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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
CIVL 339 – Structural Analysis Lab

Created by: Yilei Shi

Updated by:

Canino School of Engineering Technology

Department: Civil and Construction Technology

Semester/Year: Fall 2019

A. **TITLE**: Structural Analysis Lab

B. **COURSE NUMBER:** CIVL 339

C. **CREDIT HOURS: 1 credit hour(s) per week for 15 weeks**

☐ One hour (50 minutes) of lecture per week
☒ Two to three hours of lab or clinical per week 2 hours
☐ Two hours of recitation per week
☐ 40 hours of internship

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:**

Students in this class will apply structural analysis software to perform a 3D frame structure analysis.

H. **PRE-REQUISITES: None** ☐ **Yes** ☒ **If yes, list below:**

CONS 336 Structural Analysis, or permission from the instructor

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

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. Calculate the dead and live loads to be considered for structural analysis.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
b. Calculate the wind and/or earthquake loads to be considered for structural analysis.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
c. Calculate other applicable loads to be considered for structural analysis.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
d. Construct structural model in structural analysis software.	2488: SO 1, 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
e. Design load cases and load combinations per ASCE 7-10.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
f. Perform structural analysis and interpret the results for member design.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets

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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. APPLIED LEARNING COMPONENT: 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. TEXTS:

No text required.

L. REFERENCES:

R. C. Hibbeler, Structural Analysis, 9th Edition, Pearson, 2015, ISBN 978-0-13-394284-2.
ASCE 7-10, Minimum Design Loads for Buildings and Other Structures,ASCE,2013, ISBN 978-0-7844-1291-6.

M. EQUIPMENT: None ☐ **Needed:** scientific calculator, scale/straight edge, engineering paper

N. GRADING METHOD: A - F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Assignments, Term Project

P. DETAILED COURSE OUTLINE:

NONE

Q. LABORATORY OUTLINE: None ☐ **Yes** ☒

1. Introduction
- **a. Introduction of structural engineering design and analysis**
- **b. Introduction of codes, manuals and specifications for structural engineering design**
- **c. Introduction of general structural analysis software application**

2. Structural Idealization and Geometric Model Setup
- **a. Structural models of tall rise buildings**
- **b. Structural models of highway bridges and long-span bridges**
- **c. Structural tests**
- **d. Geometric model setup**

3. Material, Boundary Condition and Definitions
- **a. Material definitions**
- **b. Boundary condition definitions**

4. Structural Load Modeling
- **a. Dead loads**
- **b. Floor and roof live loads**
- **c. Wind load**
- **d. Earthquake load (Optional)**
- **e. Snow load**

5. Load Cases and Load Combinations
- **a. ASCE LRFD load combinations**
- **b. ASCE ASD load combinations**
- **c. AASHTO LRFD load combinations**
- **d. AASHTO ASD load combinations**

6. Model Validation and Structural Analysis Execution
- **a. Approximate method**
- **b. Model validation**
- **c. Analytical module**
- **d. Static and dynamic analysis**
- **e. Lateral load distributions on shear walls**

7. Structural Analysis Report
- **a. Structural analysis results and discussions**
- **b. Structural analysis report**