Spring 2-1-2019

BIOO 335.00: Rocky Mountain Flora

Lila Fishman

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Office: Interdisciplinary Science Building (ISB) 319
Office hours: Tues/Thurs 11:30 -1:00 or by appt.

Teaching Assistants (for labs): office hours and contact info TBA in lab
Robert Niese (robert.niese@umontana.edu)
Colette Berg (colette.berg@umontana.edu)
Laurel Genzoli (laurel.genzoli@umontana.edu)

Course Objectives and Learning Outcomes
Welcome to the fascinating world of plant diversity! This course introduces basic concepts in plant systematics (plus ecology and evolution), with focus on the vascular plants of Montana.

• Learn general skills of plant identification and classification
• Recognize important plant families and genera of the region
• Understand the origins and functions of plant diversity in Montana

Course format
The lecture and lab components of this course are highly integrated, and you will receive a single composite grade. The Lectures provides a systematic overview of families and genera, as well as the conceptual framework and terminology necessary for identifying and studying land plants. The lab is structured to reinforce the lecture material and to exercise hands-on plant ID skills, including keying to the species level.

Lecture: MW 11:00-11:50 in McGill 210

Labs: Thursdays/Fridays in NS202.

• Thursday Labs: 10:00-11:50 (02, Robert), 1:00-2:50 (03, Laurel), 3:00-4:50 (04, Laurel)
• Friday Labs: 9:00-10:50 (05, Colette), 12:00-1:50 (06, Colette)

More detail on lab assignments and grading will be provided in the labs.
Note: Your lab notebook will be graded, so plan on keeping separate notebooks for Lecture and Lab (or use a 3-ring binder for everything and separate the lab material at the end of the semester).
Course materials

Texts and equipment (available in bookstore)
Required: Lesica, P. Manual of Montana Vascular Plants (please bring to every lab after first week)
Optional: Plant dissection tools kit (this can be useful in lab)
Optional: Illustrated field guide such as Plants of the Rocky Mountains, guides to family-level identification (e.g. Botany in a Day), and online guides such as Montana Plant-Life may be used as resources for field ID. However, they are not always suitable for species-level identification and taxonomies vary, so use the Lesica text and the provided lecture/lab materials as your final authority.

Moodle Course Supplement
All materials (handouts, PowerPoint presentations, etc.) will be posted on the course Moodle page. Please contact me if you have trouble accessing materials for this course via Moodle (but see UMOnline for general Moodle issues!) Each lab will also have a Moodle page as well. Note: The online materials are intended as a supplement to in-class note-taking, not as a substitute for attendance. You are expected to attend all lectures and labs.

Assessment
Course grades will be based on 2 in-class exams, a final exam, and the lab.

<table>
<thead>
<tr>
<th>Points per assignment</th>
<th>Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>A-, A = 90-100%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>B-, B, B+ = 80-89%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>C-, C, C+ = 70-79%</td>
</tr>
<tr>
<td>Lab</td>
<td>D-, D, D+ = 60-69%</td>
</tr>
<tr>
<td>Total</td>
<td>F = ≤60</td>
</tr>
</tbody>
</table>

Note: percentages corresponding to letter grades are guidelines, but any curving will be in favor of students (i.e., a score 80% = B- or better). We generally DO NOT have to curve the course.

Late/missed exams
If you must miss an exam due to a schedule conflict with an approved activity (e.g., participation in a UM-team sporting event), please notify me at least a week prior to the exam so that an alternative exam and time can be arranged. If you miss an exam due to an unplanned event (e.g., illness, car accident) you must contact me via email as soon as physically possible (i.e., within a day). Make-up exams may be possible, with appropriate justification. Your TA is your contact person for making up missed labs and will provide his/her policies regarding lab assignments during the first weeks of lab.

Extra credit
Students can earn extra credit points (up to 5 points, for one observation) for sharing plant-related observations and/or questions at the beginning of lecture in weeks 2-13. Please post a photo or note to the Extra Credit link on Moodle by 9:00 am pre-lecture, so that I have a record of your points and can add any images in the day’s slides. You must be present in class to earn points. This is the only extra credit opportunity, so please take advantage of it prior to the end of the course.
General policies

Students with disabilities
The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS. We are happy to work with you and DSS to provide appropriate accommodations for your learning and assessment; please make any requests for accommodation as early during the semester as possible.

Academic Misconduct
Although you may work collaboratively during the labs, any work submitted for grading must be exclusively your own. Cheating on exams or quizzes is, of course, a violation of the Student Conduct Code. Cheating includes permitting another student to copy your work during an exam. Furthermore, copying another student’s specimen labels or mounting specimens you did not collect or ID yourself is as much cheating as copying exam or quiz answers. In addition, you may not turn in work from another course (including, for example, a plant collection from a previous offering of this course) for credit in this course. Students found to violate the Academic Conduct Code will receive a failing grade for the course, and will also be fully subject to University sanctions. For more information on UM policies on misconduct, see the Student Conduct Code.

Adds, drops, and changes of grading
University policies are described in the course catalog. For general information on the semester schedule, see UM’s dates and deadlines document. We will follow University policies (http://www.umt.edu/registrar/students/dropadd.php) on drops, adds, changes of grading basis, etc. in this course. After the 15th day of instruction, status changes are not automatic through Cyberbear. I will generally approve changes in grading status until the week after Exam 1 grades are posted; later changes to grading status (e.g., a switch to CR/NC) will require substantial justification of extenuating circumstances.

How to succeed in this course

Be present!
You will get the most out of this course by committing to attend all of the lectures and labs. There is a TON of new terminology, and we USE that terminology in identifying plants. Therefore, it is important to keep up with the material weekly rather than trying to assimilate it all at once before each exam.

Ask questions!
Questions during the lecture and lab are always encouraged. Please talk to me or your TA as soon as you need help with any material, or if you just have questions about plants. Different study strategies are most effective for different topics (and learning types); take advantage of our accumulated experience rather than going it alone. My office hours and open lab times later in the semester are reserved for students. If you cannot attend scheduled office hours, please contact me via email (lila.fishman@mso.umt.edu) to arrange an individual meeting time.

Look closely at the world around you!
The point of this class is to give you the tools to identify and understand the abundant and diverse plant life around you, so practice looking at plants systematically whenever you can.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture topics</th>
<th>Lab topics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan. 10</td>
<td>No class or lab this week</td>
<td>List pages are in Lesica key</td>
</tr>
<tr>
<td>1</td>
<td>Jan. 14</td>
<td>1. Course Intro</td>
<td>Lab intro</td>
</tr>
<tr>
<td></td>
<td>Jan. 16</td>
<td>2. Plant Systematics &amp; Taxonomy</td>
<td>handouts</td>
</tr>
<tr>
<td>2</td>
<td>Jan. 21</td>
<td><strong>MLK Jr. Holiday - no class</strong></td>
<td>Non-seed plants</td>
</tr>
<tr>
<td></td>
<td>Jan. 23</td>
<td>3. Non-seed plants (mosses, ferns)</td>
<td><em>Handouts, p. 52-72</em></td>
</tr>
<tr>
<td>3</td>
<td>Jan. 28</td>
<td>4. Conifers</td>
<td>Conifers, walk &amp; keying</td>
</tr>
<tr>
<td></td>
<td>Jan. 30</td>
<td>5. Conifers 2</td>
<td><em>Handouts, p. 73-81</em></td>
</tr>
<tr>
<td>4*</td>
<td>Feb. 4</td>
<td>6. Angiosperms – vegetative terms</td>
<td>Flowers - Ranunculaceae</td>
</tr>
<tr>
<td></td>
<td>Feb. 6</td>
<td>7. Ranunculaceae and Floral terms</td>
<td><em>handouts, p. 81-102</em></td>
</tr>
<tr>
<td>5</td>
<td>Feb. 11</td>
<td>8. Caryophyllaceae +</td>
<td>Caryophyllaceae, <em>Opuntia</em>, etc.</td>
</tr>
<tr>
<td></td>
<td>Feb. 13</td>
<td>9. Rosaceae</td>
<td><em>p. 111-164</em></td>
</tr>
<tr>
<td>6*</td>
<td>Feb. 18</td>
<td><strong>Presidents’ Day Holiday - no class</strong></td>
<td>Rosaceae, Saxifragaceae, <em>Ribes</em></td>
</tr>
<tr>
<td></td>
<td>Feb. 20</td>
<td>10. More Rosids</td>
<td><em>p. 243-289</em></td>
</tr>
<tr>
<td>7</td>
<td>Feb. 25</td>
<td><strong>EXAM 1 (Lectures 1-9)</strong></td>
<td>Salicaceae, Betulaceae, <em>Acer</em></td>
</tr>
<tr>
<td></td>
<td>Feb. 27</td>
<td>11. Rosidae trees</td>
<td><em>p. 181-185, 108-110, 351</em></td>
</tr>
<tr>
<td>8</td>
<td>Mar. 4</td>
<td>12. Brassicaceae, Onagraceae, Fabaceae</td>
<td>Rosidae herbs</td>
</tr>
<tr>
<td></td>
<td>Mar. 6</td>
<td>13. Reproductive diversity</td>
<td><em>p. 186-224, 290-340,</em></td>
</tr>
<tr>
<td>10</td>
<td>Mar. 18</td>
<td>16. Asteridae II</td>
<td>Solanaceae, Lamiaceae, Boraginaceae</td>
</tr>
<tr>
<td></td>
<td>Mar. 20</td>
<td>17. More Asteridae</td>
<td><em>p. 341-395, 403-426, 459-462, 237</em></td>
</tr>
</tbody>
</table>

SPRING BREAK
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture topics</th>
<th>Lab topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Apr. 1</td>
<td>18. Asteraceae, Apiaceae, etc.</td>
<td>Asteraceae, Apiaceae, <em>Phlox</em> etc.</td>
</tr>
<tr>
<td></td>
<td>Apr. 3</td>
<td>EXAM 2 (Lectures 10-17)</td>
<td>p. 472-580</td>
</tr>
<tr>
<td>12*</td>
<td>Apr. 8</td>
<td>19. Intro to monocots - Liliaceae</td>
<td>Liliaceae, Orchidaceae, <em>Iris</em></td>
</tr>
<tr>
<td></td>
<td>Apr. 10</td>
<td>20. Orchidaceae and <em>Iris</em></td>
<td>p. 717-742</td>
</tr>
<tr>
<td>13</td>
<td>Apr. 15</td>
<td>21. Poaceae (Grasses)</td>
<td>Poaceae, Collection prep</td>
</tr>
<tr>
<td></td>
<td>Apr. 17</td>
<td>22. Domestication</td>
<td>p. 645-715, <em>handouts</em></td>
</tr>
<tr>
<td>14*</td>
<td>Apr. 22</td>
<td>23. Rushes and sedges</td>
<td>Cyperaceae, Juncaceae, <strong>Lab final</strong></td>
</tr>
<tr>
<td></td>
<td>Apr. 23</td>
<td>24. Review</td>
<td>p. 593-644, <em>handouts</em></td>
</tr>
<tr>
<td><strong>May 2</strong></td>
<td><strong>FINAL EXAM 10:10-12:00</strong></td>
<td></td>
<td>Plant collection due at final exam</td>
</tr>
</tbody>
</table>
NON-VASCULAR PLANTS
Recognize mosses vs. other plants

FERNS AND THEIR ALLIES
Equisetaceae
Polypodiaceae
Lycopodiaceae

ANGIOSPERMS (FLOWERING PLANTS)

BASAL FAMILIES
Nymphaeaceae

EUDICOTS

BASAL EUDICOTS
Ranunculaceae
   Delphinium, Ranunculus, Aquilegia
Berberis/Mahonia (Berberidaceae)

CARYOPHYLLIDAE
Caryophylllaceae
   Silene
Polygononaceae
   Eriogonum
Opuntia (Cactaceae)
Lewisia (Portulacaceae)
Chenopodium (Amaranthaceae)

ROSIDAE
Saxifragaceae
   Lithophragma
Onagraceae
   Chamerion/Epilobium
Brassicaceae
   Sisymbrium
Fabaceae
   Lupinus, Vicia
Rosaceae
   Amelanchier, Prunus, Rosa, Potentilla
Salicaceae
   Salix, Populus
Betulaceae
   Betula, Alnus
Acer (Aceraceae)
Ribes (Grossulariaceae)
Viola (Violaceae)

MONOCOTS

Petaloid Monocots
Liliaceae
   Erythronium, Fritillaria
Orchidaceae
   Calypso %
Iris (Iridaceae) (%

Grasslike Monocots
Poaceae
   Agropyron, Festuca
Cyperaceae
   Carex
Juncaceae
   Juncus

GYMNOSPERMS (CONIFERS)
Pinaceae
   Abies, Larix, Picea, Pinus, Tsuga
   Pseudotsuga
Cupressaceae
   Juniperus, Thuja
Taxaceae
   Taxus

ASTERIDAE

Ericaceae
   Arctostaphylos, Vaccinium
Solanaceae
   Solanum
Boraginaceae
   Myosotis
   “Scrophulariaceae” (now 3+ families)
   Castilleja, Mimulus, Penstemon
Lamiaceae
   Agastache
Caprifoliaceae
   Linnaea, Symphoricarpos
Apiaceae
   Lomatium
Asteraceae
   Artemisia, Balsamorhiza, Centaurea
Cornus (Cornaceae)
   Philadelphus (Hydrangaceae)
   Dodecatheon (Primulaceae)
   Phlox (Polemoniaceae)