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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
CONS 336 – STRUCTURAL ANALYSIS

Created by: Yilei Shi

Updated by:

Canino School of Engineering Technology

Department: Civil and Construction Technology

Semester/Year: Fall 2018

A. **TITLE**: Structural Analysis

B. **COURSE NUMBER:** CONS 336

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

 # Credit Hours: 3
 # Lecture Hours: 2 **per week**
 # Lab Hours: **per week**
  Other: (1) two-hour recitation **per week**

Course Length: 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 course analyzes statically determinate and indeterminate structures. Additional topics of influence lines, moving loads, member forces and stresses, deflections, flexibility and stiffness analyses are explored using computer applications.

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

C or better in CONS 272 (Strength of Materials for Technicians) or ENGS 203 (Engineering Strength of Materials); and MATH 162 (Calculus II)

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. Determine the dead and live loads to be considered for structural analysis.			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
b. Determine whether a structure is statically determinate or indeterminate.			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
c. Determine shear and moment functions and diagrams for beams and frames.			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
d. Determine the effect of moving loads on structures using influence lines.			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
e. Determine the forces and deflections of structural members and frameworks using various analytical techniques.			5-Ind, Prof, Disc, Know Skills ISLO 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. **APPLIED LEARNING COMPONENT:**   Yes ☐   No ☒

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

☐ Classroom/Lab   ☐ Civic Engagement
☐ Internship   ☐ Creative Works/Senior Project
☐ Clinical Placement   ☐ Research
☐ Practicum   ☐ Entrepreneurship
☐ Service Learning   (program, class, project)
☐ Community Service

K. **TEXTS:**

R. C. Hibbeler, Structural Analysis, 9th Edition, Pearson – Prentice Hall, 2015.

L. **REFERENCES:**

M. **EQUIPMENT: None** ☐ **Needed:** Computer Laboratory

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

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

P. **DETAILED COURSE OUTLINE:**

a. Types of Structures and Loads
b. Statically Determinate Structures
  i. Determinacy and Stability
  ii. Truss Analysis
  iii. Shear and Moment Functions
  iv. Shear and Moment Diagrams for a Beam
  v. Shear and Moment Diagrams for a Frame
  vi. Influence Lines
  vii. Moving Loads
c. Deflections
  i. Beam Theory
  ii. Geometric Methods
  iii. Energy Methods (optional)
d. Statically Indeterminate Structures
  i. Approximate Analysis (optional)
  ii. Force Method
  iii. Displacement Method
  iv. Influence Lines (optional)

e. Stiffness Method (optional)

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