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:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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<tr>
<td>a. Calculate the dead and live loads to be considered for structural analysis.</td>
<td>2488: SO 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td>b. Calculate the wind and/or earthquake loads to be considered for structural analysis.</td>
<td>2488: SO 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
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<td>c. Calculate other applicable loads to be considered for structural analysis.</td>
<td>2488: SO 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
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<td>d. Construct structural model in structural analysis software.</td>
<td>2488: SO 1, 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td>e. Design load cases and load combinations per ASCE 7-10.</td>
<td>2488: SO 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
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<td>f. Perform structural analysis and interpret the results for member design.</td>
<td>2488: SO 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
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<td>KEY</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
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<td>ISLO &amp; Subsets</td>
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| 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:**


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