**TRIAL COURSE OR NEW COURSE PROPOSAL**

**SUBMITTED BY:**
- **Department:** Biology and Wildlife
- **Prepared by:** Donald A. Walker
dawalker@alaska.edu
- **Contact:** CNSM X2460

**1. ACTION DESIRED**
- **Trial Course**
- **New Course**

**2. COURSE IDENTIFICATION:**
- **Dept:** BIOL
- **Course #** 461 / 661
- **No. of Credits** 2
- **Justification for upper/lower division status & number of credits:**
  - Justification for upper division: The Arctic Plants and Vegetation Ecology: LECTURE course will include detailed background and literature study of Arctic plant communities including their composition, structure, paleo-history, major environmental controls, applications of Arctic vegetation methods to current Arctic issues such as climate change, wildlife management, and changing land-use in the Arctic. It will also provide an in depth look at winter vegetation ecology and hands-on introduction of arctic vascular plants, mosses, and lichen. The course requires a solid foundation in basic biology (Biol 115 & 116) and either Introduction to Plant Biology (BIOL 239) or Principles of Ecology (BIOL 271).

  - Justification for graduate 600 stacking: Graduate students will be expected to produce a 10-page written research paper that demonstrates an in-depth knowledge of the literature related to the topic that they will also deliver as an oral presentation. Graduate students will also help to lead the group discussions of the lectures and the reading assignments.

  - Justification for 2 credit hours: This LECTURE component is part of a 2-part package consisting of a spring semester 2-hr LECTURE course, and a 2-hr FIELD (practicum) taught in early summer. Students can enroll in either or both parts. The course consists of the following parts:
    - Lectures on Arctic ecosystems (see course syllabus): 13 hours (780 minutes lecture)
    - Winter ecology: 4 hours of lecture and a field trip to Eagle Summit (240 minutes of lecture, 480 minutes practicum).
    - Overview of key vascular plants, mosses and lichens: 7 hours (420 minutes lecture) lab.

  - TOTAL about 1440 minutes of lecture, 480 minutes of field practicum, and 420 minutes of lab.

**3. PROPOSED COURSE TITLE:**
Arctic Plants and Vegetation Ecology: Lecture

**4. To be CROSS LISTED?**
- **YES/NO:** NO
- **Dept:**
- **Course #**

(Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

**5. To be STACKED?**
- **YES/NO:** YES
- **Dept:** BIOL
- **Course #** 6

**6. FREQUENCY OF OFFERING:**
- **Spring**
- **Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants**

**7. SEMESTER & YEAR OF FIRST OFFERING (AY2011-12 if approved by 3/1/2012; otherwise AY2012-13)**

The package of two 2-hr courses is offered instead of a single 4-hr course because some students taking the LECTURE component will not be able to participate in the FIELD component because of work or other
commitments (e.g. those enrolled in the Wildlife Department with summer internships or jobs). Also we
will list both courses as University of the Arctic offerings and want to give the students the option of
taking either the LECTURE or the FIELD component or (preferably) both.

8. COURSE FORMAT:
NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks
must be approved by the college or school's curriculum council. Furthermore, any core course compressed to less than six weeks must
be approved by the core review committee.

COURSE FORMAT: (check all that apply)
[ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [X] 6 weeks to full semester

OTHER FORMAT (specify)
Mode of delivery (specify lecture, field trips, labs, etc)
[ ] 2-credit-hour lecture course, with lectures and 1 field trip

9. CONTACT HOURS PER WEEK:

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>LAB</th>
<th>PRACTICUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 hr hours/week</td>
<td>7</td>
<td>hours total</td>
</tr>
</tbody>
</table>

Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600
minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-6000 minutes of Internship=1 credit. This must
match with the syllabus. See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/guidelines-for-
computing/ for more information on number of credits.

OTHER HOURS (specify type)
The course consists of the following parts:
- Lectures on Arctic ecosystems (see course syllabus): 13 hours (780
  minutes lecture)
- Winter ecology: 4 hours of lecture and a field trip to Eagle Summit (240
  minutes of lecture, 480 minutes practicum).
- Overview of key vascular plants, mosses and lichens: 7 hours (420
  minutes lecture, 7 hours (420 minutes) lab.
- TOTAL about 1440 minutes of lecture, 480 minutes of field practicum,
  and 420 minutes of lab.

10. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking
(50 words or less if possible):

BIOL F4 Arctic Plants and Vegetation Ecology: Lecture
2 Credits Offered Spring
Arctic plant identification and study of Arctic plant communities including their composition, structure,
paleo-history, biogeography, winter ecology, applications of Arctic vegetation methods to current Arctic
issues including climate change, wildlife management, and changing land-use in the Arctic. Lectures and
1 winter field trip. Prerequisites: BIOL 115 and 116 or equivalent; BIOL 239 or BIOL 271; or approval
of instructor. Special fees apply. Stacked with BIOL F661 (2)

11. COURSE CLASSIFICATIONS: Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H
classification appropriately; otherwise leave fields blank.

H = Humanities S = Social Sciences

Will this course be used to fulfill a requirement
for the baccalaureate core? If YES, attach form.

YES: [X] NO: 

IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, Format 6 W = Writing Intensive, Format 7
Natural Science, Format 8
12. COURSE REPEATABILITY:
   Is this course repeatable for credit? [YES ☐ NO ☒]
   Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

13. GRADING SYSTEM: Specify only one. Note: Later changing the grading system for a course constitutes a Major Course Change.
   LETTER: ☒ PASS/FAIL: ☐

14. PREREQUISITES
   BIOL 115 and 116 or equivalent; BIOL 239 or BIOL 271; or approval of instructor
   These will be required before the student is allowed to enroll in the course.

15. SPECIAL RESTRICTIONS, CONDITIONS

16. PROPOSED COURSE FEES
   $100
   Has a memo been submitted through your dean to the Provost for fee approval? [Yes/No]
   Fee is to pay for i-button temperature loggers, required for examining winter subnivian (below snow) environments, and rental of vans for travel to Eagle Summit.

17. PREVIOUS HISTORY
   Has the course been offered as special topics or trial course previously? [Yes/No] ☒
   If yes, give semester, year, course #, etc.:

18. ESTIMATED IMPACT
   WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

   The main part of the course will require a lecture room with Powerpoint projector facilities.
   The plant identification portion of the lab will require lab space with abundant table or bench space to arrange about 30-50 herbarium collections at a time with dissecting scopes to examine the collections. I would prefer to have this component conducted in the Museum Herbarium to minimize the need to transport herbarium collections to and from Irving.
   I would like to have a few hours (approximately 15 hours) of undergraduate assistant help with this portion of the course because it is time-consuming to gather the specimens from the herbarium collections and return them at the end of the course.

19. LIBRARY COLLECTIONS
   Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.
   No ☒ Yes ☐
   The course will not require extensive library use except for student term papers. All required reading will be posted on the course web site.

20. IMPACTS ON PROGRAMS/DEPTS
   What programs/departments will be affected by this proposed action?
   Include information on the Programs/Departments contacted (e.g., email, memo)
   Only the BIOL Dept and the Museum should be impacted. Steffi Ickert-Bond and the Museum director, Carol Diebel have been contacted (email: September 1, 2011).
21. POSITIVE AND NEGATIVE IMPACTS
Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

This lecture course is part of 3-course curriculum for arctic vegetation science (see cover letter). These courses are much needed. Previously only one 2-hour course was offered in Vegetation Description and Analysis (BIOL 475). A much needed aspect of training students in vegetation science is extensive field experience. Getting students out and observing the plants and vegetation patterns in Nature cannot be done in the classroom, but excursions are often difficult to do in Alaska during the regular academic year. The new Arctic Plants and Vegetation Ecology courses I am offering includes a spring LECTURE component and an EXCURSION component, which is offered in early summer. This is particularly needed for students in Alaska, many of which will be hired by government and non-government agencies to describe and manage the natural resources of the state. It is also increasingly needed for multi-disciplinary academic approaches to study, understand, manage, and preserve complex and changing Earth systems. The courses are organized around my primary expertise and over 40-years experience working in Arctic ecosystems.

JUSTIFICATION FOR ACTION REQUESTED
The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

This course is Lecture part of the 2-course Arctic Plants and Vegetation Ecology package proposed for spring semester 2014.

The course will provide a much-needed focus on Arctic Ecosystems and global Arctic tundra vegetation. The lectures provide broad interdisciplinary approach to understanding the environmental controls of Arctic vegetation. This is important background for students who seek jobs in managing Alaska natural resources and also those interested in impacts of land-use changes and climate change on Arctic systems.

During the plant identification component, students will become familiar with a wide variety of vascular plant species, mosses and lichens and plant family characteristics in the herbarium. If they chose to take the Excursion course, the plant identification will provide a solid background for vegetation sampling, where students otherwise often come with poor knowledge of the local flora.

The course is the lecture component of a 2-course package. A 2-credit excursion course is offered separately. (See accompanying New Course Proposal for Arctic Plants and Vegetation Ecology: Excursion.) The Lecture component will be offered in 2013, and 2014, and in even-numbered years thereafter. Students can take either the LECTURE or EXCURSION or both courses (preferred option).

APPROVALS: Add additional signature lines as needed.

Signature, Chair, Program/Department of: ____________________________ Date Oct 3, 2011

Signature, Chair, College/School Curriculum Council for: ____________________________ Date 10/4/2011

Signature, Dean, College/School of: ____________________________ Date Oct 5, 2011

Signature of Provost (if applicable) Offerings above the level of approved programs must be approved in advance by the Provost.
ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair
Faculty Senate Review Committee: ___Curriculum Review  ___GAAC

___Core Review  ___SADAC

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking)

Signature, Chair, Program/Department of: ___________________________ Date

Signature, Chair, College/School Curriculum Council for: ______________ Date

Signature, Dean, College/School of: _________________________________ Date
Preliminary Syllabus for NEW COURSE, BIOL 461x / 661x, Arctic Plants and Vegetation Ecology: Lecture Spring 2013

1. Course information
Title: Special Topic: Arctic Vegetation Ecology: Lecture
Number: BIOL 461 / 661
Credits: 2
Prerequisites: BIOL 115 & 116, Introduction to Plant Biology (BIOL 239) or Principles of Ecology (BIOL 271) 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,
Office hours: Arctic Health Building, Room 254, X 2460, dawalker@alaska.edu.
Generally available, call before coming.

3. Course readings /materials
Numerous papers will be read and are in the assignments listed in the course calendar and will be posted online at http://www.geobotany.uaf.edu. 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 F4__ Arctic Plants and Vegetation Ecology: Lecture
2 Credits Offered Spring
Arctic plant identification and study of Arctic plant communities including their composition, structure, paleo-history, biogeography, winter ecology, 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 F6__ (2) To be taught in spring 2013 and even numbered years thereafter.

More detailed description: This course consists of three major parts:
1. Lecture component: Thirteen 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, plant communities, floristics, 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. **Arctic plant identification component:** Seven lectures and seven labs. 160 of the most common Arctic species in Alaska, including trees, shrubs, dwarf shrubs, grasses, sedges, rushes, bryophytes, and lichens. Students will be tested over their ability to identify these species.

4. This course is part of a 3-course offering in vegetation science that includes (1) BIOL 461 / 661, Arctic Plants and Vegetation Ecology: Lecture, (2) BIOL 461 / 661, Arctic Plants and Vegetation Ecology: Excursion, and (3) BIOL 462 / 662 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 the ability to identify a foundation set of Arctic plant species that will allow them to undertake vegetation sampling during the summer excursion portion of the course and/or other activities requiring knowledge of Arctic plants.

6. **Instructional method:**
**Lectures:**
Background lectures will take all of the Tuesday and part of Thursday lessons. Students will be expected to read the assignments, and the last half of the Thursday lecture will be devoted to discussion of the readings. One student will be selected to present a 5-minute summary of each assigned paper and to lead a short discussion of the paper. Students will take turns leading the discussions of the various journal papers, Students will receive full credit for participation if it is clear that they read the papers.

**Snow Ecology component:**
All day Saturday field excursion to Eagle Summit. Students should bring a lunch and be prepared for possible severe weather and walking in deep snow. We will visit a variety of sites with different snow regimes, examine the vegetation beneath the snow and on exposed sites, record subnivian temperatures, and examine evidence of winter animal use in the various habitats. This should be a fun day and students will only be graded on attendance.

**Plant identification component:**
Plant identification will be conducted in the Museum classroom (Room ?). Students will work with herbarium specimens and literature sources to learn to identify about 160 common Arctic Alaska plants. Students are expected to read information on plant family characteristics. The final test will cover identification of about of 75 plants and key plant characteristics.
Oral presentations:
At the end of the lecture series (Lesson 16-17), students will present 10-minute oral summaries of individual library research topics. A handout will be given specifying the grading criteria for the oral presentations.

7. Course Schedule and Assignments:

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Dates (to be adjusted for 2013)</th>
<th>Topic</th>
<th>Reading assignment (available online at the course web site <a href="http://www.geobotany.unf.edu/">http://www.geobotany.unf.edu/</a>):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Event</td>
<td>References</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>8-9</td>
<td>Feb 14, 16</td>
<td>Cumulative effects of oil development on Arctic ecosystems</td>
<td></td>
</tr>
<tr>
<td>10-11</td>
<td>Feb 21, 23</td>
<td>Arctic Vegetation Mapping</td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Dates</td>
<td>Topic</td>
<td>References</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>------------</td>
</tr>
<tr>
<td>14-15</td>
<td>Mar 6, 8</td>
<td>Class Presentation of Research topics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mar 12-16</td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>16-17</td>
<td>Mar 20, 22</td>
<td>Arctic plant identification: UAF Museum Room: Overview of plant morphology and dichotomous keys.</td>
<td>Review required plant species names: Trees (6 species) and tall shrubs (4 species), and low shrubs (12 species). Read Web site links to family characteristics for Betulaceae, Salicaceae, Pinaceae</td>
</tr>
<tr>
<td>18-19</td>
<td>Mar 27, 29</td>
<td>Arctic plant identification: Dwarf shrubs</td>
<td>Review required plant species names: Dwarf shrubs (24 species). Read Web site links to family characteristics for Betulaceae, Salicaceae, Caprifoliaceae, Elaeagnaceae, Myricaceae, Rosaceae</td>
</tr>
<tr>
<td>20-21</td>
<td>Apr 3, 5</td>
<td>Arctic plant identification: Grasses, sedges, rushes</td>
<td>Review required plant species names: Grasses (11 species), sedges (11 species), rushes (5 species). Read Web site links to family characteristics for Poaceae, Cyperaceae, Juncaceae</td>
</tr>
<tr>
<td>25-26</td>
<td>Apr 17, 19</td>
<td>Arctic plant identification: Common forbs</td>
<td>Review required plant species names: Forbs (50 species) Read Web site links to family characteristics for Asteraceae (Compositae), Caryophyllaceae, Cruciferae, Fabaceae (Leguminosae), Liliaceae, Onagraceae, Polygonaceae, Ranunculaceae, Rosaceae, Saxifragaceae, Umbelliferae</td>
</tr>
<tr>
<td>27-28</td>
<td>Apr 24, 26</td>
<td>Arctic plant identification: Bryophytes</td>
<td>Review photos and descriptions of required Bryophyte species (14 mosses and 2 liverworts)</td>
</tr>
<tr>
<td>29-30</td>
<td>May 1, 3</td>
<td>Arctic plant identification: Lichens</td>
<td>Review photos and descriptions of required lichen species (22 species)</td>
</tr>
</tbody>
</table>
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
Please speak with me if you have any questions about how to properly use other people’s work.

Attendance policy:
Students are expected to attend every class and lab and be seated at the beginning of the class. If necessary, and with due warning, I will institute a policy of deducting five points for missing class without a prior excuse, and three points for tardiness.

9. Evaluation:

Grading points:

Undergraduate student grading (BIOL 461 students):
- Attendance and participation in literature discussions: 200 pts
- Oral presentation of research topic: 200
- Plant identification exam: 200
- Snow Ecology exercise: 100
- TOTAL: 700 pts

Graduate student grading (BIOL 661 students):
Graduate students will be graded according to the same criteria as the graduate students except that the graduate students are required to turn in 10-15 page research paper on an Arctic Vegetation topic of their choice on the final day of the course. This paper will be worth 30% of the total grade. Late papers will be deducted 15 points of the 300 total for every day late. Students should arrange for an incomplete grade if they cannot meet this deadline.

- Attendance and participation in literature discussions: 200 pts
- Oral presentation of research topic: 200
- Plant identification exam: 200
- Snow Ecology exercise: 100
- Final Paper: 300
- TOTAL: 1000 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.
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.
September 10, 2011

To: UAF Faculty Senate, Curriculum Review Committee

From: Skip Walker, Department of Biology of Wildlife

Re: New and revised courses for an Arctic Vegetation Science curriculum

During my recent Fulbright sabbatical year I was inspired by the vegetation science courses being taught by Prof. Milan Chytry and his colleagues in the Botany and Zoology Department at Masaryk University, Czech Republic. I would like to develop a short curriculum of courses at UAF that would use the methods I learned in the Czech Republic to better train UAF students in vegetation science. One of the keys to the success of the European programs is emphasis on field courses and getting students out and observing the plants and vegetation patterns in Nature. This is difficult to do in Alaska during the regular academic year. The new Arctic Plants and Vegetation Ecology courses I am offering include a spring LECTURE component and an EXCURSION component, which is offered in early summer. This is particularly needed for students in Alaska, many of whom will be hired by government and non-government agencies to describe and manage the natural resources of the state. It is also increasingly needed for multi-disciplinary academic approaches to study, understand, manage, and preserve complex and changing Earth systems. The courses are organized around my primary expertise and over 40-years experience working in Arctic ecosystems.

The curriculum consists of three courses that are designed to give students a thorough practical background and training in vegetation sampling and analytical methods adapted to northern ecosystems:

1. **BIOL 4 / 6 , New Course: Arctic Plants and Vegetation Ecology.**  
   **LECTURE.** 2 Credits. Offered Spring 2013, 2014 and even number years thereafter. Provides a background in Arctic vegetation ecology, Arctic plant identification, and snow-vegetation interactions. In 2013 and even-numbered years thereafter, this course will alternate with BIOL 331 Systematic Botany. (See NOTES below).

2. **BIOL 4 / 6 , New Course: Arctic Plants and Vegetation Ecology.**  
   **EXCURSION.** 2 Credits. Offered Springs of even numbered years. This course is different in name only from Course 2. Provides a solid field experience in vegetation sampling and field knowledge of a wide variety of Arctic plants and plant communities along the Dalton and Elliott highways. The title “Arctic Plants and Vegetation Ecology: EXCURSION” is used to be compatible with the Arctic Plants and Vegetation Ecology: LECTURE course.

3. **BIOL 4 / 6 , Major course change, Vegetation Description and Analysis.**  
   3 Credits. Offered Fall of even numbered years. Revision of BIOL 475 to 3 credits and stacked with 600-level course. The course provides in-depth treatment of the field sampling procedures applied to boreal forest ecosystems, vegetation data management and computer analysis methods.
NOTES:

a. In 2013 and even numbered years thereafter, the Arctic Plants and Vegetation Ecology course will be an alternative to satisfy a botany requirement of the Wildlife Biology and Conservation program. Currently BIOL 331, taught every year by Steffi Ickert-Bond, meets this requirement, but in 2013, Steffi will be on sabbatical, and in even numbered years thereafter she will teach a different course. The Arctic Plants and Vegetation Ecology LECTURE course will be offered as an alternative.

b. The courses will also be listed as University of the Arctic courses, with possible participation by foreign students interested in Arctic ecosystems.

Thank you for considering these proposals.

Best regards,
Skip Walker