

University of Alaska Anchorage
School of Education
3211 Providence Drive
Anchorage, Alaska 99508-8269

ED 581
Professional Learning in Science Education:
Denali's Alpine Wildlife

1 Credit, Graded P/NP

Summer 2024

Course Sponsor: Alaska Geographic, Murie Science and Learning Center, Denali National Park

Instructor: Dr. Carol McIntyre

Educational Resource: Paula Davis

Primary Grading Instructor: Madeleine Morimoto

Facilitating Instructor: Jessica Brillhart

Contact Information Address: Alaska Geographic, Murie Science and Learning Center
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Course Meeting Information

Location: Murie Science and Learning Center, Denali National Park & Preserve entrance

Start and End Date: July 19 – 21, 2024

Class Day(s) & Time(s): July 19th 6:30pm through July 21th, 4pm, continuous residential course

Final Project Due: Final day of course

Course Description: Alaska is changing rapidly due to a warming climate and organisms that live in Denali's alpine areas are experiencing conditions that they haven't encountered before. National Park Service wildlife biologist Carol McIntyre will lead daily hikes into Denali's alpine ecosystem, home to Dall sheep, collared pikas and more. Participants will learn about the many ways that scientists are studying how alpine species and ecosystems are responding to a rapidly warming climate. In the evening, the class will talk about daily observations and learn more about the cascading effects of climate change. Participants will consider how to integrate their learning from this fieldwork course into their teaching or educational environments.

Intended Audience: Teachers and other interested educators

Enrollment Restrictions: None

Course Prerequisite/Co-requisites: None

Course Design:

- a. Requires 15 contact hours and approximately 30 hours of engaged learning.
- b. Does not apply to any UAA certificate or degree program.
- c. No UAA lab and/or materials fees beyond standard charges.
- d. This Murie Science and Learning Center course will be entirely field-based. Learning will be achieved through lectures, group discussions, field observations, and field activities. This course is based upon the collegial sharing, collaboration, and support of the participants and facilitator as a community of learners. Course activities will include common readings and group discussions, collective learning processes, peer coaching/mentoring, and reflective practices.

Instructional Goals and Defined Outcomes:

RESEARCH BASED THEORY/PRINCIPLES/PRACTICES/TRENDS (CONTENT)

1.0 Instructional Goal:

Introduce participants to some of the many scientific methods used by researchers to document the presence, abundance, and distribution of alpine wildlife and studying what mechanisms drive changes in those metrics.

Defined Outcome:

Participants will learn about several quantitative methods used by scientists to document presence, estimate abundance, and describe distribution of alpine wildlife. This includes occupancy modeling, repeated sampling, and mark-recapture methods. Participants will learn about how scientists identify what mechanisms such as weather events and changes in habitat drive trends in these metrics over time.

2.0 Instructional Goal:

Provide opportunities for observing wildlife in their native habitats and examining their behavior.

Defined Outcome:

Participants will travel to specific habitats to make observations of several species of wildlife including Dall sheep, Collared Pika and Arctic Ground Squirrels.

3.0 Instructional Goal:

Introduce participants to results of studies focused on the response of alpine wildlife to a changing climate.

Defined Outcome:

Participants will come away with a better understanding of the ecology of alpine ecosystems and the fauna that live in these ecosystems, including how these areas and their inhabitants are or maybe responding to the cascading effects of a warming climate.

THEORY INTO PRACTICE (APPLICATION)

4.0 Instructional Goal:

Provide participants with a variety of methods for teaching their students about the various research techniques used by scientists to study alpine wildlife.

Defined Outcome:

Participants will describe how they will integrate their experiences into their teaching or educational environments.

REFLECTION ON THEORY INTO PRACTICE (REFLECTION)

5.0 Instructional Goal:

Engage participants in discussions, reflective journaling and informal sharing about science instruction and how to incorporate gained knowledge and experience into their classrooms.

Defined Outcome:

Participants will review and reflect upon the scientific information covered. Participants will complete a journal, reflecting on how the information can be shared with their students.

RELATIONSHIP TO STANDARDS

6.0 Instructional Goal:

Familiarize participants with science content standards addressed by the strategies and concepts presented.

Defined Outcome:

Participants will identify the Science-Content standards applicable to their classroom.

Writing Style Requirements:

Participants' writing will reflect the clarity, conciseness, and creativity expected of post-baccalaureate certificated educators.

Attendance and Make-up Policy:

Participants are expected to actively and collegially participate in all classes as a contributing member of a learning community. Attendance at every session is mandatory.

Course Assignments, Assessment of Learning, and Grading System:

Course grading will be Pass/No Pass based upon the following:

- a. Participation 50%
Participants will be expected to actively and collegially participate in discussions, activities, and other process experiences during the seminar.
- b. Final Project - Journal completion 50%
Participants will complete journal assignments to be turned in to MSLC field guide on the last day of class. Assignments will include thoughtful reflection based upon seminar experience and an application plan of how participants will integrate issues and content discussed into their own classroom setting.

Quality of Work

Grade of "Pass"

Passing work includes all components of the assignment and meets proficient criteria. It is focused, developed, supported, logical, and acceptable work with minimal errors. Work of this quality indicates understanding of key concepts and knowledge base.

Grade of "No Pass"

Work graded "No Pass" may lack key criteria/components of the task and show little or no evidence of conceptual understanding or knowledge utilization. Work may also show minimal or no organization/development and/or clear focus (may be difficult to

follow) and may contain numerous errors. This grade indicates minimal or no knowledge or concept development. It may also mean that work was not attempted.

Course Calendar/Schedule:

Friday	6:00 p.m. – 6:30 p.m.	Greeting and check in at MSLC
	6:30 p.m. – 7:30 p.m.	Introduction, orientation & overview <ul style="list-style-type: none">Participants will learn more about each other and expectations for this course.
	7:30 p.m. – 9:00 p.m.	Drive to MSLC Field Camp and settle in
Saturday	9:00 a.m. – 5:00 p.m.	Exploration of Denali <ul style="list-style-type: none">Travel to alpine areas to observe wildlife and study their behavior.Discuss various methods used by scientists to study alpine wildlife.Discuss the importance of understanding how alpine wildlife is responding to a rapidly warming climate.
	6:00 p.m. – 8:00 p.m.	Dinner and evening discussions <ul style="list-style-type: none">After dinner discussions will focus on highlighting what we observed and learned during the day.Teacher study group to discuss the day's activities and how the information can be shared with studentsIdentify applicable science content standards addressed by course content
Sunday	9:00 a.m. – 3:00 p.m.	Continued exploration of Denali <ul style="list-style-type: none">Continued study of alpine wildlife and topics introduced on the prior day, with a quick wrap up at end of seminar.
	3:00 p.m. – 4:00 p.m.	Return drive to MSLC

Final Project Due: last day of course

Course Texts, Readings, Handouts, and Library Reserve:

Required Text/Materials:

Chmura, H.E., Duncan, C., Saer, B. et al. *Hypothalamic remodeling of thyroid hormone signaling during hibernation in the arctic ground squirrel*. *Commun Biol* 5, 492 (2022). Retrieved from: <https://www.nature.com/articles/s42003-022-03431-8>

Berteaux, D., Gauthier, G., Domine, F., Ims, R. A., Lamoureux, S. F., Lévesque, E., & Yoccoz, N. (2017). *Effects of changing permafrost and snow conditions on Tundra Wildlife: Critical Places and times*. *Arctic Science*, 3(2), 65–90. Retrieved from: <https://cdnsiencepub.com/doi/full/10.1139/as-2016-0023>

Supplemental information can be found in the following sources:

Content References:

Alaska Department of Fish and Game. *Arctic Ground Squirrel*. Retrieved from:
<http://www.adfg.alaska.gov/index.cfm?adfg=arcticgroundsquirrel.printerfriendly>

Alaska Department of Fish and Game. *Collared Pika*. Retrieved from:
<http://www.adfg.alaska.gov/index.cfm?adfg=collaredpika.printerfriendly>

Alaska Department of Fish and Game. *Dall Sheep*. Retrieved from:
<https://www.adfg.alaska.gov/index.cfm%3Fadfg%3Ddallsheep.main>

IPCC (Intergovernmental Panel on Climate Change). (2021). *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Retrieved from:
https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SummaryVolume.pdf

MacCluskie, M.C. and P. J. Sousanes. (2023). *High-latitude National Parks on the cusp of change*. Alaska Park Science. Retrieved from: <https://www.nps.gov/articles/000/aps-22-1-0.htm>

Mellard, J.P., J-A. Henden, A.O. Pedersen, F. Marolla, S. Hamel, N.G. Yoccoz, and R.A. Ims. (2022). *Food web approaches for managing Arctic wildlife populations in an era of rapid environmental change*. *Climate Research* 86: 163-178. Retrieved from:
https://www.int-res.com/articles/cr_oa/c086p163.pdf

National Park Service. (2023) *Series: Reckoning with a Warming Climate*. Alaska Park Science. Retrieved from: <https://www.nps.gov/articles/series.htm?id=30369C98-990C-EA2F-62432CED5C938737>

Standards References:

Alaska Comprehensive Center. (2012). *Guide to Implementing the Alaska Cultural Standards for Educators*. Juneau, AK: Alaska Department of Education and Early Development. Retrieved from: <https://education.alaska.gov/standards/cultural> and <https://www.asdn.org/wp-content/uploads/Implementing-AK-cultural-standards-1.pdf>

Alaska Native Knowledge Network. (1998). *Alaska standards for culturally responsive schools*. Fairbanks, AK: University of Alaska Press. Retrieved from:
<http://www.ankn.uaf.edu/publications/culturalstandards.pdf>

National Research Council, the National Science Teachers Association, the American Association for the Advancement of Science, and Achieve. (2013). *The next generation science standards*. Retrieved from <http://www.nextgenscience.org/next-generation-science-standards>.

State of Alaska Department of Education and Early Development. (2019). *Content and performance standards for Alaska students*. Juneau, AK: Author. Retrieved from:
https://education.alaska.gov/akstandards/standards/Content_and_Performance_Standards_edited.pdf

State of Alaska Department of Education and Early Development. (2019). *K-12 Science Standards for Alaska*. Juneau, AK. Author. Retrieved from:
<https://education.alaska.gov/akstandards/science/science-standards-for-alaska.pdf?v=1>

State of Alaska Department of Education and Early Development. (2012). *Alaska English/Language Arts and Math Standards*. Juneau, AK: Author. Retrieved from:
https://education.alaska.gov/akstandards/standards/ELA_and_Math.pdf

Informed by the School of Education Vision, Mission, and Conceptual Framework:

We believe that the preparation and support of professional educators is the shared responsibility of the University of Alaska Anchorage and our partners, and that our programs must evolve dynamically in response to unique community needs, research, and continuous program assessment. This PACE course is designed to meet a professional development need in response to our partner school districts and professional organizations. The course fits within the mission of the UAA School of Education as we encourage lifelong learning to meet the challenges of a rapidly changing world.

Link to Alaska Educator Content and Performance Standards:

This professional development is rooted in the fundamentals of Alaska’s standards for teachers, administrators, and beginning teachers in Alaska’s Administrative Code, 4 AAC 04.200. It is offered to encourage and support practicing educators attain, maintain, or surpass the standards for effectively preparing today’s students for successful lives and productive careers.
<https://education.alaska.gov/standards/other-standards>

Learning Forward Standards for Professional Learning:

This course is further informed by the Learning Forward Standards for Professional Learning which outline the “characteristics of professional learning that leads to effective teaching practices, supportive leadership, and improved student results.” As explicit in the standards, “professional learning is for educators to develop the knowledge, skills, practices and dispositions they need to help student perform at a higher levels.”
<https://standards.learningforward.org>

Course Policies:

Incomplete Grades

Due to the nature of this course, grades of incomplete will not be permitted.

ADA Policy

The provision of equal opportunities for students who experience disabilities is a campus-wide responsibility and commitment. Disabilities Support Services (DSS) is the designated UAA department responsible for coordinating academic support services for students who experience disabilities. To access support services, students must contact DSS (786-4530 or 786-4536 TTY) and provide current disability documentation that supports the requested services. Disability support services are mandated by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990. Additional information may be accessed at the DSS Office in RH 105 or on-line at www.uaa.alaska.edu/dss.

Academic Dishonesty Policy

Academic integrity is a basic principle that requires all students to take credit only for the ideas and efforts that are their own. Cheating, plagiarism, and other forms of academic dishonesty are defined as the submission of materials in assignments, exams, or other academic work that is based on sources prohibited by the faculty member. Academic dishonesty is defined further in the “student Code of Conduct.” In addition to any adverse academic action that may result from the academically dishonest behavior, the University specifically reserves the right to

address and sanction the conduct involved through student judicial review procedures and the Academic Dispute Resolution Procedure specified in the University catalog.

Professional and Ethical Behavior

University of Alaska Anchorage School of Education students are expected to abide by the State of Alaska Code of Ethics of the Education Profession and professional teaching standards as they concern students, the public, and the profession. The standards, adopted by the Professional Teaching Practices Commission, govern all members of the teaching profession. A violation of the code of ethics and professional teaching standards are grounds for revocation or suspension of teaching certification.

Technology Integration

University of Alaska Anchorage School of Education students are expected to (a) demonstrate sound understanding of technology operations and concepts; (b) plan and design effective learning environments and experiences supported by technology; (c) implement curriculum plans that include technology applications in methods and strategies to maximize student learning; (d) facilitate a variety of effective assessment and evaluation strategies; (e) use technology to enhance productivity and professional practice; and (f) understand the social, ethical, and human issues surrounding use of technology in PreK-12 schools and apply those principles in practice.

Course Safety and Risk

This course is sponsored by Alaska Geographic and the Murie Science and Learning Center. The University of Alaska Anchorage provides the credit option for interested participants. This course takes place entirely outdoors and within a remote area of Alaska. Field courses, such as this, do have inherent risks. These risks will be outlined in the Alaska Geographic Acknowledgement of Risk form and by the course instructors. Acknowledgement of Risk form will be provided at the time of registration and a signed copy is required in order to attend.

Non-Discrimination Policy

The University of Alaska is an affirmative action/equal opportunity employer and educational institution. The University of Alaska does not discriminate on the basis of race, religion, color, national origin, citizenship, age, sex, physical or mental disability, status as a protected veteran, marital status, changes in marital status, pregnancy, childbirth or related medical conditions, parenthood, sexual orientation, gender identity, political affiliation or belief, genetic information, or other legally protected status. The University's commitment to nondiscrimination, including against sex discrimination, applies to students, employees, and applicants for admission and employment. Contact information, applicable laws, and complaint procedures are included on UA's statement of nondiscrimination available at www.alaska.edu/nondiscrimination.