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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
CMGT 380 – Construction Materials

Created by: Adrienne Rygel

Updated by:

Canino School of Engineering Technology
Department: Civil and Construction Technology
Semester/Year: Fall 2020
A. **TITLE:** Construction Materials

B. **COURSE NUMBER:** CMGT 380

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

# Credit Hours: 2
# Lecture Hours: 2 per week
# Lab Hours: per week
Other: 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:**

This course examines properties, common applications and methods for properly selecting and utilizing the materials typically used in the constructed environment. The materials studied include aggregates, Portland cement concrete, masonry, and asphalt. Significant time will be given to aggregate testing and data analysis for use in concrete and concrete mix design.

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

15 credits earned and MATH123 Pre-Calculus or higher; or permission of instructor

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

CMGT 381 Construction Materials Laboratory
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</th>
<th>Program Student Learning Outcome</th>
<th>GER If Applicable</th>
<th>ISLO &amp; SUBSETS</th>
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</thead>
<tbody>
<tr>
<td><strong>a)</strong> Discuss the significant properties, preparation and applications of aggregate, concrete, asphalt and masonry in the constructed world.</td>
<td>SO 5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<tr>
<td><strong>b)</strong> Analyze and interpret results from aggregate tests (e.g. sieve analysis, unit weight, moisture content, specific gravity)</td>
<td>SO 3 and 5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td><strong>c)</strong> Prepare a mix design for concrete.</td>
<td>SO 5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<tr>
<td><strong>d)</strong> Explain the types of fresh concrete tests used for quality control (e.g. slump/spread test, unit weight, temperature, air content)</td>
<td>SO 5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td><strong>e)</strong> Explain methods for proper placement, finishing, and curing of concrete.</td>
<td>SO 5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<tr>
<td><strong>f)</strong> Explain the types of hardened concrete tests and interpret test results (e.g. compressive and tensile strength tests).</td>
<td>SO 5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td><strong>g)</strong> Discuss types, application, and testing associated with masonry units.</td>
<td>SO 5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td><strong>h)</strong> Discuss types, application, and testing associated with hot asphalt in highway engineering.</td>
<td>SO 5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td><strong>i)</strong> Compose an Engineering Research Report regarding a construction topic using appropriate syntax and grammar.</td>
<td>SO 1</td>
<td>1-Comm Skills ISLO ISLO</td>
<td>W Subsets Subsets Subsets</td>
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<td><strong>j)</strong> Prepare and present an oral presentation regarding a construction topic with appropriate visual aids.</td>
<td>SO 1</td>
<td>1-Comm Skills ISLO ISLO</td>
<td>O Subsets Subsets Subsets</td>
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<td>ISLO #</td>
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</table>
| 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:**


L. **REFERENCES:**

Portland Cement Association Material Handbook

M. **EQUIPMENT:** None ☒ Needed:

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

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

Assignments, Exams, In-Class Exercises and Quizzes, Written Report(s), and Oral Presentation(s)

P. **DETAILED COURSE OUTLINE:**

I. Introduction and Overview

II. Aggregates
   A. Sources
   B. Uses
   D. Properties
   E. Testing
   F. Handling

III. Portland Cement
   A. Production
   B. Chemistry
   C. Types of cement

IV. Portland Cement Concrete
   A. Water
   B. Admixtures
   C. Proportioning mixes
   D. Fresh Concrete Tests for Quality Control
   E. Mixing placing and handling
   F. Curing
   G. Properties of hardened concrete
   H. Testing of hardened concrete
   I. Modern alternatives and innovations

V. Masonry
   A. CMUS
   B. Clay bricks
   C. Mortar
D. Grout
E. Plaster

VI. Asphalt Binders and Mixtures
A. Types and uses of Asphalt
B. Thermal and chemical considerations
C. Performance characterization
D. Classifications of asphalt
E. Asphalt concrete
F. Mix Design
G. Characterization
H. Production
I. Recycling
J. Additives

Q. LABORATORY OUTLINE: None ☒ Yes ☐