
1. Course information

Title: Special Topic, Arctic Alaska Environmental Change: Field excursion to the North Slope
Number: BIOL 495 / 695
Credits: 3
Prerequisites: BIOL 115x & 116x, or equivalent introductory physical science course intended for science majors in biology, geology or geography and instructor approval
Location: Murie, Room 230
Meeting time: 1 Jun, 9:00 am

2. Instructors and contact information

Prof. D.A. (Skip) Walker, (instructor and course leader) Alaska Geobotany Center, University of Alaska Fairbanks, Arctic Health Building, Room 254, X 2460, dawalker@alaska.edu. Martha Raynolds (instructor and course manager) mkraynolds@alaska.edu, Amy Breen (instructor with Wilderness First Responder training), albreen@alaska.edu.

3. Course readings/Material:

Readings (see daily readings in the course schedule):

Daily readings: Each day 1-2 papers are required readings that we will discuss over breakfast and/or dinner. The required readings are in the “Syllabus and Course Reader” and in the book Arctic Voices: Resistance at the Tipping Point by Subhankar Banerjee. Copies of both are in the provided materials.

Course library: The course also carries a book box with many other general references, relevant papers and books. Students can check these out for personal reading and as background for their course projects. The contents of the library are listed in the course “Syllabus and readings”.

Good general references: These references provide a good overview of the Dalton Highway and research at the Toolik Field Station.

Course equipment
The course will provide a large group meeting and eating tent, Coleman stoves, water purification, first aid kit, satellite phone, generator, and vehicles. Students will need to purchase food and have money for meals at Coldfoot and Prudhoe Bay. Students will need to enroll early and contact the organizers to get a list of required equipment including: tent, sleeping bag, sleeping pad, rain gear, footwear, sun protection, bug protection, personal gear and other camping equipment. For students traveling from abroad or that do not own extreme weather gear, tents, sleeping bags and sleeping pads are available from the course instructors or can be rented from UAF’s Outdoor Adventures.

4. Course description:
Course catalog description:
BIOL F495_ Arctic Alaska Environmental Change: Field excursion to the North Slope. 3 Credits. Offered Summer 2016
15-day course, Includes 11-day field excursion along the Dalton Highway, Brooks Range, Arctic Foothills Arctic Coastal Plain, Prudhoe Bay. Topics include climate, geology, permafrost, soils, vegetation, wildlife, local people, and infrastructure impacts. Special fees apply. Stacked with BIOL F695.

More detailed description: This course will consist of:
1. 2 days of preparation with lectures, local field trips in the Fairbanks area and logistics for the excursion.
2. 11 day field excursion
3. 2 days of student presentations and local field trip at the end.
The trip will have a strong emphasis on Arctic environments, local people, and field sampling.

5. Course goals and student learning outcomes
The goals for the course are to: (1) Provide students with an in-depth field experience of Arctic environments, local people, and the oil industry’s environmental research program and application to current Arctic issues. (2) Provide methods of field sampling of Arctic vegetation, soils, and permafrost in a variety of Arctic ecosystems. (3) Visit Arctic research sites, including Finger Mountain, Atigun Pass, Toolik Lake, Imnavait Creek, Happy Valley, Sagwon, and Prudhoe Bay.
6. Instructional method and grading criteria:

2-day preparation in Fairbanks
Introductory lectures will give an overview of the course and Arctic ecosystems, permafrost and local people along the Dalton Highway. Students will develop a research topic to be examined during the excursion. On the third day students will visit local boreal forest ecosystems and the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) Permafrost Tunnel at Fox. Students should become familiar with the field guides (Walker et al. 2009, Brown & Krieg 1983, Huryn & Hobbie 2013) for the Dalton Highway route.

11-day field excursion:
The course will follow the route of the Dalton Highway. The course will examine Arctic environments, with in-depth examination of the physical, biological, and human responses and adaptations to changing climate. We visit the old mining town of Wiseman to gain an understanding of village. We will establish camps in the Boreal Forest, Brooks Range, Arctic Foothills, and Arctic Coastal Plain — Coldfoot, Galbraith Lake, Happy Valley, and near Deadhorse — where we will camp and spend two days at each location exploring the local vegetation, soils, permafrost, geology, and land-use and climate-change issues. The course will have field lectures, conducted during hikes to different areas, using materials from past and existing research projects in the region. Students will learn the methods of vegetation, soil, and permafrost sampling and collect sample data from representative ecosystems. The course includes visits to the Arctic Research Station at Toolik Lake and the oilfield at Prudhoe with an overview of the environmental research of the oil companies at Prudhoe Bay. We will then return to UAF driving south from Prudhoe Bay to Fairbanks.

2-day presentation of student projects:
At the end of the course students will spend one day writing an oral presentation that summarizes their observations during the excursion. Students will present their findings on the second day with ample time for group discussions.

Research topics:
Students will develop a research topic that fits with the planned excursion. The topics should focus on descriptive aspects of Arctic environment along the climate gradient. Students should keep in mind that the analysis of the data will be limited by the short time available at the end of the course. At the end of the course, students will present 15-minute oral presentations summarizing aspects of their field observations, focusing on their research topic. Guidelines for these presentations will be handed out at the beginning of the course. Graduate students will also write a 10 page research paper focused on some aspect of observations during the course, which will be due 20 June 2016.
### 7. Course Schedule and reading assignments:

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<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Activity</th>
<th>Reading to be done in preparation for each day</th>
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<tbody>
<tr>
<td>31 May</td>
<td>Fairbanks, Hess commons</td>
<td>Arrival, check into dorm</td>
<td>None</td>
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<tr>
<td>1-Jun</td>
<td>Fairbanks, Margaret Murie Bldg.</td>
<td>9:00 am: Cold breakfast. Introductions. Talks: Overview of course, discussion of student projects. 12:00 noon: Lunch 1:00 pm: (outside Irving Bldg.), Health &amp; safety, equipment check. 6:00 pm: (College Pizzaria), dinner. Night: UAF Dorms or elsewhere in Fbks.</td>
<td>McPhee, J., &quot;Coming into the Country&quot;, pp. 349-362 in <em>Arctic Voices</em>.</td>
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<tr>
<td>3-Jun</td>
<td>Meet at Fairbanks Arctic Health Bldg. West Parking Lot</td>
<td>Breakfast: Sourdough Sam’s 6:30 am: Arctic Health West Parking Lot: Final packing, drive to Sourdough Sams for breakfast. 8:00 am -12:00 noon: Drive to Yukon river. 12:00 noon: Lunch at Yukon River. 1:00 4:00 pm: Drive to Coldfoot with stop at Finger Mtn Dinner: at Coldfoot truck stop. Night: Tent camp in Coldfoot vicinity</td>
<td>O’Neil, D., &quot;The Fall of the Yukon Kings&quot; pp 142-164 in <em>Arctic Voices</em></td>
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<tr>
<td>Date</td>
<td>Location</td>
<td>Breakfast</td>
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<tr>
<td>Date</td>
<td>Location</td>
<td>Activities</td>
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<td>14-Jun</td>
<td>Fairbanks</td>
<td>Breakfast: on own. 8:00 am: Unload vehicles. Rest of day: Final presentations preparation. Dinner: On own Night: Dorms in Fairbanks.</td>
<td>Papers relevant to presentations</td>
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</table>
**15-Jun**
Fairbanks

**Breakfast:** Room.
**8:00 am:** Unload vehicles.
**Rest of day:** Final presentations.
**Dinner:** Celebration
**Night:** Dorms in Fairbanks.

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**16-Jun**
Depart

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### 8. Academic Policies:

**Academic integrity:**
Plagiarism and cheating will not be tolerated. Plagiarism is presenting another’s work as new or original without citing your source. For additional detail, see http://www.uaf.edu/library/instruction/handouts/Plagiarism.html
Please speak with me if you have any questions about how to properly use other people’s work.

**Attendance policy:**
Students are expected to actively participate in both the academic part and expedition part of camp, cooking, clean-up, waste management, emergencies, group decisions, and keeping a cheerful attitude in sometimes difficult field conditions such as rain, cold or snow.

### 9. Evaluation:

**Summary of grading points:**

*Undergraduate student grading (BIOL 495 students):*
- Attendance and participation lectures, field trips, and discussions: 200 pts
- Field notebooks and plant collections: 200
- Oral presentation of research topic: 200
- TOTAL: 600 pts
Graduate student grading (BIOL 695 students):

<table>
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<tr>
<th>Criterion</th>
<th>Points</th>
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<tr>
<td>Attendance and participation in discussions</td>
<td>200</td>
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<tr>
<td>Field notebooks and plant collections</td>
<td>200</td>
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<tr>
<td>Oral presentation of research topic</td>
<td>200</td>
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<tr>
<td>Final research paper</td>
<td>200</td>
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<tr>
<td>TOTAL</td>
<td>800</td>
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These criteria may be modified somewhat as the course progresses.
Final grades will be as follows: greater than or equal to 90% = A; 80-89% = B; 70-79% = C; 60-69% = D; < 60% = F.

Graduate student grading:
Graduate students will be graded according to the same criteria as the undergraduate students except that the graduate students are required to turn in a 10 page research paper on a topic of their choice. Guidelines for this paper will be handed out on the first day of class. Due date is 20 June 2016. Students should arrange for an incomplete grade if they cannot meet this deadline.

10. Support Services:
Students are encouraged to contact the instructor with any questions, or to clarify the lecture or the assignments. I will be happy to review drafts of assignments and answer questions any time. Office: Arctic Health, Room 254. Phone 474-2460, dawalker@alaska.edu. Home phone: 451-0800.

11. Disabilities services:
The instructor will work with the Office of Disabilities Services (203 WHIT, 474 7043, to provide reasonable accommodation to students with disabilities.
Course Library (2016)

Items not in manila folders

Books, data reports, natural history guidebooks, guides to the Dalton Highway and floras


**Items in manila folders (arranged alphabetically by author within subject folders)**

**Journal articles and book chapters**

**ANIMALS**

CLIMATE CHANGE

GEOLOGY

HUMAN, INDUSTRIAL & SOCIAL SYSTEMS
Klein, David R. 2002. Perspectives on wilderness in the Arctic. Wilderness in the circumpolar north: searching for compatibility in ecological, traditional, and ecotourism values. USDA, Ogden UT.

PLANTS
Kade A., Walker D. A. 2008. Experimental alteration of vegetation on nonsorted circles: effects on cryogenic activity and implications for climate change in the Arctic. Arctic,
Antarctic, and Alpine Research 40: 96-103.

SOILS AND PERMAFROST