

Biology 455, Spring 2015

Bryophyte and Lichen Biodiversity

Course Description: Introduction to the biology and ecology of mosses, liverworts, and lichens. Emphasis on identification and diversity of local representatives of these three groups of organisms. Required field trips and service-learning.

Required Texts:

- Brodo, I.M. et al. 2001. *Lichens of North America*. Yale University Press. New Haven
- Crum, H. 1991. *Liverworts and Hornworts of Southern Michigan*. University of Michigan Herbarium, Ann Arbor
- Crum, H. 2004. *Mosses of the Great Lakes Forest*. University of Michigan Herbarium, Ann Arbor
- Kimmerer, R. W. 2003. *Gathering Moss: A Natural and Cultural History of Mosses*. Oregon State University Press. Corvallis.

Learning Objectives: Upon completion of 455/555, a student should be able to:

- 1) Recognize common genera and species of mosses, liverworts, and lichens on sight
- 2) Know enough about the structural features of mosses, liverworts, and lichens to be able to use dichotomous keys to identify these organisms
- 3) Understand the value, importance, and use of herbarium collections to studies of mosses, liverworts, and lichens
- 4) Gain an appreciation for some of the ecological roles of mosses, liverworts, and lichens

Service-Learning Component: All collected specimens that are confidently identified will be prepared for accession into the ISU Ada Hayden Herbarium, improving the collection for future researchers.

Assessment and Grades: There will be a total of 100 points in this class, with the opportunity to earn 3 “extra credit” points. These points will be distributed in the following way:

1. **Attendance (28 points).** There are a total of 28 times that this class will meet (excluding the competence exam [and field trips]). Attendance at each class will be worth 1 point.
2. **Competency Exam (25 points).** Percentage score on the exam will be scaled to 25 total points. Exam will be “practical” and will be open-book, open-note, and open-internet.
3. **In-class Discussions (5 points).** These points will be assigned, based on the judgment of the instructor, for “active participation” in the in-class discussions and for posting on BlackBoard, prior to class, written comments about the assigned readings from the Kimmerer book. Written comments should include: 1) One quotation (1-2 sentences, with page number cited) that you found particularly interesting; and 2) One question that the reading raised in your mind.
4. **Field Trip (12 points).** Each student is expected to participate in at least one of the two scheduled field trips.
5. **Biodiversity Inventory Project (30 points).** 15 points will be assigned, based on the judgment of the instructor, for “active and positive contribution” to the identification of collected specimens; 10 points will be assigned for “active and positive contribution” to the final oral report; 5 points will be assigned for submission of an acceptable paper reflecting on the biodiversity inventory project.
6. **Extra Credit Opportunity (3 points).** Participation in both field trips will be rewarded with 3 “extra credit” points.

Therefore, each student has 103 chances to earn a perfect score (100 points) in this class. There will be no “make-ups” for missed in-class work. That is part of the reason for providing an extra credit opportunity. Grades will be assigned using the “standard curve”:

A-range 90-100

B-range 80-89

C-range 70-79

D-range 60-69

F 59 and lower

Depending on the class average at the end of the semester, this grading curve may be lowered, but will not be raised. This means, for example, that a score of 90 will not be assigned a B-range grade, even if that was the lowest score in the class

Grading for students taking EEOB 555: All of the requirements listed above will be in place. In addition, students taking this class as EEOB 555 will be required to read selected primary research literature on bryophytes and/or lichens and give a 15 minute presentation on the topic they’ve studied during one class period. This activity will be worth 20 points. Students taking EEOB 555 will have their grade calculated as a percent of 120 points. So, for example, if such a student earned a total of 105 points (including “extra credit”), their % score would be 87.5 and they would earn a B-range grade, unless the grading curve had been lowered.

Useful Web Resources:

Bryophyte Flora of North America. An “in progress” reference work on bryophytes (<http://www.mobot.org/plantscience/bfna/bfnamenu.htm>)

Wisconsin Bryophytes (<http://wisplants.uwsp.edu/Bryophytes/index.html>)

Bryophyte Ecology (<http://www.bryoecol.mtu.edu/>)

Bryophyte Glossary (<http://www.mobot.org/MOBOT/tropicos/most/Glossary/glosefr.html>)

Liverworts (<http://bryophytes.plant.siu.edu/liverimage.html>)

Lichen Images (http://www.sharnoffphotos.com/lichens/lichens_home_index.html)

(<http://www.waysofenlichenment.net/lichens/>)

Wisconsin Lichens (<http://www.botany.wisc.edu/wislichens/>)

Lichen Name Checklist (<http://www.ndsu.edu/pubweb/~esslinge/chcklst/chcklst7.htm>)

Lichen Glossary (<http://csdept.umfk.maine.edu/LichensWebsite/glossary.asp>)

Lichen Identification (<http://www.huh.harvard.edu/collections/lichens/guide/guidetoliterature.html>)

Non-Discrimination Policy: Iowa State University is “dedicated to fostering an environment in which differences in people such as nationality, race, gender, religion, cultural background, physical ability, and sexual orientation, are respected and mutual understanding is promoted.” (from the ISU Bulletin)

Students with Disabilities: Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. All students requesting accommodations are required to meet with staff in Student Disability Resources (SDR) to establish eligibility. A Student Academic Accommodation Request (SAAR) form will be provided to eligible students. The provision of reasonable accommodations in this course will be arranged after timely delivery of the SAAR form to the instructor. Students are encouraged to deliver completed SAAR forms as early in the semester as possible. SDR, a unit in the Dean of Students Office, is located in room 1076, Student Services Building or online at www.dso.iastate.edu/dr/. Contact SDR by e-mail at disabilityresources@iastate.edu or by phone at 515-294-7220 for additional information.

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Course Schedule

<u>Date</u>	<u>Activity</u>
Jan 12	Introduction to the Course; Lab Intro pt. 1; Intro to Liverworts
Jan 15	Intro to Liverworts; Lab Intro pt. 2; Exploring Liverwort Diversity
Jan 19	No Class – due to MLK Holiday
Jan 22	Exploring Liverwort Diversity
Jan 26	Exploring Liverwort Diversity
Jan 29	Intro to Mosses; Exploring Moss Diversity
Feb 2	Exploring Moss Diversity
Feb 5	Exploring Moss Diversity
Feb 9	Intro to bryophyte keys; Intro to Lichens
Feb 12	Exploring Lichen Diversity
Feb 16	Exploring Lichen Diversity
Feb 19	Exploring Lichen Diversity; Intro to lichen keys
Feb 23	Inventory Project Introduction; Bryophyte and Lichen Features Review
Feb 26	Competency Exam
Sunday 1 March Field Trip	
Mar 2	Herbarium Introduction; Biodiversity Inventory
Mar 5	<i>The advantages of being small*</i> ; Biodiversity Inventory
Saturday 7 March Field Trip	
Mar 9	<i>An Affinity for Water*</i> ; Biodiversity Inventory
Mar 12	<i>Choices*</i> ; Biodiversity Inventory
Mar 15	Spring Break
Mar 19	Spring Break
Mar 23	<i>Sexual Asymmetry and the Satellite Sisters*</i> ; Biodiversity Inventory
Mar 26	<i>A Landscape of Chance *</i> ; Biodiversity Inventory
Saturday 28 March Field Trip (Alternate Field Trip Date)	
Mar 30	Biodiversity Inventory
Apr 2	Biodiversity Inventory
Apr 6	Biodiversity Inventory
Apr 9	Biodiversity Inventory
Apr 13	Biodiversity Inventory
Apr 16	Biodiversity Inventory
Apr 20	Oral Report Preparation
Apr 23	Oral Report Preparation
Apr 27	Oral Report Preparation
Apr 30	Presentation of Lichen/Bryophyte Biodiversity Inventory
May 4-8	Finals Week Required Meeting (TBA)

* Chapters From: *Gathering Moss: A Natural and Cultural History of Mosses* by RW Kimmerer. Written comments due on BlackBoard PRIOR to class.