GEOG-230 – Meteorology, Climatology and Hydrology

University Arts and Science

Effective Term & Year: Fall 2025
Course Outline Review Date: 2030-04-01

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, students 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: Sciences, Lab 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)

Prior Learning and Recognition: Yes

Students are able to request formal recognition of their prior learning or experience outside the classroom. Challenge examination, portfolio-assisted assessment, work-based assessment or a combination of assessments that is appropriate to identify, assess, and recognize prior skills, competencies, and knowledge to achieve course credit. Tuition fees apply, refer to Policy 2.5.5 Prior Learning Assessment and Recognition (PLAR) or 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;
- outline respective ways to visit and learn from the homelands and waterways in Ktunaxa ?amak?is, the traditional territory of the Ktunaxa Nation;
- 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 and solutions for climate mitigation, adaption, and impact reduction (SDG Goal 13: Climate Action);
- demonstrate competence in methods to gather climate data, including use of basic meteorological and hydrological instrumentation
- execute scientific research and data analysis including: the construction and reading of graphs; investigation of spreadsheets, and selection of online weather products;

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. Indigenous worldview related to climate and water
11. Global climates
12. 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 2.1.4 Course Audit
- Policy 2.4.1 Credential Framework
- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Rights, Responsibilities and Conduct
- Policy 2.4.8 Academic Performance
- Policy 2.4.9 Student Feedback and Concerns
- Policy 2.4.11 Storage of Academic Works
- Policy 2.5.3 Student Appeal
- Policy 2.5.5 Prior Learning Assessment and Recognition (PLAR)

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.