

COURSE OUTLINE
FORS 342--WOOD ANATOMY, PROPERTIES AND IDENTIFICATION
3 Credits

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Schedule: Lecture: Tuesday and Thursday, 12:10-2:00 pm, 301 Forestry. One 6-hour session (likely a Friday or Saturday) at the Wood Science Laboratory sawmills at Lubrecht Forest for felling and processing the trees that will yield mechanical properties specimens, and two 3-hour sessions in the preparation and testing labs for manufacture and mechanical testing of specimens.

Laboratory: Thursday, 12:10-2:00 pm plus one or two all-day laboratory sessions at Lubrecht Forest and Wood Science Laboratory for selecting, felling and sawing a tree into test specimens for mechanical testing, and one 3-hour lab for destructive testing of green, clear wood specimens taken from the trees.

Required Text: Course Pack from Burke

Suggested Texts: You have an excellent set of keys and micrographs for your use in the course pack. *Understanding Wood* by Hoadley and *Identifying Wood* by Hoadley. Both by Taunton Press and should be available through the bookstore or Amazon.com. Another excellent text, *Textbook of Wood Technology* by Panshin and DeZeeuw (McGraw-Hill) is currently out of print. Copies of the 1980 (4th) edition are available online. Google "Textbook of Wood Technology" to see listings.

Supplies: 15X hand lens, available at bookstore; a #2 X-ACTO knife. Get a package or two of #2 **blades**. You will also need a package of Gillette or Shick double-edged razor blades for cutting microscope sections. These can be obtained from drug and variety stores like Wal-Mart, K-Mart, Osco or Albertson's.

Course Objectives: Students will learn to--

- Verbally and diagrammatically describe the different layers of the cell walls of Gymnosperm and Angiosperm xylem.
- Recognize the three anatomical directions and three anatomical planes of wood specimens in hand or under the microscope
- Verbally and diagrammatically describe the microscopic and macroscopic views of a tree's above and below-ground body and appendages
- Identify 35 commercial species of Angiosperm and Gymnosperm xylem using hand lens, razor knife, microscope and identification keys
- Prepare, using sliding microtome and knives they have prepared, 3-section stained microscope slides of a hardwood species and a softwood species. Slides will be graded in accordance with criteria set forth in the Course Pack's section on wood microtechnique.
- Using ASTM standards, prepare specimens for static bending evaluation, perform the standard static bending tests and determine the as-tested strength values as specified in the standards.
- Determine the dry and wet-basis moisture contents of wood and wood products using gravimetric and electrical resistance methods, as outlined in the ASTM standards.
- Determine the specific gravity of wood specimens using methods of ASTM standards.

Course Outcomes: Successful students will--

- Understand the process of wood formation in trees
- Be able to determine the impact of growth-related characteristics and mechanical defects on the anatomical, morphological, mechanical and physical character and properties of wood
- Be able to identify several genera and species of angiosperm and gymnosperm
- Understand the influence of environmental conditions on the durability, service life, strength and flexural properties of wood in service
- Be able to effectively discuss proper species utilization scenarios with wood products industry professionals

TOPIC

Week
Page numbers in parentheses are for Panshin and DeZeeuw if you get one online
1. Introduction; Cell Wall Structure and biochemistry; color, figure, weight. You should order the optional textbooks, if wanted, so you can have them for week three or sooner.
2. Cell Wall Structure (cont.); Introduction to gymnosperm wood structure
3. Gymnosperm wood structure (cont.)
4. Gymnosperm wood features, cell types, structure and identification (pgs. 127-160; 407-501). Gross identification using keys.
5. Examination (Tuesday); Gymnosperm wood features and ID. Microscopic identification using keys.
6. Gymnosperm wood features and ID. Microscopic identification using keys.
7. Gymnosperm wood features and identification (pgs. 127-160; 407-501). Gross and microscopic identification using keys
8. Examination-Gymnosperm structure (Tuesday) Lab quiz- slides & block ID (Thursday)
9. Angiosperm structure and gross identification using keys
10. Angiosperm gross and microscopic identification using keys).
11. SPRING BREAK
12. Examination-Angiosperm structure (Tuesday); Lab quiz- slides & block ID (Thursday).
13. Wood Microtechnique. You will be making your own microscope slides of various wood species. Extra tree harvesting and test-lumber preparation laboratory to be held on Saturday
14. Wood microtechnique. An extra mechanical- testing laboratory will be held this week.
15. Completion of wood microtechnique activities Lecture and lab finals over entire semester during both 2-hour periods this week. Each student will submit one angiosperm and one gymnosperm 3-section slide for evaluation in accordance with the criteria set forth in the course-pack's section covering wood microtechnique

Students are required to have a Course Pack, a 15X-20X hand lens, #2 X-Acto knife and several #2 blades; the textbooks are optional, but not the willingness to work long and hard at learning about the most wondrous creation, short of man, to be found on earth. We will hold class in Forestry 301, the Wood Science Laboratory (JOUR 102), the sawmills @ Lubrecht and even local lumberyards. You will study at home with wood blocks and key and will develop knowledge and skills lacking in all but the finest natural resource managers.

A great deal will be asked of you, but no more than what you are capable of, which is much more than you probably think you have in you. This class will be an enjoyable challenge because of the subject and, hopefully, the attitude with which it shall be taught. I love teaching people about wood. "Real-world" experience is the foundation of the information and techniques you will use and learn, and we will use this experience to make the challenge and rigor of this course purposeful. I look forward to this semester!

Course grading will be as follows:

2 1-hour lecture exams @ 100 pts. each	200
3 Lab quizzes @ 50 pts. each—microscopic and gross identification	150
1 Evaluation of 2 student-prepared microscope slides	200
1 Final Lab Exam @ 200 pts. —microscopic and gross identification	200
1 Final Lecture Exam @ 100 pts.	<u>100</u>
Total Points for the Course	850

Approximate grading scale will be

A = 100-90.0%; **B** = 80.00-89.9%; **C**=70.0-79.9%; **D** = 60.0-69.9%; **F**< 60.0%

Student Conduct Code

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the [Student Conduct Code](#).

http://life.umt.edu/vpsa/student_conduct.php.

Drops, withdraws, change of grade status

Important Dates Restricting Opportunities to Drop a Course Spring 2019:

Deadline	Description	Date
To 15th instructional day	Students can drop classes on CyberBear with refund & no “W” on Transcript, last day to change to Audit	February 3, @5 PM
16th to 45th instructional day	A class drop requires a form with instructor and advisor signature, a \$10 fee from registrar’s office, student will receive a ‘W’ on transcript, no refund.	February 4 – March 24 @5 PM
Beginning 46th instructional day	<u>Students are only allowed to drop a class under very limited and unusual circumstances.</u> Not doing well in the class, deciding you are concerned about how the class grade might affect your GPA, deciding you did not want to take the class after all, switching majors, and similar reasons are not among those limited and unusual circumstances. If you want to drop the class for these sorts of reasons, make sure you do so by the end of the 45 th instructional day of the semester. Requests to drop must be signed by the instructor, advisor, and Associate Dean (in that order) so if you pursue this request, <i>leave sufficient time to schedule meetings with each of these individuals</i> (generally this will take at least 3-5 working days). A \$10 fee applies if approved. Instructors must indicate whether the individual is Passing or Failing the class at the time of request.	March 25 – May 1 @5 PM

Class Attendance Policies

- The University allows faculty some flexibility in establishing absence policies but they need to be specified in the syllabus. For other University guidelines, be sure to read the relevant section of the [UM Catalog](#) (lots of other text on that page, search for “Class Attendance/Absence Policy”).
- See also [Spring 2020 Important Dates and Deadlines](#) calendar (select Spring tab)
 - Students who are registered for a course but do not attend the first two class meetings may be required by the instructor to drop the course. ... Students not allowed to remain must complete a drop form or drop the course through CyberBear to avoid receiving a failing grade. Students who know they will be absent should contact the instructor in advance.
 - Students are expected to attend all class meetings and complete all assignments for courses in which they are enrolled. Instructors are encouraged to notify advisors or the appropriate administrators regarding students with excessive unexcused absences. Instructors ***may excuse*** brief and occasional absences for reasons of illness, injury, family emergency, religious observance, cultural or ceremonial events, or participation in a University sponsored activity. (University sponsored activities include for example, field trips, ASUM service, music or drama performances, and intercollegiate athletics.)

- ***Cultural or ceremonial leave allows excused absences for cultural, religious, and ceremonial purposes to meet the student's customs and traditions or to participate in related activities.*** To receive an authorized absence for a cultural, religious or ceremonial event the student or their advisor (proxy) must submit a formal written request to the instructor. This must include a brief description (with inclusive dates) of the cultural event or ceremony and the importance of the student's attendance or participation. ***Authorization for the absence is subject to approval by the instructor. Appeals may be made to the Chair, Dean or Provost.*** The excused absence or leave may not exceed five academic calendar days (not including weekends or holidays). Students remain responsible for completion or make-up of assignments as defined in the syllabus, at the discretion of the instructor.
- Instructors ***shall excuse*** absences for reasons of military service or mandatory public service.
- See the accompanying "Faculty/Instructor Reference and Referral Guide" document for Title IX requirements regarding attendance questions in relation to a pregnancy.
- Instructors may establish absence policies to conform to the educational goals and requirements of their courses with due consideration of the class's diversity. ***Such policies should be set out in the course syllabus and should include the procedures for giving timely notice of absences, explain how work missed because of an excused absence may be made up, and stipulate any penalty to be assessed for excessive or unexcused absences.***
- The UM Faculty Senate encourages the faculty to accommodate students incurring an excused absence by allowing them to make up missed work when this can be done in a manner consistent with the educational goals of their courses. Students expecting to incur excused absences should consult with their instructors early in the term to be sure that they understand the absence policies for each of their courses."

Students with Disabilities

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

Grading System/Option Statement

- Explanation: At UM, [grading options](#) for courses are traditional letter grade only (T); credit/no credit only (CR/NC), student option/preference (O), or audit (AUD). Student option means students can choose to take a course either as traditional letter grade or as credit/no credit. For these latter courses, some students wish to exercise this option at the end of the semester. Some colleges at UM (e.g., H&S) prefer faculty to offer classes as "student preference." However, most FCFC classes are offered Traditional letter grade only.
 - Faculty can only change the grading option in the first 15 class days of the semester.
- If you offer your class for a letter grade only, you may experience fewer student requests on this issue at the end of the semester if you include the following syllabus statement:
 - Please note, this class is offered for traditional letter grade only, it is not offered under the credit/no credit option.
- If you are uncertain how your class is offered, check with FCFC's Office of Student Services (Shonna or Wendy).