**Biology 555L: Laboratory in Paleobotany**

**Lab meets Thursday, 1:30-4:20 PM, 140 Wilson, unless otherwise indicated**

**Overview:**

* There is one three-hour lab period per week.
* The lab exercises are designed provide direct experience in preparation, analysis and identification of plant fossils.
* Purchase a course pack for Biology 555 Laboratory from Student Stores, as it provides important and necessary guidance for lab exercises.
* Read the material about a given lab **prior** to coming to lab.
* Integrate what you learn in lecture with that you learn in lab.

**Field Trips:**

There are up to 3 required field trips to collect fossils. One will be a day trip to Virginia, to sample Lower Carboniferous localities. The second is to the Triassic deposits near Sanford, NC, where a variety of plants can be found. Both will be part of a weekend. A third and/or alternative trip will be a day trip to the North Carolina Museum of Natural Science to look at several aspects of fossil collections, museum curation and use of fossils as educational materials.

These field trips will be on weekends. Dates of the trips are to be determined (we will discuss possible weekends in Lecture at the beginning of the semester).

These trips will provide important insight into aspects of paleobotany and we will use materials collected to practice techniques and analyses. A summary of two of these experiences will be required and graded at 15 points each for a total of 30 points. Details will be given at or before the time of each trip. Trips requiring a summary reflection are to be determined.

**Quizzes, Tests, and Grading:**

There will be 5 lab quizzes, worth 12 pts each, which will be given **once every two weeks** on the previous **two labs**, for a total of 60 points. The lab final (25 points) will be given the last day of lab. Your final lab grade will be based on the number of points earned out of 115. A letter grade will be based on the following **approximate** scale:

A= 90-100%, B= 80-90%, C= 70-80%, D= 60-70%, F= < 60 %.

**Procedure:**

Distinctive to paleontology is that quite often only a single specimen, or a very few specimens, of a fossil plant or animal are found or are available for your study. One cannot always collect what one wants, nor can very much be ordered from biological supply houses. Some specimens are obtained by exchange. Often, we will have to use images from papers extensively, especially reconstructions. When both are available, you will want to consider how well the images reflect what the specimens show. Image collections on the internet are increasing and can aid in supplementing individual collections; however, quality of image and accuracy in identification varies. Look for some of these. The UCMP Berkeley website, including the Paleontology Portal, is an excellent resource: <http://www.ucmp.berkeley.edu/exhibits/index.php>.

**BEWARE OF MIS-IDENTIFIED FOSSILS ON THE INTERNET**.

When sketches or diagrams are called for (and you should **always** make a record of what you have observed in lab), always record whatever information is available concerning the following:

* The classification of the fossil plant
* The geographical and geological origin, plus its age in terms of geological time.
* **Make drawings**, preferably on unlined paper. These will help you evaluate critically. The lab manual is designed so you can include drawings on the page opposite of the text.
* Feel free to take pictures of the specimens as well; however, this **should not** be used as a substitute for drawing specimens. Drawing specimens allows for more critical analysis.

Appropriate specialized literature will be available in the lab that illustrates or interprets the plants being studied. Use these in conjunction with your study of the specimens to obtain as much information about them as possible and record such references in your lab notes. Unless otherwise indicated you do not have to read them completely but should look at the parts indicated.

Even though several specimens of a particular plant may be available for study they will often reveal different aspects of it. Observe several specimens if they are available and collaborate freely with your fellow students during lab.

Lab materials will be placed in the large oak cabinet in 140 Wilson upon completion of labs and thus will be available for review for one to two weeks. If they have to be put away, arrangements can be made for access to the collections before lab quizzes. I encourage you to bring your computers to lab (and class if you want).

This is intended as an approximate guide to the laboratory studies. Other materials may be introduced when it seems appropriate to do so and some that are noted may be deleted. More detailed instructions will be given at the start of each lab period.

A resource for techniques: Jones, T. P. and N. P. Rowe. 1999. *Fossil Plants and Spores: modern techniques.* The Geological Society, London.

**Lab Schedule\***

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| Class Date  (All Thursdays) | Lab Topic |
| Aug. 22 | Lab 1: Introduction to living groups of plants, preservation types, and preparation techniques for fossils |
| Aug. 29 | Lab 2: Overview of basic plant structures and plant groups |
| Sep. 5 | **Quiz 1**  Finish Lab 2  Lab 3a: Precambrian Organisms  Lab 3b: Fossil Spores and Pollen |
| Sep. 12 | Lab 4: Ordovician to Early Devonian Plants |
| Sep. 19 | **Quiz 2**  Lab 5: Lycopsid Evolution |
| Sep. 26 | Lab 6: Early to Middle Devonian plants with different architectures  Lab 7: Sphenopsids |
| Oct. 3 | **Quiz 3**  Lab 8: Ferns |
| Oct. 10 | Lab 9: Progymnosperms and earliest ovules |
| Oct. 17 | **Fall Break – No Lab** |
| Oct. 24 | **Quiz 4**  Lab 10: Lyginopterids, Medullosans, and Callistophytes |
| Oct. 31 | Lab 11: Fossil Cycadophytes  Lab 13: Other Mesozoic Seed Plants |
| Nov. 7 | **Quiz 5**  Lab 12: Early Coniferalean Gymnosperms: Cordaites and Conifers |
| Nov. 14 | Lab 14: Angiosperm features – Leaves and Pollen  Lab 15: Angiosperm Evolution; Tertiary Floras and Climates |
| Nov. 21 | **Lab Final** |
| Nov. 28 | **Thanksgiving Break – No Lab** |