Syllabus IENG 613-3 (NRES 798)

Wood Design I

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Course dates: May 27 – June 13 2019

Course description:

This course focuses on the structural design of timber members and connections.

Office hours:

I maintain an "open door" policy; if my door is open. You can also book appointments.

Course objectives

The objectives of the course are:

i) to help you understand the behavior of timber as a structural material,

ii) to develop your ability to design timber structural elements and connections; and

iii) to help you gain team-working and problem-solving skills.

More specifically, by the end of this course, you will be able to:

- Relate wood properties to its application as a structural material;
- Design members according to CSA-086-14;
- Design connections according to CSA-086-14.

Course materials:

All assignments, laboratory handouts and other course material will be send by e-mail.

Safety procedures:

Lab safety procedures have to be followed and lab safety gear has to be worn in the lab.

Academic Student Conduct:

Guidelines for Academic Student Conduct are detailed in the Graduate Academic Calendar which can be found in the printed and on-line versions. The course is governed by these regulations and policies. Please ensure that you are aware and understand the procedures.

Team-Based-Learning

The course will be partially delivered in the Team-Based-Learning (TBL) format. Numerous studies show that students retain much more of the content presented and develop higher skills in a TBL course than a conventional lecture-based course. TBL makes better use of the student and instructor time by switching where the learning activities take place:

- Initial exposure to material is gained out of class through reading assignments;
- Key points are reinforced by the instructor using mini-lectures, and then exercises and active learning take place in the classroom and the tutorial room;
- Realistic, challenging problems are completed by students in and out of class, and conclude with debriefings and discussions by the instructor in class.

These activities ensure that you see the course material multiple times and in different ways.

Team structure

You are assigned to a team with three members:

Team 1:

Team 2:

Team 3:

Required textbook

"Wood Design Manual 2017"

Additional resources

- National Building Code of Canada 2015: http://www.nrc-cnrc.gc.ca
- WoodWorks® software: http://www.cwc.ca/
- WoodWorks® software guide: http://www.cwc.ca/software
- Wood Handbook: http://www.fpl.fs.fed.us/products/publications/
- Timber, its nature and behaviour, Dinwoodie: http://resources.library.ubc.ca/682
- Structural Wood Design, Aghayere and Vigil
- Timber Construction Manual, American Institute of Timber Construction
- Wood Construction Manual, Herzog, Natterer, Volz
- Wood Engineering and Construction Handbook, Faherty and Williamson

Course schedule

Class	Day	Date	Class activity	Deliverables
1	Mon	May 27	Wood mechanics and design	
2	Tue	May 28	Bending members	
3	Wed	May 29	Tension/compression members	
4	Thu	May 30	Members under combined loading	Assignment 1
5	Fr	May 31	Cross-laminated timber	
6	Mo	June 03	Bolted connections	Design Task 1
7	Tue	June 04	Screw connections	
8	Wed	June 05	Rivet Connections	
9	Thu	June 06	Moment connections	Assignment 2
10	Fri	June 07	Lab testing	
11	Mo	June 10	Lab presentations, other connections	Design Task 2
12	Tue	June 11	S-Timber workshop	
13	Wed	June 12	Additional topics and course review	Lab report
14	Thu	June 13	Exam	

Note: schedule subject to adjustments during course

Grading structure and rules

Item	weight
Individual assignments	20%
Team Design Tasks*	20%
Lab project*	10%
Final exam	50%

***Individual grades subject to peer assessment.

- Late submissions of deliverables will NOT be accepted.
- The final exam is open book.
- The presentation of computations in a concise and readable manner, providing relevant assumption and equations to show how you arrived at the – clearly identified – answer is part of the marking criteria for design tasks and final exam.
- In order to pass the course, UNBC graduate programs require that both final exam as well as the overall grade must be at least 70%.
- To pass the course as audit, full participation in all class and team activities is required.