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## Wood Adhesives and Coatings

WOOD 373 (3), 2016 Winter Term 1

**Instructor:** Dr. Scott Renneckar

**Office:** Forest Sciences Centre, Room 4034

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**Class:** Monday, Wednesday 2:00 to 3:00 PM, CAWP (FSC 2964)

**Laboratory:** Thursday 2:00 to 5:00 PM, Forest Sciences Centre 1325

**Laboratory Coordinator:** Diana Hastings, diana.hastings@ubc.ca, FSC room 4642, 604-822-3209

**Teaching Assistant:** MiJung Cho, mijungc@alumni.ubc.ca, FSC room 4332

**Description:** This course describes the molecular aspects of wood and compounds related to adhesion and durability (coatings and preservatives). The course provides an overview of adhesion from the molecular level of why and how things stick together. Wood biopolymers are used as examples to illustrate and introduce polymer science topics, with a focus on the chemistry, behaviour, and performance of thermoplastic and thermosetting materials used for adhesives and coatings.

**Learning Objectives:** Upon successful completion of this course you will be able to:

1. Describe wood structure from the molecular level perspective
2. Explain, using examples, how the molecular form of polymers affects their physical properties,
3. Describe how adhesive systems cure and bond with wood surfaces,
4. Describe the chemistry of important wood adhesives and provide examples of their commercial applications,
5. Describe, using examples, the functional requirements of wood finishes and coatings,
6. Explain the chemistry and resulting characteristics of wood finishes and coatings,
7. Explain the composition of commercial wood preservatives and their suitability for different end-uses.
8. Compare and contrast new technologies (nanomaterials) in adhesives and coatings

### Class topics:

Relevant topics in organic chemistry applied to wood chemistry and adhesion (3 weeks)

Introduction to polymer chemistry applied to wood materials (3 weeks)

Theories of adhesion and related physical chemistry topics (wetting) (1 week)

The peculiarities of wood surfaces (1 week)

Wood adhesives and properties (1 week)

Wood coating classification and chemistry and wood coating formulation (2 weeks)

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Preservative treatment classification and chemistry (1 week)  
New technologies in adhesives and coatings (1 week)

**Course Website:**

The website for this course, <http://wood373.forestry.ubc.ca/>, contains class materials such as the course outline, class notes, reading lists, project information, and laboratory handouts. The course website will be updated throughout the semester.

**Reading and Supplemental Learning Material:**

Reading material is accessible through UBC library services and links will be emailed to the class list. Concepts and examples found in the reading material will be used to support lecture materials and they will be on quizzes and exams.

<b>Evaluation:</b>	Final exam	35%	TBD
	Mid-term exam	20%	October 26th
	Laboratory	20%	See laboratory handout
	Quizzes (best 3 of 4)	15%	Sept. 26 <sup>th</sup> , Oct. 19 <sup>th</sup> , Nov. 14 <sup>th</sup> & 28 <sup>th</sup>
	Project	10%	TBD

Percentage (%)	Letter Grade	Percentage (%)	Letter Grade
90-100	A+	64-67	C+
85-89	A	60-63	C
80-84	A-	55-59	C-
76-79	B+	50-54	D
72-75	B	0-49	F (Fail)
68-71	B-		

**Note-** Quizzes cannot be made-up; contact me about extremely special circumstances surrounding missing an exam; late lab reports will not be graded.

**Laboratory:**

Laboratories will be broken into multiple sessions on Thursday afternoons. Each student will be assigned a group and the time to meet for that session. Some laboratory activities will take place independently as required throughout the week.

**Project:**

There is a term project require for this course. Each group will be divided up in teams of up to two to three students and work together throughout the term outside of lecture time. A single report will be turned in by each team. A separate handout will provide the details for the project.

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**Plagiarism:**

There is a zero tolerance policy for turning in assignments that are not your own work (in this course or other courses at UBC). If you are unsure about what plagiarism see the following website:

<http://learningcommons.ubc.ca/resource-guides/avoiding-plagiarism/>

**Computers:**

Every student needs access to a computer to complete computer generated assignments and laboratory reports. With the ability to email files, save to flash drive, dropbox, etc., no exceptions will be made for lost files, broken computers, viruses, or other computer related issues.

**Attendance:**

UBC attendance policy is that regular attendance is expected.

**Academic Concessions Policy:**

Please read the following policy at the UBC website on academic concessions.

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,48,0,0> Contact me immediately to arrange concessions for conflicting responsibilities and unforeseen events.