

Structural Design in Timber

Textbooks: *Wood Design Manual (2010)* – **required**
Introduction to Wood Design, 2011 Edition – **recommended**

These books are available directly from the Canadian Wood Council:

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Or from the website at:

www.cwc.ca

Lecture Outline

<u>Week</u>	<u>Lectures</u>
1	<ul style="list-style-type: none">• Introduction<ul style="list-style-type: none">○ Wood as a green building material○ History of wood structures• Physical and mechanical properties of wood<ul style="list-style-type: none">○ Molecular and cell structure○ Physical properties○ Mechanical properties• Structural wood products & structural forms• Strength and modification factors<ul style="list-style-type: none">○ Specified strength of wood, size, use, species and grade – characteristic values○ Modification Factors
2	<ul style="list-style-type: none">• Shrinkage calculation• Modification factors
3	<ul style="list-style-type: none">• Design Process<ul style="list-style-type: none">○ Limit States Design – Ultimate & Serviceability Limit States

	<ul style="list-style-type: none"> • Design of Tension Members • Design of Compression Members (Intro)
4	<ul style="list-style-type: none"> • Design of Compression Members <ul style="list-style-type: none"> ○ Stud walls ○ Columns ○ Built-up columns
5	Wood Works design office software
6	<ul style="list-style-type: none"> • Design of Bending Members <ul style="list-style-type: none"> ○ Solid lumber beams, joists, planks ○ Glulam – straight prismatic beams, tapered straight beams
7	<ul style="list-style-type: none"> • Fire safety • Design of Bending Members (continue) <ul style="list-style-type: none"> ○ Solid lumber beams, joists, planks ○ Glulam – straight prismatic beams, tapered straight beams
9	<ul style="list-style-type: none"> • Combined bending and axial load
10	<ul style="list-style-type: none"> • Connectors <ul style="list-style-type: none"> ○ Nails and spikes ○ Bolts and lag screws
12	<ul style="list-style-type: none"> • Connectors (continue) <ul style="list-style-type: none"> ○ Nails and spikes ○ Bolts and lag screws
13	<ul style="list-style-type: none"> • Lateral loading and design <ul style="list-style-type: none"> ○ Shear wall / diaphragms ○ WW software (shearwalls)

References:

CSA standard O86-09 Engineering design in wood

Engineering Guide for Wood Frame Construction. Canadian Wood Council, Ottawa, 2009

Fire Safety Design in Buildings. Canadian Wood Council, Ottawa, 1996.

Wood Handbook - Wood as an Engineering Material, USDA, Forest Products Laboratory, Madison WI. pdf can be downloaded from: <http://www.fpl.fs.fed.us/products/publications/>

Forest Products and Wood Science, An Introduction. John Haygreen, Jim Bowyer, Iowa State University Press, Ames, Iowa, 3rd edition, 1996.

Introduction to Wood Building Technology. Canadian Wood Council, Ottawa, 1997.

Introduction to Wood Design. Canadian Wood Council, Ottawa, 2011

National Building Code of Canada 2010. <http://www.nrc-cnrc.gc.ca>

Structural Behavior of Timber, Borg Madsen, 1992

The State of Canada's Forests, 2001-2002. Natural Resources Canada, Canadian Forest Service, Ottawa, 2002

Wood Design Manual. Canadian Wood Council, Ottawa, 2010

Wood Reference Handbook. Canadian Wood Council, Ottawa, Fourth Edition, 2000

WoodWorks® software: <http://cwc.ca/woodworks-software/>

WoodWorks® software guide: <http://cwc.ca/wp-content/uploads/downloads-can-DesignOfficeUserGuide2010.pdf>