

Syllabus

Instructor: Ross Alexander Office: Bannister 3rd Floor email: alexanderm10@email.arizona.edu

General laboratory format:

Time: Tuesday 2-5pm, BBTRB room 110.

Students are expected to be in lab promptly at 2 PM so we can go over the session objectives, hand out material, and answer questions as a group during the first 20-30 minutes.

We will try to pace the class so all students are working on the same set of material at roughly the same time. **Students are expected to attend class so they do not fall behind.** The material is ordered so that the experience gained is cumulative - solving the first exercise helps with the second, etc.

We will have 14 regular lab sessions and a lab practical exam. **IMPORTANT NOTE: There will be a final practical exam held on Tuesday Dec 6th during the scheduled lab time.**

Introduction to wood and crossdating

The goal of the lab is to learn the procedure to accurately determine the year of annual ring formation of tree-ring samples (i.e., crossdating). This is the foundation of dendrochronology.

The lab class will begin with an overview of wood characteristics, suitability for dendrochronology, and an introduction to the skeleton plotting method of crossdating. Students are encouraged to utilize Dr. Paul Sheppard's SkeletonPlot program for practicing this technique.

This program can be accessed online at:

<http://www.ltrr.arizona.edu/skeletonplot/SkeletonPlot19.htm>

The introductory and explanatory material for skeleton plotting can be found here:

<http://www.ltrr.arizona.edu/skeletonplot/introcrossdate.htm>

Lab exercises will begin by learning how to “**skeleton plot**” and “**crossdate**” a paper representation of a section of bristlecone pine (*Pinus longaeva*), which are the oldest known living trees in the world. The skeleton plots will be **crossdated** against a **master chronology** provided. The paper exercise is due at the beginning of the 2nd lab session (**10 points**).

Chronology building exercise

This exercise is designed to provide a practical experience in crossdating and chronology building based on wood specimens from a site in the Zuni Mountains of northwestern New Mexico. The samples are from trees of six species found in the mixed-conifer forest that dominates sites between 8,000 and 9,000' elevation: Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), piñon pine

(*Pinus edulis*), quaking aspen (*Populus tremuloides*), Gambel oak (*Quercus gambelii*), Rocky Mountain juniper (*Juniperus scopulorum*). **(160 points)**

Procedure:

The assignment consists of: (1) making skeleton plots of a minimum of **two radii** from all samples; (2) using a logical procedure to construct a skeleton plot composite master chronology from the individual plots. This procedure consists of starting with the younger and least problematic trees with a known outer ring date, e.g. 1998, and adding in older trees and those that the date of the last ring is unknown one at a time by pattern matching.

Each student will be provided with a set of wood sections to begin the exercise. Keep these and your skeleton plots in your box. When you have completed dating a specimen have the instructor check it.

Fill out the data sheet with the information for each specimen as you complete them (ID, inside and outside date, and comments where appropriate regarding problems or features of interest).

Count carefully, mark clearly and lightly with a #2 pencil (no mechanical pencils PLEASE), and ask questions if you are unsure about a ring. We will try to resolve at least some of these questions as a group, using the microscope/video projector.

Mounting and surfacing cores from the field trip

We will prepare, mount and surface, and date the increment cores collected on the field trip. **(20 points)**

Applications and additional species

If time allows, we will explore some applications of dendrochronology by dating fire scars and archaeological specimens, and look at wood from additional species that have been used extensively in dendrochronology studies, or other applications of interest to the student that are approved in advance by the instructors.

Practical Exam

We will have a practical laboratory exam on the last day of class or during the scheduled final exam time **(70 points)**. We will have a review and practice exam around the time of the lecture mid-term exam.

IMPORTANT NOTE: The exam is scheduled for Tuesday Dec. 6th 2-5 PM.

Grading

Lab exercises total: 190 points

Laboratory Exam: 70 points

A link to this syllabus can be found online at: <http://www.ltrr.arizona.edu/introdendro/>