

Course: Seismic Design & Analysis of Wood Structures

Lecturer: Bryan Folz, PhD, PEng

Date: 06/03/2017 – 31/03/2017

Classroom: Sala del Camino @ IUSS

Classroom 1 @ Eucentre (Final Exam)

Course schedule

Week	Date	Lecture hours	Tutorial hours	Subject	Tot hr
1	07/3/17	10 am - 1 pm	2:30 - 4:30 pm	Course overview; Types of wood structures; Properties of wood. Assignment No. 1 – Size effect in wood.	5
	08/3/17	10 am - 1 pm	2:30 - 4:30 pm	Codified design of wood structures; Design of bending members; Design of compression members. Assignment No. 2 – CUREE hysteretic model.	5
	09/3/17	10 am - 1 pm	2:30 - 4:30 pm	Design for combined loading; Design of connections. Project introduction.	5
2	14/3/17	10 am - 1 pm	2:30 - 4:30 pm	Analysis of connections. Assignment No. 3 – Glulam beam design aid.	5
	15/3/17	10 am - 1 pm	2:30 - 4:30 pm	Design of shear walls and diaphragms.	5
	16/3/17	10 am - 1 pm	2:30 - 4:30 pm	Analysis of shear walls. Assignment No. 4 – Shear wall analysis using CASHEW.	5
3	21/3/17	10 am - 1 pm	2:30 - 4:30 pm	Analysis of wood frame structures. Assignment No. 5 – Building analysis using SAWS.	5
	22/3/17	10 am - 1 pm	2:30 - 4:30 pm	Direct displacement design.	5
	23/3/17	10 am - 1 pm	2:30 - 4:30 pm	Cross-laminated timber (CLT/XLAM) properties and design.	5
4	28/3/17	10 am - 1 pm	2:30 - 4:30 pm	CLT connection details. Project presentations.	5
	29/3/17	10 am - 1 pm	2:30 - 4:30 pm	CLT system analysis and performance. Project presentations.	5
	30/3/17	10 am - 1 pm	2:30 - 4:30 pm	Course summary and review.	5
	31/3/17	10 am – 1 pm	-----	Final Exam (@ EUCENTRE)	3

Brief Contents Description and Course Syllabus:

This course provides an introduction to the material properties; construction practices; codified design of wood structural elements, assemblies and connections; and the seismic design and analysis of lateral force resisting elements of wood buildings and overall building response.

Properties of wood: material structure, mechanical properties, inherent variability, material testing and data fitting, and environmental influences. Types of wood structures and construction practices: wood frame construction and mass timber building (post and beam, glued-laminated timber and cross-laminated timber CLT/XLAM) with case studies. Codified design of wood members and systems: bending, compression, combined loading, connections, and lateral force resisting systems consisting of wood shear walls and diaphragms. Numerical models are presented for the hysteretic behaviour of connections, the cyclic response of shear walls and the seismic response of wood structures. An overview of past research activities on the seismic performance of wood structures and future trends in research are highlighted.

Textbook and Resources:

- No assigned textbook.
- All pertinent reference material for the course will be provided digitally.
- Analysis programs and user manuals will be provided.

Evaluation:

Assignments (5)	50 %
Project – oral presentation	20 %
Final exam	30 %
Total	<u>100%</u>

Project: Oral presentation summarizing a current published work on cross laminated timber. Selected list of appropriate publications will be provided. Intent of this project is to provide students with an appreciation of the current state of research activities and pique their interest in considering research in the area of wood structures.