Course Syllabus
Ecological Background for Resilience and Adaptation (Fall 2015)

Course Number: NRM 616 / BIOL 616
Class time: Tu. & Th. 9:45 – 11:15 am
Module dates: 9/03/2015 - 10/06/2015
Room: Murie 230

Instructor: Katie Villano Spellman, PhD
Email: katie.spellman@alaska.edu
Phone: 907-388-5178
Office hours: Directly following class or by appointment
Office location: Irving 314

Learning Goals of the Course:
• Develop an understanding of the basics of ecology concepts and methodologies.
• Learn to “speak” ecology and effectively communicate with ecologists.
• Address ecological concepts that will help RAP students with their interdisciplinary research.

Background: RAP provides training to help students with diverse academic backgrounds to communicate across disciplines and address complicated research problems that often require an integrated approach. The ecology module will be designed to foster this process. More specifically, this course will help students without advanced education in ecology to focus their learning on key ecological concepts that may accelerate their capacity to communicate and collaborate with ecologists. For students in with an ecology background, this will be an opportunity to “fine-tune” their understanding of concepts used during their research. Also, this will be an opportunity for ecology students to help their peers, with hopes that the favor will be reciprocated during other modules and throughout their RAP career.

Tasks and grading:

1. Assigned readings, participation, and discussion (25% of grade): Students will be expected to complete assigned readings and actively participate in discussions. Also, each student will be required to lead the discussion of one of the assigned readings during a portion of one class. The student will “break down” the paper to lead discussion on the core concepts, methodologies, and key findings presented in the paper. The presenter will have 30 minutes to present the paper and guide group discussion.

2. Citizen Science Data Collection (25% of grade): Students will participate in a citizen science project where they will collect data on the phenology and senescence of native and non-native plants. The data will contribute to an ecological research effort investigating which types of plants will best take advantage of longer and more variable growing seasons in Alaska. Students are required to collect at least 4 sets of observations. The use of citizen science in this course allows students to gain familiarity with ecological field methods, as well as participate in a learning activity that supports social-ecological system resilience (Berkes 2002, Bäckstrand 2003, Jordan et al. 2012, Pandya 2012, Tidball and Krasny 2012, Spellman 2015). Protocol and background available online at:
https://sites.google.com/a/alaska.edu/projectbrowndown/
3. **Learning Assessment (25% of grade):** We will use pre- and post-course concept maps to assess the change in understanding of the concepts covered in this course. Grades for this assessment activity will be assigned using a standardized evaluation rubric to quantify pre-to post- changes in the concept maps, as well as a two page self-reflection on student learning using the concept maps to identify strong and weak learning areas during the course.

4. **Field Excursion (20% of grade): Sunday, Sept. 20.** In pace of two of the regular class periods, we will make a field excursion to Bonanza Creek Long Term Ecological research area to explore concepts of spatial and temporal dynamics in ecosystems in a setting where these are dynamically on display. We will get our hands dirty conducting a field study on post-fire successional trajectories. **Meet at 9:30 am in the parking lot between the Arctic Health Bldg and the museum.**

5. **Brainstorm Session (5% of grade):** We will use the concepts covered in prior classes during the course to brainstorm ways to fine tune the natural science aspects of the research being conducted by each student enrolled in the course. This will be an opportunity for students to: 1) identify an ecological topic that they will need to address during their research, and/or 2) collect feedback from others on effective ways to incorporate an ecological component into their own research. Prior to the brainstorm session on the October 1, students will send the instructor a brief email addressing the following topics:
   1. Describe the natural sciences component of your research. What are the key concepts and methodologies?
   2. Identify the different disciplines that you will need to become familiar with to complete the natural science component of your research.
   3. Identify some UAF faculty or local experts who may provide key insights to help you develop the natural sciences aspects of your research.
   4. How can we help? What areas could you use some help thinking about in the natural science component of your research?

**Grading Scheme:**

- >90 = A; 80-89 = B; 70-79 = C; 60-69 = D; <60 = F

**Online Course Material Access:** UAF Blackboard system will have required articles posted

**Disabilities Services:** The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. Students and the instructor of this course may work with the Office of Disabilities Services to provide reasonable accommodation to students with disabilities.
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<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignment Due (Student presenting paper in parentheses)</th>
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| Sept. 3 (Thurs) | • Course pre-assessment concept mapping  
  • Approve Syllabus  
  • Introductions and identifying natural science components of each student’s research  
  • History and Dimensions of Ecology                                                                 | • N/A                                                   |
| Sept. 8 (Tues)    | • Scientific method, quantitative research, and communicating with ecologists | • Readings: Norton 1998 (Nils), Pace et al. 2010 (Kelsey) |
| Sept. 10 (Thurs)   | • Field experience with ecological methods (Citizen Science)  
  • MEET IN MURIE 103                                                                                  | • Reading: Parmesan 2006 (Mark)  
  • Familiarize yourself with Project BrownDown by reading the website content |
| Sept. 15 (Tues)    | • Fundamental Concepts: Ecosystem ecology and the carbon story                                                           | • Reading: Schuur et al. 2013 (Taylor), Hobbie et al. 2000 (Eduard) |
| Sept. 17 (Thurs)   | RAP RETREAT                                                                                                            |                                                        |
| Sept. 20 (Sunday)  | • Field Excursion at Bonanza Creek LTER site (Meet at 9:30 am)  
  -Fundamental concepts in the field: Disturbance and temporal dynamics-Succession, permafrost, ecosystem services | • Reading: Chapin et al. 2002, pg. 281-292 (Aurora), Chapin et al. 2010 (Sherri) |
| Sept. 22 (Tues)    | • Fundamental Concepts: Community ecology and biodiversity  
  • Ecological foundations of resilience theory                                                                 | • Readings: McCann 2000 (Steffen), Chapin et al. 2000 (Gwen) |
| Sept. 24 (Thurs)   | • No class                                                                                                              |                                                        |
| Sept. 29 (Tues)    | • Fundamental Concepts: Population ecology and trophic dynamics                                                         | • Reading: Stewart and Konar 2012 (Johanna)              |
| Oct. 1 (Thurs)     | • Brainstorm session on student natural science component of student research-questions, methods, and networking         | • Brainstorm Session Email sent to Katie prior to the day before class with answers to the questions detailed above |
| Oct. 6 (Tues)      | • Post-assessment concept mapping and self-reflection  
  • Citizen science data due                                                                              | • Citizen science data due: 4 sets of observations (described in detail above) |