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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
CONS 370 – TIMBER DESIGN

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Canino School of Engineering Technology

Department: Civil and Construction Technology

Semester/Year: Fall 2018

A. **TITLE**: Timber Design

B. **COURSE NUMBER:** CONS 370

C. **CREDIT HOURS: 3 credit hour(s) per week for 15 weeks**

D. **WRITING INTENSIVE COURSE**: Yes ☐   No ☒

E. **GER CATEGORY: None:** ☒   **Yes:** GER
If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED: Fall** ☒   **Spring** ☐   **Fall & 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: None** ☐   **Yes** ☒   **If yes, list below:**

CONS 336 (Structural Analysis) and CIVL 339 (Structural Analysis Lab)

CO-REQUISITES: None ☒   **Yes** ☐   **If yes, list below:**

CIVL 339 (Structural Analysis Lab) could be taken concurrently with this class.

I. STUDENT LEARNING OUTCOMES: (*see key below*)

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	Program Student Learning Outcome [PSLO]	GER [If Applicable]	ISLO & SUBSETS	
a) Determine loads to be used in the design of residential and non-residential light and heavy wood framed structures from references such as ASCE 7, NYS Building Code, ICBO.			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
b) Select repetitive flexural members (joists, rafters) for use in wood frame structures from tables.			2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	Subsets Subsets Subsets Subsets
c) Determine the required size of timber beams.			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
d) Determine the size and spacing of rectangular "columns".			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
e) Specify the number of fasteners required in a connection.			2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	Subsets Subsets Subsets Subsets

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**

*Include program objectives if applicable. Please consult with Program Coordinator

J.   <u>**APPLIED LEARNING COMPONENT:**</u>   Yes ☐   No ☒

If YES, select one or more of the following categories:

☐ Classroom/Lab
☐ Internship
☐ Clinical Placement
☐ Practicum
☐ Service Learning
☐ Community Service

☐ Civic Engagement
☐ Creative Works/Senior Project
☐ Research
☐ Entrepreneurship
  (program, class, project)

K. <u>**TEXTS**</u>**:**

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

L. <u>**REFERENCES**</u>**:**

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

M. <u>**EQUIPMENT**</u>**: None** ☒ **Needed:**

N. <u>**GRADING METHOD**</u>**:** A-F

O. <u>**SUGGESTED MEASUREMENT CRITERIA/METHODS**</u>**:**

• **Exams**
• **Homework Assignments**
• **Projects**

P. <u>**DETAILED COURSE OUTLINE**</u>**:**

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.   <u>LABORATORY OUTLINE</u>**: None** ☐   **Yes** ☐

NA – The 2 hour session will not be operated as a traditional lab. Rather the additional time will allow the instructor to engage the student in lengthy problem solutions associated with current lecture topics.