

**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:

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

KEY	<u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
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:

Mamlouk, Michael S. and Zaniewski, John P. (2017). Materials for Civil and Construction Engineers, 4th edition, Pearson Publishing.

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