

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

- Instructor:** Ed Burke  
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**Schedule:** Lecture: Tuesday and Thursday, 12:00-1:50 pm, Forestry room 301. 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, lighted hand lens and razor knife handle and blades from Burke-\$60
- 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 DeZeuuw (McGraw-Hill) is currently out of print. Copies of the 1980 (4<sup>th</sup>) edition are available online. Google "Textbook of Wood Technology" to see listings.
- Supplies:** 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.
- Outcomes:** Students will be able 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 a tree's above and below-ground body and appendages
  - Identify 35 commercial species of Angiosperm and Gymnosperm xylem using handlens, razor knife and key
  - Identify 30 commercial species/species groups using prepared microscope slides and key
  - 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 based on the methods outlined in ASTM standards
  - Demonstrate the standard methods of preparation of wood for microscopic examination
  - Demonstrate the cutting of thin sections of wood in the three anatomical planes
  - Demonstrate the staining, clearing, dehydration and mounting of sections prepared with the sliding microtome onto glass slides

| Week | TOPIC  |
|------|--|
|      | <b>Page numbers in parentheses are for Panshin and DeZeuuw if you get one online</b>   |
| 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 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. Burke will be in Tennessee and Virginia teaching shortcourses in structural grading of houselogs and sawn round timbers. |
| 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   | Examination-Angiosperm structure (Tuesday); Lab quiz- slides & block ID (Thursday).  |
| 12   | Wood Microtechnique-students will spend 3 weeks learning to make three-section slides of various wood species using sliding microtomes.  |
| 13   | Microtechnique (cont.)   |
| 14   | Growth-related defects; Wood and wood product pathology; Defect and species ID quiz  |
| 16   | FINALS WEEK- lecture and lab finals over entire semester during 2-hour period.   |

Students are required to have a 15X 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 Final Lab Exam @ 200 pts. —microscopic and gross identification | 200        |
| 1 Final Lecture Exam @ 100 pts.                                   | <u>100</u> |
| <b>Total Points for the Course</b>                                | <b>650</b> |

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://www.umt.edu/policies/browse/student-affairs/student-code-of-conduct). <http://www.umt.edu/policies/browse/student-affairs/student-code-of-conduct>

### Important Dates Restricting Opportunities to Drop a Course in Spring Semester, 2021:

|  |  |   |
|--|--|---|
| To 15 <sup>th</sup> instructional day                  | Students can drop classes on Cyberbear with refund   | 29 January is the last day for unrestricted drops |
| 16 <sup>th</sup> to 45 <sup>th</sup> instructional day | Drop requires form with instructor and advisor signature, a \$10 fee from registrar's office, student will receive a 'W' on transcript, no refund. If you want to drop the class for these less serious sorts of reasons, make sure you do so by the end of the 45 <sup>th</sup> instructional day of the semester ( <b>6 April 2021</b> ).  | 1 February through 10 March                       |
| Beginning 46 <sup>th</sup> instructional day           | Students are only allowed to drop a class under very limited and unusual circumstances. 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, and similar reasons do not qualify as "very 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 <sup>th</sup> instructional day of the semester. Requests to drop must be signed by the instructor, advisor, and Associate Dean (in that order) and a \$10 fee applies. Instructor must indicate whether the individual is Passing or Failing the class at the time of request. | 13 March through 30 April                         |

### Class Attendance Policy

- Students who are registered for a course but do not attend the first two class meetings may be required to drop this course. This rule allows for early identification of class vacancies to permit other students to add classes. Students not allowed to remain must complete a drop form or drop the course on the Internet ([Cyberbear Login](#)).
- Students are expected to attend all class meetings and complete all assignments for this course. Student maybe excused for brief and occasional absences for reasons of illness, injury, family emergency, religious observance or participation in a University sponsored activity. (University sponsored activities include for example, field trips, ASUM service, music or drama performances, and intercollegiate athletics.) Students shall be excused for military service or mandatory public service.
- Students incurring an excused absence will be allowed to make up missed work when done in a manner consistent with the educational goals of this course.

Students expecting to incur excused absences should consult with the instructor early in the term to be sure that they understand the absence policies for this course.