Syllabus: WILD 3830 Range plant taxonomy and function

Location: Natural Resources Building 217
Time: Fall 2021; Wednesdays 12:30-5:30
Instructor: Dr. Andrew Kulmatiski, andrew.kulmatiski@usu.edu, NR 224
Office hours: Tuesdays and Thursdays 1:30-3:00 and by appointment.
Undergraduate Teaching Fellows: Cole Walton and Myckaela Hammon
Course website: Look up course on Canvas: https://usu.instructure.com/courses/613205
Course fee: $100 to cover travel to field sites

COURSE FORMAT: 3 credits. One, five-hour class/laboratory meeting each Wednesday. There will also be all-day field trips on Saturday 4 September and Saturday 11 September and a four-day trip to Southern Utah in 19-22 Nov. The final exam will be on 1 December.

COURSE OBJECTIVES:
- To identify the important/common plants of wildlands in the Intermountain West.
- To develop the ability to use taxonomic keys to identify plants.

COURSE DESCRIPTION: Identification of dominant forb, grass, grass-like and woody species found in major plant communities of the Intermountain West. Also includes limited coverage of dominant species of southwest desert plant communities. Plant identification is based on 1) sight-recognition of characteristic morphological features and understanding the context in which a plant is found and 2) the use of taxonomic keys. We will also spend one day practicing vegetation sampling techniques.

This should be a fun course. I have designed it to make sure that you know the species before you are tested on them. You will learn about 120 plant species (family, genus, species, common name), but there is no reason that everyone shouldn’t get an A.

COURSE STRUCTURE:
This course is field-based. We will have two full-day field trip on 4 and 11 September to learn some high-elevation plants, but the bulk of the course (about 10 weeks, depending on weather) will occur on Wednesdays in field sites around Cache Valley. Each week you will be introduced to 5-20 plant species common to a site. We will have a laboratory-based final the week after Thanksgiving in which you will use taxonomic keys to identify three unknown plant species that may or may not have been covered during the course.

Daily quizzes (50% of grade): At the beginning of each day in the field, the UTFs and I will review with you the species introduced during the previous week. You will have about 30 minutes to review these species before taking a quiz on those species. These daily quizzes account for about 44% of your grade (depending on the total number of species covered this year). We will then spend about an hour using taxonomic keys to identify one to three 'unknown' plant species. The final hour of the class will be used to learn a new set of plant species that will be quizzed the following week. Any remaining time will be available to review the new species for the week. The UTFs and I will work with each of you independently to make sure you are correctly identifying plants.

Keying quizzes (10% of grade): The UTFs and I will work through the class list to make sure that each student demonstrates their ability with the key three times during the semester. These keying ‘quizzes’ will be worth about 10% of your grade. This general schedule will hold true for most of the semester though there will likely be one or two sites where we will learn and be quizzed on plants during one day (i.e., there are only about five halophyte species in the valley so we will learn and be quizzed on these during one day).

Field Notes: You will be responsible for keeping a field notebook for the class. The notebook should contain notes (i.e., drawings or pressed samples, text) for each plant species that will help you remember the species. These notes will not be graded, but will really help you learn the species.

Mid-term (30% of grade): The mid-term (11 November) will be a cumulative test of the species covered in our field trips and will be worth about 31% of your grade.

Final (10% of grade): The final exam (18 November) will have you key out three unknown species.
LAB/FIELD EQUIPMENT:
FIELD TRIPS: COME EARLY, COME PREPARED.

The buses will depart from fleet services at 12:35 exactly. If you miss the bus you will have a very hard time learning the plants. The field trips may be hot and dry or cold and wet so be sure to come prepared with appropriate field cloths. I have been in one of our field sites in August when the temperature dropped from 80 to 45 and I was caught in a terrific hailstorm – come prepared. If you are unsure of what would be needed contact the instructor. At a minimum, bring a rain jacket, rain pants and water bottle to each class.

You are responsible for supplying your own magnifying lens for viewing minute plant features in labs and on field trips. You should purchase a 10X to 20X lens. Several magnifying lenses are available online at Amazon.com, ranging in price from $4.00 to 8.00 – they are sold as “Jeweler’s Loupes.” The USU Bookstore (Logan Campus) sells 10X lenses for $13.00 to $15.00.

Students must bring a notebook and writing tools to take notes during field trips. Students are strongly encouraged to purchase an artist’s drawing pad or plant press (to be discussed in class) and collect plants on field trips. Having samples of the plants to study at home will be a great help in learning the plants. Secret bonus: if you have read this far in the syllabus, you are privy to a secret bonus – I will give 10 bonus points for each good to excellent quality mounted plant sample of species from the course that you produce. See me or the UTFs for more details. Double-secret bonus – I give 10 bonus points for attending Ecology Center lectures.

STUDENT ASSESSMENT:

- **Daily Quizzes** (see Schedule below). You will be quizzed on species identification in the field. For each species, you will get two, three, two and three points for the correct Family (or Tribe), Genus, Species, and common name, respectively ~ 1550 points.
- **Keying quiz:** Each student will have to key three species during the semester = 300 points
- **Midterm** (test of all local species): 110 species x 10 points = 1100 points
- **Final:** Use a taxonomic key to identify three plants not covered during the course (100 points each for Family, Genus, and Species): 300 points

Total points: 3250

Grade Distribution*:

<table>
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<tr>
<th>Score Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>3023-3250 (93%+)</td>
<td>A</td>
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<tr>
<td>2925-3022 (90-92.9%)</td>
<td>A-</td>
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<tr>
<td>2860-2924 (87-89.9%)</td>
<td>B+</td>
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<tr>
<td>2698-2859 (83-86.9%)</td>
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<td>2600-2697 (80-82.9%)</td>
<td>B-</td>
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<tr>
<td>2503-2599 (77-79.9%)</td>
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<td>2373-2502 (73-76.9%)</td>
<td>C</td>
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<tr>
<td>2275-2372 (70-72.9%)</td>
<td>C-</td>
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<tr>
<td>1950-2274 (60-69.9%)</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 1949 (&lt;59.9%)</td>
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</tbody>
</table>

*NOTE*: The exact grading scheme will depend on the exact number of species we cover which will depend a little bit on which plants are flowering and the weather. The concept, however, is that you can get 5% of the species wrong and get an ‘A’, 10 % wrong for an ‘A-’, 12% wrong for a B+, etc. So if you miss one or two species each week - don’t worry.

TEACHING ASSISTANTS:

Cole Walton and Myckaela Hammon are our UTFs this year. They both took the course last year and really know their plants. They will be with us each week to help you learn the plants. Talk to them and ask for help.

ACCESS TO HERBARIUM SPECIMENS FOR STUDY:

Study sets of herbarium samples will be placed at the back of NR217 or on racks at the west end of the second floor NR hallway each week. You may take the study sets down to the atrium to study but be careful with them and be sure to return them when done. Everyone uses these.

NOTE: Study mounts will seldom be used for ID quizzes or the ID parts of the midterm and final exams. Your job is to not learn the mounts but to learn the plant characteristics.
READING MATERIALS:
The taxonomic key ‘Vascular plants of Northern Utah: an identification manual’ by Richard J. Shaw is the required text for the class. You will use this book each week to ‘key’ a plant in the field. If you want to better understand plant family characteristics, I highly recommend another book, Botany in a Day: The Patterns Method of Plant Identification by Thomas J. Elpel (2004, HOPS Press LLC, Silver Star, MT). Both books should be available in the Bookstore or online.

CANVAS:
This course is field-based. You will rely primarily on your time in the field and your field notes to learn the species. That said, several documents and PowerPoint presentations will be placed on the Black Board site for this course. They include: 1) the course syllabus; 2) a list of the ~150 plant species organized by plant set; and 3) a summary of plant family and tribe characteristics.

ABSENTEEISM POLICY:
Attending class and field trips, reviewing herbarium specimens, and being in lab when each quiz is given are your responsibility. If you miss a quiz, you must present a valid excuse (e.g. doctor’s statement, jury selection, field trip in another course, etc.) before you can make it up. If you know you will be absent, please contact the instructor beforehand to see if your excuse is acceptable, and to make arrangements for a makeup quiz.

ACCOMODATIONS FOR DISABILITIES:
Students with physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. All accommodations are coordinated through the Disabilities Resource Center (DRC) in Room 101 of the University Inn, 797-2444 voice, 797-0740 TTY, or toll free at 1-800-259-2966. Please contact the DRC as early in the semester as possible. Alternate format materials (Braille, large print or digital) available with advance notice.

ACADEMIC INTEGRITY:
Each student has the right and duty to pursue his or her academic experience free of dishonesty. The Honor System is designed to establish the higher level of conduct expected and required of all USU students. Infractions (cheating, falsification, and plagiarism) and their associated penalties are described in the USU Academic Policies and Procedures Manual (www.usu.edu/policies/pdf/Acad-Integrity.pdf).

SCHEDULE

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<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Sep. 1</td>
<td>NR 217. Course Introduction</td>
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<tr>
<td>Sep. 4</td>
<td>All day field trip: Quiz Set 1 (~5 spp), Introduce Set 2 (~15 spp)</td>
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<tr>
<td>Sep. 8</td>
<td>Field trip: Quiz Set 2, Introduce Set 3 (~10 spp)</td>
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<tr>
<td>Sep. 11</td>
<td>All day field trip: Quiz Set 2, Introduce Set 3 (~15 spp)</td>
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<td>Sep. 15</td>
<td>Field trip: Quiz Set 3, Introduce Set 4 (~10 spp)</td>
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<td>Field trip: Quiz Set 6, Introduce Set 7 (~15 spp)</td>
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<td>Oct. 13</td>
<td>Field trip: Quiz Set 7, Introduce Set 8 (~15 spp)</td>
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<td>Oct. 20</td>
<td>Field trip: Quiz Set 8, Introduce Set 9 (~15 spp)</td>
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<td>Oct. 27</td>
<td>Field trip: Quiz Set 9; Introduce Set 10 (~15 spp)</td>
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<td>Nov. 3</td>
<td>Field trip: Quiz Set 10; Introduce Set 11 (~10 spp)</td>
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<tr>
<td>Nov. 10</td>
<td>Field trip: Quiz Set 11 and review mounts in classroom</td>
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<tr>
<td>Nov. 17</td>
<td>Midterm (sight-identification of ~100 mounted specimens)</td>
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<td>Nov. 19-22</td>
<td>St. George Trip</td>
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Nov. 24  Thanksgiving break
Dec. 1   Final (key 3 unknown species)
Dec. 8   No Class
Dec. 15  No Class

**TENTATIVE SPECIES LIST**

Note: This species list is approximate. Depending on environmental conditions, we may not be able to locate or identify some plants and we may encounter some plants that are not on the list.

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<th>Family</th>
<th>Genus</th>
<th>Species</th>
<th>Common Name</th>
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<td>Rhus glabra</td>
<td>Smooth sumac</td>
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<td>Apiaceae</td>
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<td>Apiaceae</td>
<td>Lomatium dissectum</td>
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<td>Apocynum cannibinum</td>
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<td>69</td>
<td>Pinaceae</td>
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70 Pinaceae Pinus flexilis Limber pine
71 Pinaceae Pinus ponderosa Ponderosa pine
72 Pinaceae Pinus contorta Lodgepole pine
73 Pinaceae Pseudotsuga menziesii Doug fir
74 Poaceae Dactylis glomerata Orchard grass
75 Stipeae Achnatherum lettermanii Letterman's needlegrass
76 Poeae Festuca idahoensis? Idaho fescue
77 Poeae Poa bulbosa Bulbous bluegrass
78 Poeae Poa pratensis Kentucky bluegrass
79 Polemoniaceae Ipomopsis aggregate Scarlet gilia
80 Polemoniaceae Polemonium foliosissum Jacobs ladder
81 Polygonaceae Eriogonum spp desert buckwheat
82 Polygonaceae Polygonum douglasii? ?
83 Polygonaceae Rumex crispus Dock, sorrel
84 Ranunculaceae Aquilegia coerulea Colorado columbine
85 Ranunculaceae Delphinium occidentalis Duncecap larkspur
86 Ranunculaceae Thalictrum fendleri meadow rue
87 Rhamnaceae Caenothus velutinus snowbrush
88 Roseaceae Purshia tridentata bitterbrush
89 Roseaceae Amelanchier alnifolia Saskatoon, serviceberry
90 Roseaceae Cercocarpus ledifolius Curl-leaf Mtn. Mahogany
91 Roseaceae Cercocarpus montanus Alder leaf mtn. mahogany
92 Roseaceae Pentaphylloides floribunda pentaphylloides
93 Roseaceae Potentilla gracillis Slender cinquefoil
94 Roseaceae Potentilla glandulosa Sticky cinquefoil
95 Roseaceae Prunus virginiana chokecherry
96 Roseaceae Rosa woodsia Wood'
97 Roseaceae Sorbus scopulina Mtn. ash
98 Rubiaceae Gallium spp bedstraw
99 Salicaceae Populus balsamifera Balsam poplar
100 Salicaceae Populus fremontii Fremont cottonwood
101 Salicaceae Salix exigua Coyote or sandbar willow
102 Sapindaceae Acer glabrum Rocky maple
103 Sapindaceae Acer grandidentatum Bigtooth maple
104 Sapindaceae Acer negundo Box elder
105 Scrophulariaceae Penstemon humilus Low penstemon
106 Scrophulariaceae Verbascum thapsus Common mullein
107 Stipeae Stipa hymenoides Indian ricegrass
108 Triceae Thinopyrum intermedium Intermediate wheatgrass
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<th>Page</th>
<th>Family</th>
<th>Genus</th>
<th>Species</th>
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<tr>
<td>109</td>
<td>Triticeae</td>
<td>Elymus</td>
<td>trachycaulus</td>
<td>Slender wheatgrass</td>
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<td>Triticeae</td>
<td>Leymus</td>
<td>cinerus</td>
<td>Basin wildrye</td>
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<td>Triticeae</td>
<td>Pascopyrum</td>
<td>smithii</td>
<td>Western wheatgrass</td>
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<td>Triticeae</td>
<td>Pseudoroegneria</td>
<td>spicata</td>
<td>Bluebunch wheatgrass</td>
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<td>Triticeae</td>
<td>Secale</td>
<td>cereale</td>
<td>Cereal rye</td>
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<td>Triticeae*</td>
<td>Hordeum</td>
<td>brachyantherum</td>
<td>Meadow barley</td>
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<td>Ulmaceae</td>
<td>Ulmus</td>
<td>siberica</td>
<td>Siberian elm</td>
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