

Instructor: Dr. Justin T. Schoof**Office:** Faner Hall 4537**Telephone:** 453-6019**Office Hours:** MW 8:30-9:30**E-mail:** jschoof@siu.edu**Meetings:** MWF 10-10:50 pm, Faner Hall 2533**Prerequisite:** GEOG 330, GEOG 330i, or graduate student status**Objectives:**

- To examine the components of the climate system and their interactions
- To understand the external and internal physical processes driving the climate system
- To develop skills related to assessment of human impacts on regional and global climate

Textbook (required): Rohli RV, Vega AJ. Climatology. Jones and Bartlett. 2008.

Other readings will also be assigned. I will make these available to you.

Course Outline:

1. Introduction: climate system components, scale issues, subfields, methods
2. Radiation: governing laws, earth/sun geometry, interaction with atmosphere, budgets and climate consequences
3. Temperature: surface energy budget, lapse rates and stability
4. Moisture: the hydrologic cycle, surface water budget, measures of humidity, fog, cloud formation mechanisms
5. Precipitation: physical processes, precipitation types
6. Pressure and Wind: causes of pressure patterns, forces and resulting winds, geostrophic flow, gradient flow, cyclostrophic flow, thermal wind
7. The General Circulation: function of the general circulation, the three-cell model
8. Tropical Climate: the Hadley Cell, ITCZ, monsoons, tropical cyclones, ENSO
9. Extra-tropical Climate: Rossby waves, cyclones, anticyclones, air masses, mid-latitude climate dynamics (jet streams, jet streaks, divergence, convergence, vorticity), polar climates
10. Local Climate: the boundary layer, surface interaction, urban climates
11. Human Interaction: impact of climate on humans, impact of humans on climate
12. Climate Modeling: simple models, global climate models, regional climate models
13. Future Climates: climate sensitivity and feedbacks, climate projections and potential impacts

Exercises:

Take-home exercises will be assigned to supplement lecture materials. Late exercises will not be accepted.

Exams:

Material covered in the lectures, readings, and exercises will be tested in exams. Questions will consist of multiple-choice, problems, short-answer, and essay questions. A make-up exam will ONLY be given in the event of illness that keeps you from attending the exam. Proper documentation will be required. In any case, it is YOUR responsibility to let me know BEFORE the exam that you will be unable to attend.

Assessment: Exercises	40%
Course Paper / Project	20%
Mid-term Exam	20%
Final Exam (Friday, 5/8, 7:50-9:50 am)	20%

Grading Scale: A: 90-100% **B:** 80-90% **C:** 70-80% **D:** 60-70% **F:** < 60%

Any student that may need an accommodation based on the impact of a disability or a military service related condition should contact me privately to discuss his or her specific needs. Also, please contact Disability Support Services at (618) 453-5738, DSSsiu@siu.edu, or visit Woody Hall B-150, to coordinate reasonable accommodations for documented disabilities.

This course strictly adheres to the conditions established in the SIUC Student Conduct Code: <http://www.siu.edu/~policies/policies/conduct.html>. Acts of academic dishonesty include:

1. Plagiarism, representing the work of another as one's own work;
2. Preparing work for another that is to be used as that person's own work;
3. Cheating by any method or means;
4. Knowingly and willfully falsifying or manufacturing scientific or educational data and representing the same to be the result of scientific or scholarly experiment or research;
5. Knowingly furnishing false information to a university official relative to academic matters;
6. Soliciting, aiding, abetting, concealing, or attempting acts of academic dishonesty.

These activities will not be tolerated. Violations will result in failure of the assignment or failure of the entire course.

Emergency Procedures:

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program.

Emergency response information is available on posters in buildings on campus, available on the BERT'S website at www.bert.siu.edu, Department of Public Safety's website www.d~s.siu.edu (disaster drop down) and in the Emergency Response Guidelines pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.