SYLLABUS · SUMMER 2027 · HIGHLANDS BIOLOGICAL STATION

Forest Ecosystems
of the Southern Appalachians

WHEN	WHERE	INSTRUCTORS
July 12–23, 2027 Two weeks, with three nights away	Highlands Biological Station and field sites across the region	Stephanie Jeffries · Alan Weakley · Julie Tuttle

About the *course*

This course will teach students how to read the forested landscapes of the southern Appalachian Mountains. Understanding the patterns and processes in forested ecosystems will require students to focus on vegetation, with an emphasis on natural communities.

We'll introduce topics such as biogeography, paleo-ecology, classification of vegetation, regional environmental patterns, succession and community dynamics, vegetation-environment relationships, and current threats to the integrity of these systems across a variety of field sites, which will take us on two multi-day field trips away from the Station. We expect students to actively immerse themselves in the fascinating ecology of the southern Appalachian Mountains, through their enthusiastic participation, keen observation, and careful field notes.

Students participate in group activities, including field excursions and discussions, and they maintain personal field journals summarizing the information presented. The course grade is based on evaluation of the personal journal, a written final examination, and short in-class exercises assigned by the instructors.

> **Important:** before participating in this course, please be sure you have read and are comfortable with the information in the sections on **Expenses** and **Physical demands of the course**.

Course *structure*

Forest Ecosystems will not be a typical lecture course. Rather, you should think of the course more as a symposium on wheels, with much of the instruction happening in the field or during discussions at other times. There will be only a few formal lectures; most of these will be on the first day of class. The remainder of the course will focus on a series of topics or themes (see below), which will be referenced and discussed at appropriate times during the field excursions. For example, instead of a single lecture on succession, you are likely to participate in discussions of succession several times during the course.

Each discussion will be led by a different instructor and will occur in a different setting, which will provide the perspectives of different scientists (including yourselves) on each topic. Topics will also be presented in settings most appropriate to their discussion (e.g., when examples are close at hand in the field) and in the context of other related topics being discussed (e.g., succession and biological diversity may be discussed together, rather than in separate lectures). While the highly contextual nature of this course will benefit all of

us, this course format also puts more responsibility on you to create your personal synthesis of a given topic! We will facilitate this process with occasional discussions for review and reflection.

FOCAL TOPICS

We will consider a number of focal topics throughout the course. These may include, but are not limited to:

- vegetation-environment relationships
- adaptations of species
- community types and their classification; guilds and community organization
- succession and stand development
- biodiversity
- disturbance regimes and community dynamics
- special habitats and species
- recent human disturbance history
- ecosystem function
- paleoecology
- regional variation in composition
- biogeography
- threats to integrity of natural ecosystems

GRADING

Participation (engagement, expert topic assignment, field exercises, discussions)	20%
Field notebook	40%
Final exam	**40%**

Students who plan to earn college credit can earn undergraduate or graduate credits through either UNC or Western Carolina, and Continuing Education Units and Environmental Education (EE) credits are also available. Please contact the Highlands Biological Station for more information.

Brief *itinerary*

MONDAY July 12	DAY 1	Introductory lectures; field excursion to Whiteside Mountain *Overnight at HBS*
TUESDAY July 13	DAY 2	Field excursion to Great Smoky Mountains, emphasis on Smokies overview and high-elevation systems *Overnight at UT-Knoxville field station*
WEDNESDAY July 14	DAY 3	Field excursion to Great Smoky Mountains, emphasis on 2016 wildfire, low-elevation systems, and elevation transect *Overnight at UT-Knoxville field station*
THURSDAY July 15	DAY 4	Field excursion to Foothills Parkway and Joyce Kilmer Memorial Forest *Overnight at HBS*
FRIDAY July 16	DAY 5	Field excursion to Satulah Mountain and Dulany Bog *Overnight at HBS*
SATURDAY July 17	DAY 6	Field excursion to Buck Creek and Dry Falls *Overnight at HBS*

SUNDAY July 18	DAY 7	Day off! Rest and laundry.
MONDAY July 19	DAY 8	Field excursion to Roan Massif *Overnight at Mars Hill University*
TUESDAY July 20	DAY 9	Field excursion to Balsam Mountains and Blue Ridge Parkway, section between Asheville and Balsam Gap *Overnight at HBS*
WEDNESDAY July 21	DAY 10	Field excursion to Panthertown Valley *Overnight at HBS*
THURSDAY July 22	DAY 11	Field excursion to Scaly Mountain; review, final discussions, study time *Overnight at HBS*
FRIDAY July 23	DAY 12	Final examination and course evaluations; wrap-up by noon

Preparation for the *course*

As you pack for the course, please keep in mind the agenda above and our daily program, which will typically involve considerable driving and extended hikes. For the hikes, you'll need comfortable and sturdy footwear (light hiking boots are the best bet, but don't try to break in a new pair during the course). Weather will most likely vary from hot and steamy to cold and rainy, and from delightful to atrocious. Reliable rain gear is essential—poncho or parka and rain pants—as is a lightweight wool sweater or synthetic fleece for extra warmth (we will visit high-elevation sites, and Highlands sits at 4,400 ft).

Keep in mind that we'll also spend three nights off-campus. This means that you should bring a small (easily packed) overnight bag and any essentials that you'll need for the nights away from the Station. The overnight facilities are inexpensive, but will require that we bring our own sleeping bags, sleeping pad, and towels. On most days, you should be prepared to make a lunch to bring with you. You'll also need a water bottle (or two) and any snacks that will keep you going on long days on the road and in the field. Finally, you'll need a light day pack for carrying your gear during hikes.

Expenses

There are inevitable costs associated with an undertaking of this nature. We have endeavored to keep these to a minimum, but you must be prepared to cover two nights (July 13 and 14) of lodging at the UT-Knoxville field station at Greenbrier, and one night (July 19) of lodging at Mars Hill University. All lodging fees (the total will be $77) will be collected by the Station in advance.

In addition to the housing costs noted above, you must be prepared to pay for dinner at restaurants on the nights of July 13, 14, 15, and 19, as well as breakfasts on July 14 and 15. Total cost of these off-campus meals will be at least $100. We will spend a lot of time on the road and trail, so you will want to have additional cash on hand to buy snacks, sodas, etc., unless you bring your own from home.

You may prepare other meals and field lunches at the Highlands Biological Station, which has kitchen facilities. There are two grocery stores in town and of course you may bring food from home. We will have a cooler that can be used for field lunches, but space is limited.

Books and the field *notebook*

TEXTBOOKS

There are no required textbooks, but you might find these books and publications helpful:

1. Jeffries, S.B. and T.R. Wentworth. 2014. *Exploring Southern Appalachian Forests.* Chapel Hill: UNC Press. The Forest Ecosystems course inspired this book! It's an ecological hiking guide and covers many of the trails we will do in class.
2. Spira, T. 2011. *Wildflowers and Plant Communities of the Southern Appalachian Mountains and Piedmont.* Chapel Hill: UNC Press. A beautifully photographed field guide to plant communities that would be a great companion book for the course.
3. Schafale, M.P. *Classification of the Natural Communities of North Carolina (Fourth Approximation).* North Carolina Natural Heritage Program, Raleigh, NC. Available from ncnhp.org.

FIELD NOTEBOOK

The most important piece of equipment you'll need to bring is a field notebook, dedicated to this course. A plastic-bound, 5 in. × 8 in. surveyor's notebook with waterproof paper is best, small enough to pack easily. You can order an 80-page, horizontal-lined, poly-bound "Rite in the Rain"® notebook from Forestry Suppliers or Amazon (see below). The cost for these notebooks is about $23, plus shipping. Also bring 2–3 reliable pencils for writing. You'll be expected to maintain this notebook with your observations from our field excursions and discussions, and you will be required to submit this notebook to the instructors for grading on the last day of the course.

Two critical features your notebook must have: 1) it must have waterproof paper (trust us), and 2) it must be at least 80 pages. Former students suggest colored pencils to help with organization and annotation. Some students found that they needed an additional notebook.

Where to order (390F is the lined journal style, but that's personal preference): Forestry Suppliers, item #49495, 1-800-647-5368; or Amazon, search "Rite in the Rain bound book 390."

Checklist for *packing*

- light day pack
- overnight bag
- comfortable hiking boots
- comfortable shoes/sandals for use when not hiking
- old sneakers you can trash or rubber boots for bogging
- sweater, pullover, etc. for cool weather
- rain gear (poncho or rain jacket and pants)
- sleeping bag and pillow (strongly recommend a sleeping pad for the UTK field station)
- flashlight
- canteen(s) or water bottle(s), 2 quarts minimum
- several changes of clothing
- towels, soap, personal toiletries, medications (please let instructors know if you carry an epi-pen and where it is located in your pack)
- 80-page water-resistant surveyor's field notebook and pencils
- food for personal meals, field lunches, and snacks at Highlands Biological Station (there are two small grocery stores in Highlands for resupplying)
- personal snacks for the road and field
- miscellany: camera, binoculars, hat, sunscreen, sunglasses, swimsuit, field guides, books, musical instrument, etc.

Physical demands of the *course*

By its very nature, this course involves considerable hiking en route to many of our destinations. In most cases we will be on trails, but we will occasionally be off-trail as well. All participants must be in sufficiently good physical condition to undertake moderately strenuous hikes of several miles' duration during each day of the course. If you have any questions about your physical ability to participate in this course, please contact one of the instructors!

Highlands Biological Station · 265 N. Sixth Street, Highlands, NC 28741 Schedule subject to change with weather and conditions.