Preliminary Syllabus for SEMINAR,
BIOL 492 / 692, Arctic Vegetation Ecology: Lecture, Spring 2012

1. Course information
Title: Special Topic, Arctic Vegetation Ecology: Lecture
Number: BIOL 492 / 692
Credits: 3
Prerequisites: BIOL 115 & 116, Introduction to Plant Biology (BIOL 239) or Principles of Ecology (BIOL 271) or instructor approval
Location: 201 Irving I
Meeting time: T/Th, 2:00 pm – 3:30 pm

2. Instructor
Prof. D.A. (Skip) Walker, Alaska Geobotany Center, University of Alaska Fairbanks, AHRB, Room 254, 474-2460, dawalker@alaska.edu. Office hours: Generally available, call before coming.

3. Course readings/Material
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/teaching/biol492/. These three references provide a good overview of the Arctic Vegetation in North America and Russia and the current issues relevant to Arctic vegetation:

4. Course description
Course catalog description:
BIOL F492 / 692 Special Topic, Arctic Vegetation Ecology: Lecture
2 Credits Offered Spring 2012
Detailed study of Arctic plant communities including their composition, structure, paleo-history, biogeography, major environmental controls, applications of Arctic vegetation methods to current Arctic issues including climate change, wildlife management, and changing land-use in the Arctic. Special fees apply. Stacked with BIOL F692 (2 + 0.5 + 0.5)

More detailed description: This course consists of:
1. Lectures: This portion will examine the tundra plant communities and ecology of Arctic tundra. The emphasis will be on the factors controlling vegetation patterns, including climate, permafrost, geomorphology, soils, animals, zonation, paleogeography, biogeographic history, plant adaptations, and succession patterns.
2. Snow Ecology component: Two lectures plus a Saturday excursion to Eagle
Summit to examine the alpine system in winter conditions. The focus will be on
subnivian environments, and the effects of topography and snow distribution
patterns on plant habitat distribution.

3. **Literature discussion and student presentations:** Weekly discussion groups to
explore the key literature related to the lectures. Graduate students will lead these
sessions.

4. **Student oral presentations of research topics:** Oral presentations of in-depth
literature review on Arctic Vegetation topic of choice.

This course is part of a 3-course offering in vegetation science that includes (1) BIOL 492 / 692, Arctic Vegetation Ecology: Lecture, (2) BIOL 493 / 693, Arctic Vegetation Ecology: Excursion, and (3) BIOL 495 / 695, Vegetation Description and Analysis. The courses are designed to give students a thorough practical background and training in vegetation sampling and analytical methods adapted to northern ecosystems.

5. **Course goals and student learning outcomes:**
The goals for the course are to: (1) Provide students with an in-depth knowledge of
Arctic vegetation and application of vegetation science to current Arctic issues. (2) Provide a winter field trip to understand snow-vegetation interactions and snow-related phenomena. (3) Give students exposure to key Arctic vegetation literature and opportunity to actively discuss and debate this literature.

6. **Instructional method and evaluation criteria:**
**Lectures:**
This portion is a series of lectures that will examine the tundra plant communities and ecology of Arctic tundra. Generally, two lectures will address a topic, followed by a class period that will be devoted to literature that addresses the topic. The emphasis of the lectures will be on the factors controlling vegetation patterns, including climate, permafrost, geomorphology, soils, animals, zonation, paleogeography, biogeographic history, plant adaptations, and succession patterns. Students are expected to attend the lectures and read the assigned literature. There will be no tests over the lectures; 10 points will be awarded for attendance at each lecture.

**Literature discussion groups:**
During the first lecture, the class will be divided into two discussion groups that they will stay in for the rest of the semester. During the discussion session, each discussion group will present a summary of assigned papers, followed by a general discussion that will address a question comparing the two papers. The structure of these discussion sessions is as follows:

1. Each discussion session will be lead by a designated graduate student moderator who will be responsible for reading both papers, introducing the main speakers, asking for questions and input from the rest of the class, and keeping the discussion on time.

2. Each discussion group will have 20 minutes to present its paper of the day.
This will start with a 10-minute summary of the paper by 1-2 student(s) (depending on size of the class). These students will be assigned to make the presentation by the instructor early in the semester. These presentations can include slides of a few key figures from the paper as discussion points. These overviews should focus on the principal points of the paper and not so much on
methods. Other members of the group will then present other points that they feel are important. Each overview in total should take no more than 20 minutes. Both discussion groups in total should take 40 minutes to present the two papers, leaving 10 minutes at the end for an open discussion of both papers and how they might be related to each other. This will be followed by a 5-minute period for questions and comments from the whole class. Students making the presentation will be graded on criteria that will be handed out early in the semester. All students will be graded on their full participation in the presentations and discussions.

Research topics:
At the end of the lecture series (Lesson 23-29), students will present 15-minute oral summaries of individual library research topics. Guidelines for these presentations will be handed out early in the semester. Graduate students will be expected to also turn in a 10-15 page research paper on an Arctic Vegetation topic of their choice at the end of the course.

Snow Ecology component:
Two lectures plus a Saturday excursion to Eagle Summit to examine the alpine system in winter conditions. The focus will be on subnivian environments, and the effects of topography and snow distribution patterns on plant habitat distribution. This should be a fun day and students will only be graded on attendance.

7. Course schedule and reading assignments:

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Date</th>
<th>Topic</th>
<th>Reading assignment (available online at the course web site <a href="http://www.geobotany.uaf.edu/teaching/biol492/">http://www.geobotany.uaf.edu/teaching/biol492/</a>):</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3</td>
<td>Jan 24, 26</td>
<td>Lectures 1-2: Overview of Arctic Ecosystems: The role of climate and topography</td>
<td></td>
</tr>
</tbody>
</table>
Everyone skim both chapters. Both are long but excellent summaries for North America and Russia. Discussion groups should present overview of their... |
respective chapters, but focus on the specified pages. Be prepared to discuss similarities and differences between the chapters. Why do you think the Russian and American approaches are so different?

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Lectures or Discussions</th>
<th>Details</th>
</tr>
</thead>
</table>
Group 1 should focus on presenting an overview of the key processes described in the formation of permafrost. Group 2 focus on describing how these processes form the permafrost landforms observed in Nature.

<table>
<thead>
<tr>
<th>Date</th>
<th>Lectures/Feb 23, 28, 11-12</th>
<th>Literature discussions</th>
<th>Remarks</th>
</tr>
</thead>
</table>


**Mar 13, 15 Spring Break**
<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture/Activity</th>
<th>References/Notes</th>
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<tbody>
<tr>
<td>Apr 5</td>
<td>No Class</td>
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**Lesson 21:**

*Saturday April 7, All day Snow Ecology Field trip to Eagle Summit, Meet in front of Irving at 8 am*

*(Ned Fetcher and Jim McGraw have done plant ecology research at Eagle Summit for the past 30+ years and these are their key papers. Jim McGraw has worked at the snow drift we will be visiting. **Starred (*) references are mandatory reading for field trip, others if you have time.**)*

Fetcher N 1985 Effects of removal of neighboring species on growth, nutrients, and microclimate of Eriophorum vaginatum Arctic and Alpine Research 17 7-17  
*Fetcher N and Shaver G R 1990 Environmental sensitivity of ecotypes as a potential influence on primary productivity American Naturalist 136 126-131  
**Course policies:**

**Attendance policy:**
Students are expected to attend every class and lab and be seated at the beginning of the class. Student will receive 10 points for attendance at each lecture and each of the student oral presentation classes.

**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://library.uaf.edu/ls101-plagiarism](http://library.uaf.edu/ls101-plagiarism)

Please speak with me if you have any questions about how to properly use other people’s work.

**Evaluation:**

**Summary of grading points:**

**Undergraduate student grading (BIOL 493 students):**

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
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<tbody>
<tr>
<td>Attendance at lectures (10 points per lecture)</td>
<td>130</td>
</tr>
<tr>
<td>Participation in literature discussions (15 pts/ session)</td>
<td>90</td>
</tr>
<tr>
<td>Presentation of literature summaries</td>
<td>100</td>
</tr>
<tr>
<td>Oral presentation of research topic</td>
<td>200</td>
</tr>
<tr>
<td>Snow Ecology exercise participation</td>
<td>100</td>
</tr>
<tr>
<td>TOTAL</td>
<td>620</td>
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</table>

**Graduate student grading (BIOL 693 students):**

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
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<tbody>
<tr>
<td>Attendance at lectures (10 points per lecture)</td>
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</tr>
<tr>
<td>Oral presentation of research topic</td>
<td>200</td>
</tr>
<tr>
<td>Snow Ecology exercise participation</td>
<td>100</td>
</tr>
<tr>
<td>Final research paper</td>
<td>300</td>
</tr>
<tr>
<td>Lead literature discussion session</td>
<td>50</td>
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<tr>
<td>TOTAL</td>
<td>970</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.

All students are expected to accomplish the following:
(a) Attend all lectures (10 points for each lecture attended, 13 total). There will be no make-up for missed lectures, but good reasons for missing the lectures will be accepted if cleared before the lecture.
(b) Attend all the literature discussion sessions, read the assigned reading, and participate actively in each session (15 points for each session, six total),
(c) Give oral summaries of one paper for the literature discussion sessions (100 points).
(d) Give a 15-minute oral presentation of a literature review of a topic of interest related to Arctic vegetation (200 points). Guidelines for the presentations and grading criteria for the presentations will be handed out early in the semester.
(e) Attend the Saturday April 7, snow ecology field trip (100 points).

Additional expectations for graduate students:
(f) Write a 2000-3000-word research paper on an Arctic Vegetation topic of your choice. This paper should have at least 10 literature citations and can include additional tables and figures. This can be the same topic as that of your oral presentation. Late papers will receive a deduction of 15 points of the 300 total for every day late and no credit beyond 3 days late. Students should arrange for an incomplete grade if they cannot meet this deadline (300 points).
(g) Lead some of the literature discussion sessions. This will probably amount to one or two sessions depending on the number of graduate students. This will involve thorough reading of the papers to actively lead the discussion and act as moderator for the session (50 points for each session).

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. AHRB 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.