FIELD BOTANY (BIOLOGY 2355)--2019

GENERAL INFORMATION

PERSONNEL

Instructor: Lynn Bohs, 228 & 203N South Biology, phone: 801-585-0380, e-mail: bohs@biology.utah.edu

Teaching assistant: Katie Sanbonmatsu, 232 South Biology, phone: 435-659-1197, e-mail: katie.sanbonmatsu@utah.edu

TIME AND PLACE

W F, 12:55-5:00 pm. Lectures start at 12:55 pm, and are in 230 James Talmage Building (JTB). Field trips depart either after lecture, or if there is no lecture for the day, field trips depart from behind the Skaggs Biology building (between Skaggs and the bookstore).

PURPOSE OF COURSE

The objective is to learn about plant biology by studying the local flora. You will develop skills in using technical botanical floras and the herbarium for identifying plants. Lectures provide the biological context of the habitats visited and plants observed.

TEXT


Copies are available for $50.00 (includes 6.8% sales tax) for purchase from the University of Utah Biology Department (checks payable to "U of U Biology Dept."). For those students who do not want to purchase the book, we have copies available for rent at $20 plus a $30 deposit refundable on return of the book in satisfactory condition at the end of the course (Cash, or checks payable to "U of U Biology Dept.").

LAB ROOM RESOURCES

We encourage you to use the lab room on your own time for identifying homework plants and the plants in your independent collection. For this purpose you will have ID card access to the lab room Monday through Friday. Extra copies of your textbooks will be available here as well as several CD programs installed on the computers to help with plant identification.

There will be some dissecting scopes available in the classroom for use in keying out plants. You will find these extremely useful for plant identification.
REQUIRED ITEMS

A field notebook is necessary for writing down the plants we see, and information about their morphology and habitat. You will also need paper and a writing implement for taking quizzes in the field. A pocket-sized loose-leaf type is recommended. These are available at the University Bookstore.

A clipboard is useful for holding your species lists and taking notes.

It is essential that you buy a 10X hand lens. These are available at the bookstore (ca. $7). You will need this to examine the often minute features of plants that are used to identify species.

Three sources of higher quality lenses are listed below:

BioQuip
www.bioquip.com
Phone: (310) 667-8800
Fax: (310) 667-8808
Recommended item: 10X Coddington Magnifier 1128B $29.75
10X Hastings triplet magnifier 1128E $47.55

Amateur Geologist
www.amateurgeologist.com
Phone: (760) 876-5427
Fax: (760) 876-5429
Recommended items: 10X Coddington Magnifier $29.70
14X Coddington Magnifier $32.49

Wards Biology Supply
www.wardsci.com
Phone: (800) 962-2660
Fax: (800) 635-8439
 Recommended item (Bausch & Lomb lenses):
10X Coddington Magnifier 251620 $45.00

FIELD TRIPS

There are 8 scheduled field trips during the Wednesday and Friday “lab” sessions. Wednesday trips will be shorter and usually will follow a lecture. Most Fridays there will be no lecture—just a field trip. All trips will take at least until 5 pm. On the last two trips we may be a little later in returning (approximately 5:30 PM). Transport will be provided (university vans). On bad weather days we will key out plants in the laboratory.
Come prepared with the following:

*hand lens, notebook and pencil
*handouts and species lists, clipboard
*sturdy boots or shoes for off-trail walking and snake protection
*sun hat
*sunscreen, lip balm
*pocket knife is useful
*raingear or shell if it’s threatening
*water
*insect repellent (essential for the west desert trip)
*daypack

Please be aware that these field trips come with the usual risks of travel and outdoor activities. These include sunburn, snake and insect bites, including bee and wasp stings, poison ivy (although rarely encountered), twisted ankles, dehydration, etc. We will be as prepared as possible against these risks, but can offer no guarantee that they will not happen.

The University requires that each student sign a waiver form indicating that you understand these risks.

INDEPENDENT PLANT COLLECTION

You will also compile an independent plant collection from one or more field trips taken on your own time. Visit areas that we have not seen in class trips and collect a total of 15 species of plants that are in flower and/or fruit. You will identify the plants and prepare an herbarium label for each one. The collection is due before the last field trip. More details will be forthcoming on this exercise.

GARRETT HERBARIUM

An “herbarium” is a library of pressed and identified plants. The Garrett Herbarium is located in the University of Utah Natural History Museum. You will take an orientation tour of this herbarium, and can use it at any time during the course. You will find it especially useful if you can’t identify a plant or if you want to confirm your identification. It is also useful if you are searching for a particular species and want to see what it looks like first. Mitch Power is the Director of the Herbarium and Elizabeth Johnson is the Collections Manager. Call 801-587-5745 for an appointment.

HANDOUTS

Handouts will be given during lecture and lab. The T.A. will have a set of extra handouts if you lose yours. The syllabus, handouts, homework, and other course-related items will be posted on the Canvas site assigned to this course and can be downloaded from there. Lecture notes will not be posted, so make sure you attend class.
TEST, QUIZZES, AND HOMEWORK

Each field trip will include a quiz. For most of these we will simply ask you to identify plants we have already learned.

Weekly homework will consist of unknown plants that you attempt to key out with your text. You can use classroom resources to help.

There will be a final “half open-book” exam covering material learned during the class. The exam will consist of two parts: 1) a “practicum” asking you to identify various plants or answer questions about them; 2) a section covering the biology of these plants as discussed in lecture and on field trips.

GRADING

Point assignments: Quizzes + Homeworks (8 field trips + 4 homeworks = 120 points). The lowest 2 quiz or homework scores will be dropped = 100 points total. Final Exam, 100 points. Independent collection, 75 points. Grades will be assigned using the 10-point scale as a guideline: 90-100% A, 80-90% B, etc. This scale may be lowered, but it will not be raised.

OTHER USEFUL RESOURCES

In addition to reserve copies of your textbook, several other botanical resources may be helpful in identifying plants from the Great Basin region. Some of these will be available in the lab room; others can be consulted in the Bohs lab (232 South Biology).

The Arnow et al. book only covers plants from Salt Lake and Davis Counties, and the Utah Flora only covers plants from Utah. If you want to identify plants from other areas in Utah or outside the state we have the Utah Flora in the classroom.


If you are floundering in an ocean of terminology, this book will help.

Hegji, Steve. 2010. *Wasatch wildflowers; a field guide.* CFI, Springville, UT.

Shaw, R.J. 1995. *Utah Wildflowers, a Field Guide to Northern and Central Mountains and Valleys.* USU Press, Logan, UT.

Pluses for both of these field guides: photographs of local wildflowers make an approximate identification easier. Minuses: only a portion of plants is covered and it cannot be used for precise identification. Sometimes at the U bookstore.

Excellent reference for weedy species, ca. $22.


Non-technical guide with photographs. Covers the west desert country flowers as well as some mountain flowers.


A great introduction to the natural history of the Great Basin with beautiful photographs.


An incredibly useful, authoritative, and comprehensive guide to the plants of the Intermountain West, including Utah and parts of surrounding states. Each species is accompanied by a line drawing.


Ditto for this multi-volume treatment, but it covers North America north of Mexico and usually has a single species illustrated per genus. A dozen or so volumes have been published thus far, with many others in the pipeline.

These are both fantastic resources, but pricey (several hundred dollars for the sets). If you would like to consult them, we have a set of these books in the Bohs lab (232 South Biology) and there is another set in the herbarium. Please leave the Bohs lab books in the lab room; they are expensive and we use them frequently in our research.

**WASATCH FLORA APP**

The Flora of the Wasatch application for iPhone, iPad, and Android by Steve Hegji and Whitney Tilt may be useful for you in the field. It contains photographs, descriptions, and a synoptic key (to search by characteristics) for over 300 species found in the Wasatch area. Please note that this does not include all the species found in the area; for that, you will need the Arnow et al. book (“green book”) or the Utah Flora. But this app will help to get you started with the most common or showy species. It is downloadable for $7.99 from High Country Apps through iTunes.
EXPECTED LEARNING OUTCOMES

Core Concepts for Biology
1) **Evolution** - Students will be able to apply the principles of natural selection and mechanisms of genetic change to explain the observed diversity of life that has arisen over long-term as well as recent evolutionary time frames.

2) **Structure and function** - Students will be able to apply knowledge organismal structures to explain the diverse set of functions that underlie the remarkable diversity of individual organisms as well as communities of organisms.

Core Competencies for Biology
1) **Ability to apply the process of science** – Students will be able to apply the process of science to identify knowledge gaps, formulate hypotheses, and test them against experimental and observational data to advance an understanding of the natural world.

2) **Ability to explain the relationship between science and society, and engage** – Students will be able to evaluate the interactions between biology and society and clearly communicate biological concepts and their implications to broad audiences.
## FIELD BOTANY 2355

### SCHEDULE

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<th>Date</th>
<th>Activities</th>
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| Wed., May 15 | **Lecture:** plant classification, vegetative morphology  
**Lab:** Campus walk on vegetative morphology, use of dichotomous keys. |
| Fri., May 17 | **Lecture:** floral morphology, characteristics of prominent plant families.  
**Lab:** Floral and fruit morphology and use of keys. Tour of Garrett Herbarium, UMNH. |
| Wed., May 22 | **Lecture:** Great Basin habitats  
**Field trip:** Red Butte Canyon—woody plants of riparian and foothill zones. |
| Fri., May 24 | **Field trip:** Skull Valley and Big Spring -- plants of the Great Basin Desert. |
| Wed., May 29 | **Lecture:** Halophytes and salt stress. Adaptations of plants to control temperature.  
**Field trip:** Foothills—forbs of the foothills. |
| Fri., May 31 | **Field trip:** Pinecrest, Emigration Canyon. |
| Wed., June 5 | **Lecture:** Montane vegetation zones.  
**Field trip:** Mill Creek Canyon (Terraces area)—midmontane forests and flowers. |
| Fri., June 7 | **Field trip:** Cardiff Fork, Big Cottonwood Canyon—upper montane zone. |
| Wed., June 12 | **Lecture:** Impact of humans on vegetation change in the Great Basin  
**Field trip:** Silver Lake, Big Cottonwood Canyon—sub-alpine zone, or Hidden Falls trail at S-curve—midmontane/upper montane transition. **Possible late return ca. 5:30 PM.** |
| Fri., June 14 | **Field trip:** Uinta Mountains. **Possible late return ca. 5:30 PM.**  
**PLANT COLLECTIONS DUE BEFORE FIELD TRIP** |
| Wed., June 19 | **Final exam (regular time in classroom)** |
NOTES: Lectures begin at 12:55 pm in the classroom (230 JTB). Field trips depart from behind the Skaggs Biology building (under the big ash tree). On days with no lecture, meet behind the Skaggs building at 12:55 instead of the classroom. Don’t be late! You may drive yourself if you wish, but we reserve the right to change destinations at the last minute depending on local weather patterns (only a problem for "iffy" weather days). When the weather is bad we will meet in the classroom and practice keying out plants inside.