BIOO 335.00: Rocky Mountain Flora

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

Course Objectives

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

Instructor: Prof. Lila Fishman
Email: lila.fishman@msou.montana.edu
Phone: 243-5166
Office: 309A Health Sciences Bldg.
Office Hours: T/Th 12:00-1:00 in HS309A, plus open lab times TBA

Teaching Assistants (in charge of labs): office hours and contact info TBA in lab
Ryan Hegstad (ryan1.hegstad@umontana.edu)
Jacob Lucero (jacob.lucero@umontana.edu)
Robert Niese (robert.niese@umontana.edu)

Lectures: MW 11:10-12:00 in McGill Hall 210

- Texts and equipment (available in bookstore)
  - Required: Lesica, P. Manual of Montana Vascular Plants (bring to every lab)
  - Optional: Plant dissection tools kit
  - Optional: Illustrated field guide such as Plants of the Rocky Mountains. However, field guides are NOT a substitute for the Lesica text, as they are not suitable for species-level plant ID here. Botany in a Day is a good guide to family-level identification. There are also many useful online guides to both terminology and taxa, such as those at Learn Plants Now and Montana Plant-Life. However, please use these resources for images and supplementary information only. Taxonomies and definitions vary (and the internet is full of mis-information), so use the text and lecture/lab materials that we provide as your final authority (or ask!!).

Labs: Thursdays 10:10-12:00, 1:10-3:00, 3:10-5:00, Fridays 9:10-11:00, 12:10-2:00 NS 202.
Laboratory content and grading will be explained during the 1st lab session. We will go outside some days, so please wear appropriate footwear/outerwear. Please bring your Lesica text and dissecting kit (if you have one) every session. 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 materials at the end of the semester for grading).

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

**Course grades: 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>
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<tbody>
<tr>
<td>Exam 1 100 points (20%)</td>
<td>A-, A = 90-100%</td>
</tr>
<tr>
<td>Exam 2 100 points (20%)</td>
<td>B-, B, B+ = 80-89%</td>
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<tr>
<td>Final Exam 150 points (30%)</td>
<td>C-, C, C+ = 70-79%</td>
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<tr>
<td>Lab 150 points (30%)</td>
<td>D-, D, D+ = 60-69%</td>
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<tr>
<td>Total 500 points</td>
<td>F = &lt;60%</td>
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</tbody>
</table>

Note: The point percentages corresponding to letter grades are guidelines, not absolutes. However, any curving will be in favor of students (that is, if you score 80%, you will get at least a B-). More detail on lab assignments and grading will be provided in the labs.

**Late/missed exams**
If you must miss an exam due to a schedule conflict with an approved activity (e.g., participation in a sporting event), please let me know 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, etc.), you must contact me via email as soon as possible (i.e., not the following week). Make-up exams may be possible, with appropriate justification. Your TA will provide policies regarding late/missed lab quizzes/assignments during the first weeks of lab.

**General policies**
University policies (http://www.umt.edu/registrar/students/dropadd.php) on drops, adds, changes of grading basis, etc. will be observed. 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, but later changes will require substantial justification.

**Accessibility policies**
The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). Please contact DSS if you may have a disability requiring accommodation, and we will work with you and DSS to provide appropriate accommodation. **You must let me know by the Monday of an exam week if you will be using DSS services for exam-taking.** Please contact me directly about accessibility issues with course documents; they were recently re-formatted, but may not be ideal yet.

**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, and by doing any assigned readings prior to class. There is TON of new terminology in this course; it is important to keep up with it weekly or you could become overwhelmed.

- **Ask questions!**
  Questions during lecture and lab are encouraged. Please let me know if you need help with any material; my office hours and open lab times are reserved for students. If you cannot attend office hours, please contact me to arrange another 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 plant life around you, so practice looking at plants systematically whenever you can.

- **Gain extra credit!**
  You can earn extra credit points (up to 8 total, 4 each x 2 times, in weeks 2-13) for sharing plant-related observations and questions at the beginning of each lecture. **Please post an accompanying photo or note to the Extra Credit link on Moodle (in first section) by 9:00 am pre-lecture, so that I have a record of your points and can put any images in the day’s slides.**
**BIOO 335: ROCKY MOUNTAIN FLORA**

**SPRING 2015 SCHEDULE**

*Note: This is a guide to course content and the general order of topics, but is subject to adjustment during the semester; natural groups of taxa don’t always fit neatly into 50 minutes! Updates will be posted online. Exam dates will not change. Asterisks indicate the likely dates of lab quizzes.*

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings (in Lesica book)</th>
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</thead>
<tbody>
<tr>
<td>January 26</td>
<td>1. Course Intro/Overview of land plants</td>
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<tr>
<td>January 28</td>
<td>2. Plant Systematics &amp; Taxonomy</td>
<td></td>
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<tr>
<td>February 2</td>
<td>3. Non-seed plants</td>
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<tr>
<td>February 4</td>
<td>4. Seed Plants - Gymnosperms</td>
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<tr>
<td>February 9</td>
<td>5. More Gymnosperms</td>
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<tr>
<td>February 11</td>
<td>6. Intro to Angiosperms – Vegetative terms</td>
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<td><strong>February 16</strong></td>
<td><strong>President's Day Holiday - no class</strong></td>
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<tr>
<td>February 18</td>
<td>7. Floral terms &amp; Basal Angiosperms</td>
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<tr>
<td>Lab 4*</td>
<td>Flowers - Ranunculaceae</td>
<td></td>
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<tr>
<td>February 23</td>
<td>8. Caryophyllaceae</td>
<td>54-56</td>
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<tr>
<td>February 25</td>
<td>9. Other Caryophyllidae</td>
<td></td>
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<tr>
<td>March 2</td>
<td>10. Rosaceae</td>
<td>181-184, 112-113, 185-187</td>
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<tr>
<td><strong>MARCH 4</strong></td>
<td><strong>EXAM 1 (LECTURES 1-9)</strong></td>
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<tr>
<td>March 9</td>
<td>11. More Rosids</td>
<td></td>
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<tr>
<td>Lab 7*</td>
<td>Salicaceae, Betulaceae, <em>Acer</em></td>
<td></td>
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<tr>
<td>March 16</td>
<td>13. Angiosperm reproduction</td>
<td>125-129, 229-231, 160-165</td>
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<tr>
<td>March 18</td>
<td>14. Brassicaceae, Onagraceae, Fabaceae</td>
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<tr>
<td>March 23</td>
<td>15. Asteridae/Asteridae shrubs</td>
<td>77-81, 185-186, 190-192, 198-203</td>
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<tr>
<td>March 25</td>
<td>16. Special topic (Plant domestication?)</td>
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<tr>
<td><strong>Mar 30-Apr 3</strong></td>
<td><strong>SPRING BREAK</strong></td>
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<tr>
<td>April 6</td>
<td>17. Asterids II and review</td>
<td>218-224, 251-253, 265-269</td>
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<tr>
<td><strong>APRIL 8</strong></td>
<td><strong>EXAM 2 (LECTURES 10-16)</strong></td>
<td>218-224, 251-253, 265-269</td>
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<tr>
<td>April 13</td>
<td>18. More Asterids II</td>
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<tr>
<td>April 15</td>
<td>19. Asterids III</td>
<td>203-210, 193-197</td>
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<tr>
<td>April 20</td>
<td>20. Intro to monocots - Liliaceae</td>
<td>270-273 (skim allied families)</td>
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<tr>
<td>April 22</td>
<td>21. Orchidaceae and Iris</td>
<td>273-280, 293-297</td>
</tr>
<tr>
<td>Lab 12</td>
<td>Liliaceae, Orchidaceae, <em>Iris</em></td>
<td></td>
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<tr>
<td>April 27</td>
<td>22. Special topic (Invasive plants)</td>
<td>350-356</td>
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<tr>
<td>April 29</td>
<td>23. Grasses</td>
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<tr>
<td>May 4</td>
<td>24. Rushes and sedges</td>
<td>345-349</td>
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<tr>
<td>May 6</td>
<td>25. Overview</td>
<td></td>
</tr>
</tbody>
</table>
BIOO 335: PLANTS-TO-KNOW LIST (Spring 2015)
Families (-aceae) in **bold** and all listed genera (**bold italics**) are “plants-to-know”.

**NON-VASCULAR PLANTS**

Recognize mosses vs. other plants

**FERNS AND THEIR ALLIES**

Equisetaceae
Polypodiaceae
Lycopodiaceae

**GYMNOSPERMS (CONIFERS)**

Pinaceae
- *Abies*, *Larix*, *Picea*, *Pinus*, *Tsuga*
- *Pseudotsuga*

Cupressaceae
- *Juniperus*, *Thuja*

Taxaceae
- *Taxus*

**ANGIOSPERMS (FLOWERING PLANTS)**

**BASAL FAMILIES**
Nymphaeaceae

**EUDICOTS**

**BASAL EUDICOTS**
Ranunculaceae
- *Delphinium*, *Ranunculus*, *Aquilegia*

Berberis/Mahonia (Berberidaceae)

**CARYOPHYLLIDAE**
Caryophyllaceae
- *Silene*

Polygonaceae
- *Eriogonum*

Opuntia (Cactaceae)

Lewisia (Portulacaceae)

Chenopodium (Amaranthaceae)

**ROSIDAE**
Saxifragaceae
- *Lithophragma*

Onagraceae
- *Chamerion/Epilobium*

Brassicaceae
- *Sisymbrium*

Fabaceae
- *Lupinus*, *Vicia*

Rosaceae
- *Sorbus*, *Prunus*, *Rosa*, *Potentilla*

Salicaceae
- *Salix*, *Populus*

Betulaceae
- *Betula*, *Alnus*

Acer (Aceraceae)

Ribes (Grossulariaceae)

Viola (Violaceae)

**ASTERIDAE**
Ericaceae
- *Arctostaphylos*, *Vaccinium*

Solanaceae
- *Solanum*

Boraginaceae
- *Myosotis*

Scrophulariaceae (now 3+ families)
- *Castilleja*, *Mimulus*, *Penstemon*

Lamiaceae
- *Mentha*

Caprifoliaceae
- *Linnaea, Symphoricarpos*

Apiaceae
- *Lomatium*

Asteraceae
- *Artemesia, Balsamorhiza*, *Centaurea*

Cornus (Cornaceae)

Philadelphus (Hydrangaceae)

Dodecatheon (Primulaceae)

Phlox (Polemoniaceae)

**MONOCOTS**

**PETALLOID MONOCOTS**
Liliaceae
- *Erythronium*, *Fritillaria*

Orchidaceae
- *Calypso*

Iris (Iridaceae)

**GRASSLIKE MONOCOTS**
Poaceae
- *Agropyron*, *Festuca*

Cyperaceae
- *Carex*

Juncaceae
- *Juncus*

Optional materials:  
- hand lens (strongly recommended)  
- photo guide to Rocky Mountain plants  
- plant dissection kit  

(you can find all of the above at the Naturalist Mercantile and get a discount!)

**Student Expectations:**

- Lab time is used to:
  1. Learn how to "see" plants
  2. Understand how plants are organized
  3. Be able to recognize common taxa on sight
  4. Learn to use resources like dichotomous keys to identify unknown plants

  **So...**

  - **Arrive on time for lab**
  - **Come to lab prepared** by studying that week’s material
  - **Work in self-motivated** but collaborative fashion with other individuals! Study groups are HIGHLY recommended.
  - **Attend the full 2-hour session** and help in lab clean-up and reorganization at the close of lab.
  - Labs **cannot** be made-up before or after their scheduled week because each lab requires considerable and unique set-up. Therefore, do **NOT** MISS LAB. See me for exceptions.

**Grading:** Your grade in Rocky Mountain Flora will be determined as follows.

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st mid- term</td>
<td>100 pts</td>
</tr>
<tr>
<td>2nd mid-term</td>
<td>100 pts</td>
</tr>
<tr>
<td>Final exam</td>
<td>150 pts</td>
</tr>
</tbody>
</table>
| Lab quizzes              | 40 pts  
  (5 lab quizzes and you can drop your lowest score) |
| Plant collection         | 60 pts  |
| Lab notebook             | 26 pts  
  (up to 2 pts/class, drop your lowest score) |
| Lab final                | 24 pts  |
| **Total points**         | **500** |

1. **Lab quizzes.** 5 quizzes will be given at the start of lab meetings that cover our activities for that week. Weeks with quizzes are shown in the schedule below. Each quiz is worth **10 points.** Quizzes **cannot** be made up before or after their scheduled week unless specifically cleared with me BEFOREHAND and **IN WRITING.** No exceptions. We will drop your lowest quiz at the end of the semester.

   - **Plant collection.** I will give more detail on this later in the semester.
• **Lab notebook.** You will keep your notes from lab in a notebook or journal. In this notebook you are encouraged to draw, label, and record any observations that will help you identify the specimens covered in lab. You will hand in your notebooks at the end of the semester and I will award you 0, 1, or 2 pts per lab period based on the quality of your entries. **BE SURE TO PROVIDE THE DATE and LABSESSION (1-13) FOR EACH ENTRY!**

• **Lab Final.** A comprehensive final quiz will be given at the end of the semester over lab material. I will give more details on this later in the semester.

**Personal Notes:**

2. **IMPORTANT:** This is a memorization-intensive class. There’s lots of new vocabulary, lots of new information, and much of it is in foreign languages (Greek and Latin). There’s really no way around this: **YOU CAN’T SUCCEED IN THIS CLASS WITHOUT STUDYING and even BONDING with these plants.**

3. **DON’T LET MEMORIZATION DISCOURAGE YOU!** I want you all to have FUN and do WELL in the course. I will do everything I can to provide you the tools necessary for you to earn an A.

4. If you have any problems (e.g., schedule, concepts, memorizing), see me sooner rather than later. We’ve all been there, and it’s easier to resolve things early on. I am very reasonable/forgiving of conflicts discussed BEFOREHAND, but much less so after the fact.

5. I will give out and collect quizzes during the first 10ish minutes of class. If you arrive late, I’ll still give you a quiz, but I collect all quizzes at the same time, which means you may not have time to finish the quiz if you arrive late. Remember, there are no make-up quizzes (but see above).

6. **MAKE SURE YOUR EMAIL IS CURRENT ON MOODLE/CYBERBEAR!!** I often use email and/or Moodle to provide additional materials that will help explain concepts and make labs run more efficiently. It is your responsibility to make sure you receive these materials.

7. Regularly monitor your grades on Moodle. It is YOUR responsibility to alert me of potential issues. I readily own up to my mistakes and will be very accommodating if you demonstrate I’ve made one.

8. Cheating: please please please please please please please please please please please please please please please don’t do it.