

Natural History of the Great Smoky Mountains

Mini-session 2017

Instructors:

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Office Hours: T&Th 12:00pm-1:00pm or by appointment

Course Information:

EEB 461: Special Topics in Organismal Biology
3 credits Lecture/Laboratory/Discussion/Field Trips
MTWTF, TBA

Course Description: This course is a field ecology course that includes a one-week field trip. Students will learn about the natural history and ecological and evolutionary factors that are responsible for the diversity of plants and animals in the Great Smoky Mountains. Emphasis is on field study of selected biotic communities. The course will meet daily on campus for lectures/labs for 5 days (week 1) before the venturing into the field. Students will stay full-time at the Biology Field Station in week 2. The course will conclude with 2 days (Week 3) of oral presentations and discussion. A course fee of \$300/student is required. Lecture/Recitation/Laboratory/Field Trips.

Prerequisites: Biology 150; Biology 250; Biology 280; and the consent of one of the instructors. Students must have prior authorization of the instructor(s) to register for this course.

Course Objectives:

By the end of this course students will be able to:

- a. interpret specific plant and animal traits as adaptations to the habitats of the Southern Appalachian Region;
- b. describe and analyze how climate affects ecosystems;
- c. evaluate how climatic effects on ecosystems determine the distribution and makeup of the different plant communities of the region;
- d. present information, in oral and written form, on topics assigned in class;
- e. evaluate the environmental impacts of a variety of human activities;
- f. understand the proper use of a variety of ecological field techniques;
- g. identify the major plant species involved in defining the various plant communities;
- h. define and explain various community interactions including specific competition, predation, and symbiotic relationships of the region studied;
- j. identify characteristic species of the field site and demonstrate knowledge of their life history patterns.

Texts:

Linzey, D. W. 2008. A Natural History Guide to Great Smoky Mountains National Park. Knoxville, TN: Univ. of Tennessee Press.

A Field Guide to Eastern Forests, 1st edition, John Kricher 1998.

A Walk in the Woods, 1st edition, Bill Bryson, 2006 (optional)

Course Requirements:

1. Your cell phone/i-pad/computer must be put away and turned off during this class!
2. The instructor reserves the right to adjust this schedule when appropriate or necessary.
3. Your presence is expected for every lecture, laboratory and field trip (i.e. attendance is required). Make-up exams are given at the discretion of the instructor. You must contact one of the instructors prior to the end of the exam period to be eligible for a make-up exam. Lab make-ups may not be easy to arrange. In that case an alternate assignment will be assigned. The final grade for the course will not be released until all assignments are turned in.
4. Disasters notwithstanding, you are expected to make every effort to arrive for class on time (i.e. punctuality is required). Lab quizzes are given at the beginning of class and no makeup will be allowed without prior consent of the instructor.
5. It is expected that you will read your text before you come to class.
6. Plan on taking extensive field notes.
7. You are required to:
 - a. bring a notebook and writing utensils to all labs
 - b. maintain a detailed field notebook to document the fieldwork
 - c. be responsible for your own actions or lack of them

Exams: The lecture quizzes and final exam are written exams and will consist of short answer and essay questions. The two practical exams will be on the identification of the major plants and identification of the salamanders and snakes of the smokies. **There will be no makeup exams allowed without prior consent of the instructor.** I require notice at least before the end of an exam period if you need to makeup an exam.

Grade Basis

Week 1 lecture quiz 10%
 Final exam (week 3) 20%
 Laboratory (2 practical field exams, week 2) 20%
 Field notebook 20%
 Field participation 20%
 Oral Presentation (week 3) 10%

Week 1:

Day 1. Introduction to the Smoky Mountains. Geological and Human History and Physical Environment K1, 2 (B1-5)

K6 pp270-281

Day 2. The Plant Communities (B6-10)

- a. Spruce-Fir Forests K3 pp 58-70, 75-77
- b. Grass Balds K3 pp 102-103
- c. Heath Balds K3 pp 102-103
- d. Northern Hardwood Forests K3 pp 72-75
- e. Closed Oak Forests K3 pp 81-85
- f. Open Oak-Pine Forests K3 pp 90-95
- g. Hemlock Forests
- h. Cove Hardwood Forests K3 pp 98-102
- i. Lowland Stream Bank Forests

Day 3. Plant Identification. UT Herbarium Collection

- a. Vascular plants
- b. Bryophytes
- c. Fungi

Day 4. Selected Vertebrates of the Smokies (B11-15)

- a. Mammals: Bats, Bears, Elk, Red Wolves
- b. Salamanders K6 pp281-294
- c. Snakes K6 pp374-382
- d. Chars and Trout

Day 5. Non-Native Invasive Species K4, (B16-21)

- a. Chestnut Blight Fungus
- b. Balsam Woolly Adelgids
- c. Hemlock Woolly Adelgids
- d. Kudzu
- e. White-nose syndrome
- f. European Boars

Week 1, Lecture/Lab Quiz.

Week 2. Field-based lab/practicum/discussion

Field Trip:

A one-week field trip to Great Smoky Mountains National Park. The base camp will be at UT's Biology Field Station adjacent to the Greenbrier Entrance to Great Smoky Mountains National Park, Tennessee. Fieldwork will consist of the identification of the dominant species of plants and animals along a variety of hiking trails. Familiarizing with plant communities and habitats and behaviors of the different species of mammals, birds, salamanders and reptiles identified in the field. Students will live in a community environment and should expect to be in the field after dark and in inclement weather, as needed.

Week 2. Field Exams, evaluation of field notes and participation on site at field station

Plant Identification

Animal Identification

Acoustic analysis

Orienteering in the mountains: The proper use of a compass and topographical maps.

Week 3. Final Exam, and oral presentations.

Bibliography:

Brown, Claus L. and Kirkman, L. Katherine, *Trees of Georgia and Adjacent States 1st ed.*, Timber Press, Portland, OR, 2000

Conant, Roger and Collins, Joseph T., *A Field guide to Reptiles and Amphibians: Eastern and Central North America 3rd ed.*, Houghton Mifflin, Boston, MA., 1998

Kavanagh, James, *Great Smoky Mountains Trees & Wildflowers: An introduction to over 140 familiar species of trees, shrubs and wildflowers 1st ed.*, Waterford Press, Phoenix AZ, 2008

Baumgardt, John P., *How to Identify Flowering Plant Families 1st ed.*, Timber Press, Portland, OR, 1994

Bryson, Bill, *A Walk in the Woods 1st ed.*, Goadway Books, New York, NY, 1998

Bush, Mark B., *Ecology of a Changing Planet 3rd ed.*, Benjamin Cummings, Pearson, Upper Saddle River, NJ, 2002

Campbell, Carlos C., Sharp, Aaron J., Hutson, Robert W., and Hutson, William F., *Great Smoky Mountains Wildflowers: When & Where to Find Them 5th ed.*, Windy Pines Publishers, Northbrook, IL, 1996

Houk, Rose and Collier, Michael, *Great Smoky Mountains: A Natural History Guide 1st ed.*, Houghton Mifflin, Boston, MA, 1993

Kershner, Bruce and Leverett, Robert, T., *The Sierra Club Guide to the Ancient Forests of the Northeast*, Sierra Club Books, San Francisco, CA, 2004 *

Linzey, D. W. 2008. A Natural History Guide to Great Smoky Mountains National Park.
Knoxville, TN: Univ. of Tennessee Press.
Southwood, Richard and Henderson, P. A., *Ecological Methods, 3rd ed.*, Blackwell Publishing Limited,
Oxford, UK, 2000
Tilley, Stephen G., *Reptiles and Amphibians of the Smokies 1st ed.*, Great Smoky Mountains Natural
History Association, Gatlinburg, TN, 2001

d. Relevant Periodical Sources:

American Scientist Journal of Herpetology
Copeia Journal of Wildlife Management
Ecology Nature
Evolution The American Naturalist
Herpetologica Trends in Ecology and Evolution
Herpetological Review
Annual Review of Ecology, Evolution and Systematics
Bulletin of the American Museum of Natural History