

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



COURSE OUTLINE

CONS 233 - STRUCTURAL DRAFTING

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**CANINO SCHOOL OF ENGINEERING TECHNOLOGY
DEPARTMENT OF CIVIL and CONSTRUCTION TECHNOLOGIES
May 2015**

CONS233 - STRUCTURAL DRAFTING

- A. **TITLE:** STRUCTURAL DRAFTING
- B. **COURSE NUMBER:** CONS233
- C. **CREDIT HOURS:** 3
- D. **WRITING INTENSIVE COURSE:** NO
- E. **COURSE LENGTH:** 15 weeks
- F. **SEMESTER(S) OFFERED:** Spring
- G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**

1 hour lecture, 4 hours lab per week

H. **CATALOG DESCRIPTION:**

An introduction to the preparation of drawings typically used in the structural design industry. The greatest emphasis is on the creation of structural steel details. Detailing of timber and reinforced concrete structures will also be presented and performed. The lab work engages the student with “AutoCad Revit” for structures. Building Information Modeling (BIM) is introduced. Some structural design is required.

I. **PRE-REQUISITES/CO-COURSES:**

Prerequisites: SOET116 Introduction to Computer Aided Drafting and Design or equivalent introductory course in the use of cadd, and CONS272 Strength of Materials for Engineering Technicians.

J. **GOALS (STUDENT LEARNING OUTCOMES):**

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

<i>Course Objective</i>	<i>Institutional SLO</i>
a) Prepare structural detail drawings consistent in form and content with standard practice in the industry.	3. Professional Competence 1. Communication
b) Apply principles of statics and strength of materials in the design and detailing of structural members and connections.	3. Professional Competence
c) Employ professional reference manuals such as the AISC Manual for Steel Construction to assist with outcome 1.	3. Professional Competence
d) Operate a computer drawing application such as AutoCad with proficiency in the preparation and printing of structural detail drawings.	3. Professional Competence

K. **TEXTS:** Suggested texts include:

Structural Drafting , David L. Goetsch, Delmar, ISBN 13: 9780827363021

Structural Steel Drafting and Design, David MacLaughlin: Hector Estrada, Delmar Publishing, ISBN 13:9781401890322, 10:1401890326

L. **REFERENCES:** AISC American Institute of Steel Construction Manual of Steel Design

M. **EQUIPMENT:** Computer classroom/lab

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

N. **MEASUREMENT CRITERIA/METHODS:**

- Exams
- Quizzes
- Drawing assignments

O. **DETAILED COURSE OUTLINE:**

I. Introduction

- A. Definition
- B. Types of Structural Drawings
- C. Employers
- D. Structural Drafting Techniques
- E. Linework
 - i. Linetypes
 - ii. Lettering
 - iii. Use of scales
 - iv. Paper sizes
 - v. Title blocks and borders

II. Structural Steel Drafting

- A. Structural Steel Framing Plans
 - i. Structural Steel Drawings
 - ii. Structural steel framing products (W, C, etc)
 - iii. Long Span products (open web joists)
 - iv. Framing Plans
 - v. Drawing Framing Plans
- B. Structural Steel Sections
 - i. Defined
 - ii. Full, Partial and Offset Sections
 - iii. Section conventions
 - iv. Drawing Structural Steel Sections
- C. Structural Steel Connection Details
 - i. Drawing Structural Steel Connection Details
- D. Structural Steel Fabrication Details
 - i. Shop Drawings defined
 - ii. Detail/Fabrication drawings defined
 - iii. Construction Fabrication Details
- E. Structural Steel Bill of Materials
 - i. Common conventions for adding bill of materials
- F. Welds and welded connections
 - i. Types of welds
 - ii. Computing Strength of welds
 - iii. Using weld symbols in fabrication drawings

III. Structural Poured in Place Concrete Frames

- A. Poured in Place (PIP) Concrete Foundations
 - i. PIP Concrete Construction
 - ii. PIP concrete drawings
 - iii. Sheet Layout and Scales
 - iv. Mark Numbering Systems
 - v. Schedules
 - vi. PIP foundation drawings

- B. PIP Concrete Walls and Columns
 - i. PIP Concrete Walls and Columns Explained
 - ii. Wall and column Engineering Drawings
 - iii. Wall and Column Placing Drawings
 - C. PIP Concrete Floor Systems
 - i. PIP Concrete Floor Systems Explained
 - ii. One way solid slab and beam
 - iii. One way ribbed or joist slab
 - iv. Two Way Solid Slab and Beam
 - v. Two Way Flat Plate Floor Systems
 - vi. Waffle Slab PIP
 - vii. Concrete Floor System Drawings
- IV. Structural Wood Drafting
- A. Structural Wood Floor Systems
 - B. Structural Wood Walls
 - C. Structural Wood Roofs
 - D. Timber Construction
 - i. Post and Beam Construction
 - ii. Laminated Arches
 - iii. Laminated Beams and Girders
 - iv. Post, Beam and Arch Drawings
 - v. Fasteners, connecting devices and methods

Q. LABORATORY OUTLINE:

- I. Introduction to Structural Drawing Techniques
 - A. Review of manual drafting methods, lettering, line types and scaling
 - B. Introduction to AutoCad Revit -
 - C. First drawing with Revit
- II. Structural Steel
 - A. Drawing Structural Steel Framing Plans
 - B. Drawing Structural Steel Sections
 - C. Drawing Structural Steel Connections
 - D. Creating Steel Fabrication Details
 - E. Steel Project
- III. Exam 1
- IV. Concrete
 - A. Drawing Structural Concrete Foundation Elements
 - B. Drawing PIP Concrete walls and columns
 - C. Drawing Concrete floors and beams
 - D. PIP Concrete project
- V. Exam 2
- VI. Wood Framing
 - A. Drawing Wood Floor system
 - B. Drawing Wood Wall system
 - C. Drawing Wood Roof system
 - D. Drawing Post and Beam Structural Elements
 - E. Timber Project
- VII. Final Exam Drawing