

WOOD 280
WOOD ANATOMY AND IDENTIFICATION
COURSE OUTLINE
2016-2017

Instructor: Dr. Simon Ellis
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Class: Monday, Wednesday, Friday 10:00-11:00 a.m.
Centre for Advanced Wood Processing, Room 2964/5

Laboratory: Thursday 10:00am-12:00p.m.
Forest Sciences Centre, Room 1310

Technician: Diana Hastings
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Teaching Assistant: Timo van der Zwan
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Evaluation: I am prepared to allow you to decide the weighting of the three largest components of your grade. These are the default weightings but you can choose your own weightings within the limits specified. Of course, the total should add up to 100%.

Final exam	40%	(min. 35%, max. 45%)
Mid-term exam	20%	(min. 15%, max. 25%)
Laboratory	25%	(min. 20%, max. 30%)
Assignment	10%	(fixed)
Class participation	5%	(fixed)

(see page 4 for details on the calculation of your lab grade)

You must obtain a passing mark of 50% on both the laboratory and exam components to pass this course.

Attendance: You are expected to attend all classes and laboratories.

Academic Concession:

The University's policy on academic concession is provided in the UBC Calendar (www.students.ubc.ca/calendar/index.cfm?tree=3,48,0,0). This information covers official policy and procedure in the case of a student unable to complete an assignment or examination because of medical, emotional or other problems. If health problems or other legitimate reasons result in you missing an assignment or an exam, please inform me beforehand or as soon after the event as possible.

Course Summary:

This course provides a thorough introduction to the structure of wood. This foundation is fundamental to the study of wood as a material and prepares the student for future courses dealing with the properties, uses and processing of wood. The course introduces basic tree growth and wood formation, detailing both the macroscopic and microscopic anatomy of hardwoods and softwoods. Cell types, their organization and variations are discussed. Emphasis is placed on the structure-function relationship of the cells in the living tree and how this relationship affects the properties of wood as a raw material for the wood products industry. The main chemical components of wood and their organization in the ultra-structure of the woody cell wall are covered. Elements of silviculture are introduced together with discussion of the effects of forestry management practices that influence tree growth and wood formation. Concepts and implications of wood quality are discussed. The laboratories cover the macroscopic and microscopic identification of hardwoods and softwoods.

Class topics:

Introduction to wood
Tree growth and wood formation
Wood cells – hardwoods and softwoods
Figure, grain, knots
Chemical composition of wood
Ultrastructure - molecular organization, cell wall layers
Juvenile wood and reaction wood
Wood quality
Silvicultural effects on wood quality

Textbooks:

The required text for the course is:

Identifying Wood, Accurate results with simple tools. Hoadley, R.B., 1990. Taunton Press. ISBN 0-942391-04-7. 223pp.

This book is an excellent introductory text on wood anatomy and wood identification that includes many useful photographs and diagrams. This book is especially useful for the first half of the term's classes and most of the laboratories.

The following books are on reserve in the I.K. Barber Learning Centre (under WOOD 280), as is a copy of the required text:

Textbook of Wood Technology. Panshin A.J. and C. deZeeuw. 1980. McGraw-Hill. ISBN 0-07-048441-4. 722pp.

This book is the classical North American wood science and technology textbook and includes detailed macroscopic and microscopic descriptions of wood species. In some chapters it goes into much more detail than you are required to cover in this course.

The Anatomy of Wood. Wilson K. and D.J.B. White. 1986. Stobart & Son. ISBN 0-85442-033-9. 309pp.

This book is a good text on wood anatomy. It is useful for some of the material not covered that extensively in Hoadley's text. It has more detailed descriptions of cell types and their organization but not as good diagrams or photographs.

Understanding Wood. Hoadley, R.B., 1980. Taunton Press. ISBN 0-918804-05-1. 256pp.

This book is written more for a lay person than a wood scientist or technologist but it explains some concepts very well. It is a good reference text for general concepts about wood properties.

Science and Technology of Wood. Tsoumis, G.T. 1991. Van Nostrand Reinhold. ISBN 0-442-23985-8. 494pp

Translated from the original Greek text, this book provides a good introduction, at just about the right depth, to a number of the concepts covered in WOOD 280. It provides a good commentary of tree growth and wood formation. The processing sections refer to European examples for the most part.

Learning Objectives:

Upon successful completion of this course you will be able to demonstrate achievement of the following learning objectives which will be assessed using the techniques indicated:

Learning Objective	Assessment Technique
describe the processes by which wood is formed in trees	Mid-term
explain the structures and functions of the most important wood cell types	Mid-term & Lab report
explain how the variations in tissue volume and arrangement influence solid wood properties	Mid-term & Assignment
explain the nature of the fundamental chemical constituents of wood and how their arrangement in the wood cell wall influences wood properties	Mid-term & Final
describe how factors influencing tree growth can lead to different level of variability in wood characteristics and wood properties	Final
discuss how wood quality is affected by wood characteristics and end use requirements	Final & Assignment
predict how silvicultural operations can affect tree growth and wood formation	Final
identify 17 hardwoods and 10 softwoods in the form of individual species, species groups or genera, based on gross physical features and structural features visible with a 10X handlens	Lab quizzes

Course website:

The website for WOOD 280 can be accessed at <http://wood280.forestry.ubc.ca>.

The website is public-access so you do not need any special account to be able to view the material. From this site you can print out most of the course material that supports the lectures and the laboratories. There is a page of instructions on the course website that outlines how you can print out the material in different formats.

Computer generated reports:

For any assignments, if your report is generated using a computer, then all the appropriate files should be backed up on a diskette, CD, USB thumb drive or other storage device. The excuse of a computer file being lost due to a computer crash or virus will not be accepted.

Laboratory schedule:

<i>Week</i>	<i>Topic</i>	<i>Quiz</i>
1	No laboratory	
2	Sale of supplies	
3	Introduction to wood identification	
4	Macroscopic identification of hardwoods	
5	Macroscopic identification of hardwoods	
6	Microscopic features of hardwoods	Hardwood loop 1 (10 samples)
7	Microscopic features of hardwoods	Hardwood loop 2 (10 samples)
8	Macroscopic identification of softwoods	Hardwood board (25 samples)
9	Macroscopic identification of softwoods	No quiz
10	Microscopic features of softwoods	Softwood loop 1 (10 samples)
11	Microscopic features of softwoods	Softwood loop 2 (10 samples)
12	Make-up quizzes	Softwood board (25 samples)
13	Make-up quizzes	Final board (32 samples)

For the calculation of your laboratory average, each quiz and lab report carries an equal weighting (i.e., they will all be graded as a percentage regardless of the number of samples in the quiz) other than the final board quiz which carries a double weighting. Therefore, each lab quiz/report is worth 2-3% of your final grade.

Each of the loop quizzes can be repeated once. The higher mark achieved on each loop quiz shall be used in the calculation of your lab grade.

All of the identification quizzes are open book – you may use any textbooks or notes but no wood samples.

Laboratory supplies

The supplies will be available for purchase in the laboratory sessions.

- Box of approximately 40 wood samples (\$40)
(if you want to, we will buy this box back from you at the end of the course, for an amount reflecting the condition of the box and the samples).
- 10X handlens (\$10, we will also buy this handlens back from you).
- Utility knife with retractable blade (\$8, no buy-back available).

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Criteria for assessment of “Participation” grade

Students are often unsure about the basis used to determine a participation grade. In this course “participation” is considered to be a combination of attendance, contribution and attitude. The following rubric provides an overview of the expectations that a student will be expected to meet in order to receive the grade shown (out of 10).

10	Outstanding	100% punctual attendance and on-time assignment completion. Excellent attitude and effort. Volunteers numerous critical contributions. Facilitates the learning of others.
8	Very good	Near 100% punctual attendance. Assignments completed on-time. Positive attitude and high level of effort. Demonstrates active support for colleagues. High level of critical contribution.
6	Adequate	Only 2-3 sessions of non-punctual/non-attendance. Assignments completed on-time. Satisfactory effort and attitude. Demonstrates passive support for colleagues. Contributes somewhat to class and laboratory processes.
4	Minimal	More than 2-3 sessions of non-punctual/non-attendance. Some assignments not completed on-time. Motivation and initiative low. Minimal level of effort. Little contribution and support offered during class and laboratory processes.
2	Poor	Poor punctual and attendance record. Many assignments not completed on-time. Attitude, participation and effort do not meet acceptable standard. Zero contribution and support during class and laboratory processes.

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2014-2015

I have read and understand the course outline for WOOD 280. The weightings for the different components of the grading scheme that I would like to be applied to my final course grade are as follows.

Laboratory	%
Mid-term exam	%
Final exam	%
Assignment	10 %
Class participation	5 %
TOTAL	100 %

Name

Student Number

Signature