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

ED 581
Professional Learning in Science Education:
Geology of Denali

1 Credit, Graded P/NP

Summer 2024

Course Sponsor:	Alaska Geographic, Murie Science and Learning Center, Denali National Park
Instructor:	Sean Regan
Educational Resource:	Paula Davis
Primary Grading Instructor:	Madeleine Morimoto
Facilitating Instructor:	Jessica Brillhart
Contact Information	
Address:	Alaska Geographic, Murie Science and Learning Center P.O. Box 136, Denali Park, AK 99755
Telephone:	(907) 683-9632
Email address:	courses@akgeo.org
Course Meeting Information	
Location:	Murie Science and Learning Center (MSLC), Denali National Park & Preserve entrance
Start and End Date:	August 2 – 4, 2024
Class Day(s) & Time(s):	August 2nd, 6:30pm through August 4th, 4pm, continuous residential course
Final Project Due:	final day of course
Course Description:	Denali's dramatic landscape has been sculpted and scoured by tectonics, glaciers, rivers, and landslides. Participants will join University of Alaska Fairbanks Geology professor and researcher Sean Regan for an introduction to Denali's geology. Course will spend time hiking mountains and valleys learning how geologists study the Earth and interpret the landscape's story. Activities will include basic mineral and rock identification, deciphering evidence of past glaciations, examining dynamic braided rivers, and visiting areas affected by permafrost and landslides. Participants will consider ways to integrate their experience into their teaching or educational environment.
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:
The instructor will introduce participants to the geologic story of Denali National Park and provide them with the basic knowledge and abilities to interpret geology in the park and beyond.

Defined Outcomes:
2.1 Participants will demonstrate an understanding of the geologic story of Denali.
2.2 Participants will demonstrate an understanding of geologic processes.
2.3 Participants will know basic geologic terminology.

THEORY INTO PRACTICE (APPLICATION)

2.0 Instructional Goal:
The instructor will teach participants skills for interpreting the geologic story of Denali National Park including specifics about mineral resources, permafrost, glacier extents, fossils, and many other dynamic processes. Some of these skills include: (1) identifying common minerals, basic rock types, and geologic formations that are significant in Denali; (2) identifying landforms created by various geologic processes; (3) identifying causes and triggers of earthquakes and landslides; and (4) understanding how glaciers and permafrost are changing and how this will further impact the landscape.

Defined Outcomes:
2.1 Participants will identify basic minerals, rock types and formations in Denali.
2.2 Participants will identify landforms created by various geologic processes
2.3 Participants will identify the causes and triggers of earthquakes and landslides
2.4 Participants will demonstrate an understanding of how glaciers and permafrost are changing and how this will further impact the landscape.
2.5 Participants will discuss how they will integrate these lessons into their teaching or educational environments.

REFLECTION ON THEORY INTO PRACTICE (REFLECTION)

3.0 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 (STANDARDS)

4.0 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, but are not limited to, 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. – 8:00 p.m. Introduction, orientation & overview
- Introduction of all participants and staff
- Overview of park geology and course expectations

8:00 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 geology

- Drive and hike along the Denali Park Road corridor to explore park geology
- Discuss and implement basic mineral, rock, and geologic formation identification
- Discuss various landforms, their genesis, and how they may change through time
- Inspect numerous landslides; discuss fundamentals of landslide and how they may change through time
- Inspect areas where permafrost is changing and discuss that change

6:00 p.m. – 8:00 p.m. Dinner and evening discussions

- An encapsulation of important concepts from the day
- Time for lingering questions
- Time to review maps and documents
- Teacher study group to discuss the day's activities and how the information can be shared with students
- Identify applicable science content standards addressed by course content

Sunday 9:00 a.m. – 4:00 p.m. Continued exploration of Denali

- More driving and hiking along the park road corridor to explore geology
- Continue explorations and discussion of topics from the previous day
- An encapsulation of important concepts from the day
- Time for lingering questions

4:00 p.m. Return to park entrance

Final Project Due: final day of course

Course Texts, Readings, Handouts, and Library Reserve:

Recommended Text/Materials:

Capps, D., McLane, S., and Chang, L., 2020. *Denali National Park and Preserve Geology Road Guide*. National Park Service, Denali National Park and Preserve, Denali Park, Alaska. Retrieved from: https://irma.nps.gov/DataStore/Reference/Profile/2244417

National Park Service. (n.d.) *Geology.* Retrieved from: https://www.nps.gov/dena/learn/nature/denali.htm

National Park Service (n.d.) *Pretty Rocks Landslide.* Retrieved from: https://www.nps.gov/dena/learn/nature/pretty-rocks.htm

National Park Service. *Glacier monitoring in Denali.* Retrieved from: https://www.nps.gov/articles/denali-glacier-monitoring.htm

National Park Service. *Monitoring climate change in Denali.* Retrieved from: https://www.nps.gov/articles/denali-monitoring-climate-change.htm

National Park Service. *Permafrost landscapes*. Retrieved from: https://www.nps.gov/articles/denali-permafrost-landscapes.htm

Supplemental information can be found in the following sources:

Davis, N., 2001. *Permafrost: A guide to frozen ground.* University of Alaska Press. 351 p.

Harris, A., Tuttle, E., 2003. *Geology of national parks.* Dubuque, IA: Kendall/Hunt Publishing Company. Pp. 478-504.

National Park Service. *Denali National Park and Preserve Geologic Resources Inventory Report.* 2010. Natural Resource Report NPS/NRPC/GRD/NRR—2010/244. Denver, CO. Retrieved from: https://irma.nps.gov/DataStore/DownloadFile/564728

Other Denali Science Summaries found at: https://www.nps.gov/dena/learn/nature/science-summaries.htm

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.