Syllabus for UAF Summer Sessions Special Topic course,
BIOL 495/695, Arctic Alaska Environmental Change: Field excursion to the North Slope, 6-21 Jun 2014

1. Course information
   Title: Special Topic, Arctic Alaska Environmental Change: Field excursion to the North Slope

   Number: BIOL 495 / 695
   Credits: 4
   Prerequisites: BIOL 115 & 116, or equivalent introductory physical science course intended for science majors in biology, geology or geography or instructor approval
   Location: TBA
   Meeting time: TBA

2. Instructor and contact information
   Prof. D.A. (Skip) Walker, Alaska Geobotany Center, University of Alaska Fairbanks, Arctic Health Building, Room 254, X 2460, dawalker@alaska.edu. Office hours: Generally available, call before coming.

3. Course readings/Material:
   Readings: Numerous papers will be read and are in the assignments listed in the course calendar and will be posted on line at http://www.geobotany.uaf.edu. These three references provide a good overview of the Dalton Highway:

   Required materials:
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.

4. Course description:
   Course catalog description:
   BIOL F495_ Arctic Alaska Environmental Change: Field excursion to the North Slope. 4 Credits. Offered Summer 2014
   15-day course, Includes 10-day field excursion along the Dalton Highway, Brooks Range, Arctic Foothills Arctic Coastal Plain, Prudhoe Bay. Climate, geology, permafrost, soils, vegetation, local...
people, effects of oil development. Special fees apply. Stacked with BIOL F695(4)

More detailed description: This course will consist of:
1. 3 days of preparation with lectures, local field trips in the Fairbanks area and logistics for the excursion.
2. 10-day excursion
3. 2 days of student presentations at the end.

This course is based on the guidebook and field trip conducted during the Ninth International Conference on Permafrost, and the 2010 IARC Summer Field School. 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 wetland rehabilitation 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, Innnavait Creek, Happy Valley, Sagwon, Franklin Bluffs and Prudhoe Bay.

6. Instructional method and grading criteria:
3-day preparation in Fairbanks
Introductory lectures will give an overview of the course and ecosystems, climates, permafrost and local people along the Dalton Highway. Students will develop a research topic to be examined during the excursion. They will also prepare for the excursion by buying food, needed supplies and personal gear. 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 and Krieg 1983) for the Dalton Highway route.

10-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 will establish camps in the Brooks Range, Arctic Foothills, and Arctic Coastal Plain — at 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 most mornings, using materials from past and existing research projects in the region. In the afternoons students will learn the methods of vegetation, soil, and permafrost sampling and collect sample data from representative ecosystems. The course includes a portion at Prudhoe Bay with an overview of the oilfield and instruction in wetland rehabilitation efforts. 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 10-15 page research paper focused on some aspect of observations during the course, which will be due at end of the summer.

**7. Course Schedule and assignments:**

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<th>Day</th>
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<th>Topic</th>
<th>Assignment:</th>
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| 1   | Jun 6| Morning: Arctic Environment overview lectures  
Permafrost: Yuri Shur  
Vegetation and soils: Skip Walker  
Human Environment: Gary Kofinas  
Afternoon: Development of student research topics                                                                 | Suggested reading two of the following during the course:  
Fairbanks, AK: Division of Geological and Geophysical Surveys.  
| 2   | Jun 7| Morning: Continuation of overview lectures  
Afternoon: Preparation for field excursion.                                                                                                                                                         |                                                                                                                                                                                                             |
| 3   | Jun 8| Field excursions to local boreal forest ecosystems to sample permafrost and visit the CRREL Permafrost Tunnel                                                                                         | Kanevskiy, M., French, H., Shur, Y., Bjella, K., Bray, M., Collins, C., Douglas, T., Fortier, D. 2008. Late-Pleistocene Syngenetic Permafrost in the CRREL Permafrost Tunnel, Fox, Alaska.  
Guidebook prepared for the Ninth International Conference on Permafrost. UAF, Institute of Northern Engineering. |
| 4   | Jun 9| Drive to Coldfoot with stops at Tolovana River (permafrost sampling)  
Yukon River, Finger Mountain, U.S. Forest Service Fire Ecology research site at Mile 85.7 and Arctic Circle. Evening lecture at Coldfoot Multi-agency Visitor Center.  
Camp at Marion Creek.                                                                                                                   | Ellis JM, Calkin PE. 1979. Nature and distribution of glaciers, neoglacial moraines, and rock glaciers, |
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<tr>
<td>11</td>
<td>Jun 16</td>
<td>Morning: Drive to Franklin Bluffs, Visit research sites. Afternoon: Coastal Plain environments sampling. Camp at Sagwon.</td>
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<td>13</td>
<td>Jun 18</td>
<td>Prudhoe Bay oil field tour and overview of the wetland rehabilitation program. Camp at Sagwon</td>
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<td>Jun 14</td>
<td>Return to Fairbanks, stopping where necessary for student projects.</td>
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<td>Jun 15</td>
<td>Students prepare oral presentations summarizing field observations</td>
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<td>Jun 16</td>
<td>Student oral presentations</td>
<td>Graduate student papers due 30 Jun.</td>
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8. Course 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](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: 200
- Oral presentation of research topic: 200
- TOTAL: 600 pts

**Graduate student grading (BIOL 695 students):**
- Attendance and participation in discussions: 200 pts
- Field notebooks: 200
- Oral presentation of research topic: 200
- Final research paper: 200
- TOTAL: 800 pts

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 3-5 page research paper on an Arctic Vegetation topic of their choice. Guidelines for this paper will be handed out
on the first day of class. Due date is 21 Jun. 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. 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.