CONS111 – COMMERCIAL STRUCTURES

A. **TITLE:** Commercial Structures

B. **COURSE NUMBER:** CONS 111  
   **SHORT TITLE:**

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE (OPTIONAL):** N/A

E. **COURSE LENGTH:** 15 weeks

F. **SEMESTER(S) OFFERED:** Spring

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**  
   2 - 50 minute lectures; 1 - 3-hour laboratory

H. **CATALOGUE DESCRIPTION:** The study of construction materials, practices, equipment and terminology used in commercial construction. Lectures and laboratory periods develop theory and practice in excavation; foundation formwork; masonry walls; concrete; erection of steel frame buildings; commercial wall and roof systems; and interior and exterior wall finishes. Field trips to be arranged when practical.

I. **PRE-REQUISITES/CO-COURSES:** None

J. **GOALS (STUDENT LEARNING OUTCOMES):**  
   By the end of this course, the student will be able to:

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<tr>
<th>Course Objective</th>
<th>Canton Student Learning Objective</th>
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<tr>
<td>a. Explain the major elements involved in the process of constructing a building including options and concerns associated with foundations, structural frames and walls, exterior finish (cladding), interior walls and finish, and roofs.</td>
<td>3: Professional Competence</td>
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<td>b. Discuss the properties and assembly techniques of the materials (steel, masonry, concrete) commonly used in construction of non-residential buildings.</td>
<td>3: Professional Competence</td>
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<td>c. Perform calculations associated with construction planning and material estimating. This includes the use of English and SI systems, length conversions, area and volume calculations.</td>
<td>3: Professional Competence</td>
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| d. Communicate using an extensive vocabulary of construction terms and phrases common to the industry. | 1: Communication  
                                         3: Professional Competence |
K. **TEXTS:** Principles and Practices of Commercial Construction 6th Ed, Andres and Smith, Prentice Hall

L. **REFERENCES:** Engineering News Record, Civil Engineering, Concrete Construction, Modern Steel Construction

M. **EQUIPMENT:** No special equipment required

N. **GRADING METHOD:** A – F

O. **MEASUREMENT CRITERIA/METHODS:**

- Exams
- Quizzes
- Home Assignments
- Lab: Participation and assignments
- Field Trips required

P. **DETAILED TOPICAL OUTLINE:**

I. Introduction to the Building Process
   1. Feasibility of designs
   2. Choosing a building system
   3. The work of the design professional
   4. Involvement of the building codes
   5. The role of specifications and their divisions in the building process

II. Foundations and Site Work
   1. Foundation loads
   2. Foundation settlement
   3. Soil types and properties
   4. Excavation and support
   5. Shallow (spread) foundations
   6. Deep (pile) foundations
   7. Dewatering

III. Concrete Construction
   1. History
   2. Cement and aggregate
   3. Mixing
   4. Formwork
   5. Placement
   6. Reinforcing
   7. Prestressing and posttensioning
   8. Problems in concrete quantities

IV. Masonry Construction
   1. History
   2. Mortar
   3. Brick masonry
4. Concrete block masonry  
5. Stone masonry  
6. Construction techniques

V. Structural Steel Frame Construction  
1. History of steel and metals in construction  
2. Steel, the material  
3. Details of steel framing  
4. The fabrication and erection process  
5. Fireproofing of steel framing  
6. Longer spans in steel

VI. Interior Walls and Partitions  
1. Types of interior walls  
2. Framed partition systems (steel studs)  
3. Masonry partitions  
4. Wall and partition facings (gypsum board)

VII. Roofing  
1. Low-slope (Aflat®) roofs  
2. Components of roof systems  
3. Roofing and the building codes

VIII. Exterior Finish and Cladding  
1. The glass process and design  
2. Design requirements for cladding  
3. Watertightness in cladding  
4. Curtain wall design  
5. Energy requirements

Q. **LABORATORY OUTLINE:**

1. Introduction lab safety/length measure and units conversion.  
2. Practice layout of small commercial building for excavation of foundation.  
3. Area and volumes computations  
4. Fundamentals of concrete mixing and quality testing  
5. Form work - comparison between manufactured and job built forms.  
6. Compressive tests and strength analysis in concrete  
8. Field Trip - Block and Batch Plant  
10. Erect steel frame building  
11. Field Trip - Steel Fabricator  
12. Wall framing using metal studs  
13. Interior finish on metal studs with hollow metal frames and sheetrock  
14. Blueprint Reading - construction systems  
15. Review for Final Exam