamics and quasi-geostrophy
- Driving mechanisms, instabilities, and persistent features in general circulation
- Interannual fluctuations and their influence on climate variability
- Influence of ocean structure and dynamics

Course Requirements:

Text: Murray L. Salby *Physics of the Atmosphere and Climate*

Attendance is strongly encouraged and students are responsible for understanding material presented in class. Students may work together on homework, but all work must be completed individually. Late homework is accepted under some circumstances and **must** be discussed with the professor. Grades will be based on homework assignments, participation in *Weather in a Tank* demonstrations, and a research paper and presentation on a topic related to Climate Physics.

Tentative Course Schedule:

Homework and due dates will be posted on the course website (www.physics.nmt.edu/~sessions/phys428/phys428.html). A timeline for for the research paper and presentation are also posted on course website.

Grading

Grades will be determined by:

- 50% homework assignments
- 30% research paper and presentation
- 20% weather in a tank demonstrations

Counseling and Disability Services:

Reasonable Accommodations

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http://www.nmt.edu/images/stories/registrar/pdfs/2013-2014_UNDERGRADUATE_Catalog_FINAL.pdf

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