STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

CIVL 306 – TIMBER DESIGN

CIP Code: 14.0803

Created by: Saeid Haji Ghasemali
Updated by:

School: Canino School of Engineering Technology
Department: Civil and Construction Technology
Implementation Semester/Year: Fall 2026

A. TITLE: Timber Design

B. COURSE NUMBER: CIVL 306

C. CREDIT HOURS (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity):

# Credit Hours per Week	**3**
# Lecture Hours per Week	**2**
# Lab Hours per Week	**2**
Other per Week	

D. WRITING INTENSIVE COURSE:

Yes	
No	x

E. GER CATEGORY:

Does course satisfy a GER category(ies)? If so, please select all that apply.

[1-2] Communication	
[3] Diversity: Equity, Inclusion & Social Justice	
[4] Mathematics & Quantitative Reasoning	
[5] Natural Science & Scientific Reasoning	
[6] Humanities	
[7] Social Sciences	
[8] Arts	
[9] US History & Civic Engagement	
[10] World History & Global Awareness	
[11] World Languages	

F. SEMESTER(S) OFFERED:

Fall	
Spring	x
Fall and Spring	

G. COURSE DESCRIPTION:

The dimensional features, structural properties and behavior under load of wooden structural members are presented. Students learn standard methods for the analysis and design of timber-framed structural elements including beams, joists, rafters, posts (columns), braces, gussets and fasteners. Load and Resistance Factor Design and Allowable Strength Design are employed. Use and selection of engineered lumber products such as glu-lams and laminated veneer lumber is included.

H. PRE-REQUISITES:

CIVL 303 Structural Analysis, or permission of the instructor.

CO-REQUISITES:

I. STUDENT LEARNING OUTCOMES:

Course Student Learning Outcome [SLO]	Program Student Learning Outcome [PSLO]	GER	ISLO & Subsets
a) Determine loads to be used in the design of residential and non-residential light and heavy wood framed structures from references, NYS Building Code, ICBO.	SO 2, SO7		ISLO 5
b) Select repetitive flexural members (joists, rafters) for use in wood frame structures from tables.	SO 2, SO7		ISLO 2 (PS) and ISLO 5
c) Determine the required size of timber beams.	SO 2, SO1		ISLO 5
d) Determine the size and spacing of rectangular "columns".	SO 2, SO1		ISLO 5
e) Specify the number of fasteners required in a connection.	SO 2, SO1		ISLO 2 (PS) and ISLO 5

KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA], Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit, /Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL],* *Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

J. APPLIED LEARNING COMPONENT:

Yes	
No	x

If yes, select [X] one or more of the following categories:

Classroom / Lab		Community Service	
Internship		Civic Engagement	
Clinical Practicum		Creative Works/Senior Project	
Practicum		Research	
Service Learning		Entrepreneurship [program, class, project]	

K. TEXTS:

Breyer, Cobeen, Fridley, and Pollock, Design of Wood Structures, 7th ed., McGraw Hill, 2015, ISBN 978-0-07-174560-4.

L. REFERENCES:

International Building Code, New York State Building Code, ASCE 7

M. EQUIPMENT: None

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Exams
Quizzes
Design Project(s)
Homework
Laboratory projects

P. DETAILED COURSE OUTLINE:

I. Material properties
- A. Lumber Strength
- B. Lumber Defects
- C. Design Factors
- D. Load Calculations

II. Flexural Member (Beam) Design
- A. Joist Design
- i. Use of Joist Tables
- B. Bearing Stress Consideration
- C. Timber Beams
- D. Effects of Lateral Support
- E. Shear Stress Considerations
- i. Notches
- F. Flitched Beams
- G. Plywood Composite Beams
- H. Glu-Lam Beams

III. Design of Axial loaded Members
- A. Buckling Formulas
- B. Long, Intermediate, and Short Columns
- C. Round Columns
- D. Braced Columns
- E. Built-up Columns
- F. Column Spacing
- G. Beam-Columns
- H. Eccentric Loading Effects
- I. Braces in Tension

IV. Connections
- A. Fastener spacing
- B. Wind Uplift Analysis
- C. Metal connectors
- D. Connection Design
- E. Nails and nailing
- F. Screws

V. Wood Trusses
- A. Top Chord Analysis
- B. Bottom Chord Analysis
- C. Web Members
- D. Truss Plates
- E. Truss Bracing Requirements

VI. Glue-Lam Arches
- A. Graphical Analysis

VII. Diaphragms
- A. Plywood and panel products
- B. Shear Wall Design and Analysis
- C. Stressed Skin Panels
- D. Structural Insulated Panels

Q. LABORATORY OUTLINE:

1. Beam Design
2. Column Design
3. Connection Design
4. Wood Truss Design