GEOG-230 – Meteorology, Climatology and Hydrology

University Arts and Science

Effective Term & Year: Fall 2022
Course Outline Review Date: 2025-04-01

Program Area: Math and Sciences

Description:

This course will examine the basic principles and processes governing the Earth's weather and climate, including the movement of water. In this course, students will analyze the linkages between the atmosphere, hydrosphere, and land surface interactions responsible for creating the weather and climate that we experience each day. Specifically we will examine fluxes of mass and energy exchanges, radiation, precipitation, winds, weather systems, fluvial hydrology, water balances, and global climates.

Program Information:

This course can be used as either a required course or an elective in several University Studies Programs. Refer to the College Program Guide for additional information.

Delivery Methods: On-campus (Face-to-Face)

Credit Type: College of the Rockies Credits

Credits: 3

Course type/s: Social Sciences, Sciences

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	
Laboratory/Studio	45

Practicum/Field Experience	
Co-op/Work Experience	
Other	
Total	90

Course Requisites:

- Completed the following:
  - GEOG101 – Introduction to Physical Geography 1 (3)

Flexible Assessment: Yes

In some cases students may be able to apply for recognition of prior learning outside the classroom. This flexible assessment process provides equivalent course credit. It is a rigorous process that may include external evaluation, worksite assessment, demonstration, standardized test, self-assessment, interview, products/portfolio, and challenge exam, or other measures as appropriate. Tuition fees apply. Contact an education advisor for more information.

Course Transfer Credit:

For information about receiving transfer credit for courses taken at either British Columbia or Alberta institutions, please see https://www.bctransferguide.ca/ or https://transferalberta.alberta.ca . For more transfer credit information, please visit https://www.cotr.bc.ca/Transfer

All requests for course transfer credit from institutions in British Columba or elsewhere should go to the College of the Rockies Enrolment Services office.

Textbook Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

Ross, S.l. 2013. *Weather and Climate: An Introduction*. Oxford University Press. 510 pp. ISBN 978-0-19-544587-9.

Please see the instructor's syllabus or check COTR's online text calculator https://textbook.cotr.bc.ca/ for a complete list of the currently required textbooks.

Learning Outcomes:

Upon the successful completion of this course, students will be able to:

- explain the vertical structure, composition, and large scale patterns of the Earth's atmosphere and climate systems and describe these patterns in terms of both thermodynamic and geographic controls;
- describe the role of water in the atmosphere and how water moves in the ground and overland;
- define and describe the local weather, climate, and hydrology processes and patterns that impact localities in British Columbia and the Columbia Basin;
- demonstrate foundational knowledge in climatology, meteorology, and hydrology in preparation for upper level and advanced topics in Geography and other subjects;
- describe the impact of human activities on global climate;

Demonstrate competence in:

- methods to gather climate data, including use of basic meteorological and hydrological instrumentation
- scientific research and data analysis including: the construction and reading of graphs; use of spreadsheets, and online weather products;
- communicating science including: written, numeric, graphic, and oral methods; and
- working collaboratively with other students and teams.

Course Topics:

1. Atmospheric composition and structure
2. Radiation pathways and energy balance
3. Daily and seasonal temperature variation
4. Atmospheric pressure and motion
5. Winds at different spatial scales
6. Atmospheric humidity, clouds, and precipitation
7. Air masses, fronts, and storms
8. Fluvial hydrology and floods
9. Water balance, process and pathways
10. Global climates
11. Climate change and variability

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

Evaluation and Assessments

Assessment Type: On-Campus (face-to-face)

Assessment Type	% of Total Grade
Lab Assignments	30%
Lab Exam	10%
Weather (Lab) Journal	10%
Midterms	20%
Final Exam	30%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

Pass requirements: A passing average (50% or higher) in both the theory and practical components.

Evaluation Notes: A grade of “D” grants credit, but may not be sufficient as a prerequisite for sequential courses.

Exam Attendance:

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a “0” on the exam.

Academic Policies:

College of the Rockies policies related to courses can be found at https://cotr.bc.ca/about-us/college-policies/ and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.5.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

Course Changes:

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.