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



# MASTER SYLLABUS

### **COURSE NUMBER – COURSE NAME** CMGT 308 – Renewable and Sustainable Materials

**Created by: Adrienne Rygel** 

Updated by:

**Canino School of Engineering Technology** 

**Department:** Civil and Construction Technology

Semester/Year: Fall 2020

A. <u>TITLE</u>: Renewable and Sustainable Materials

### B. <u>COURSE NUMBER</u>: CMGT 308

C. <u>CREDIT HOURS</u>: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

# Credit Hours: 3
# Lecture Hours: 3 per week
# Lab Hours: per week
Other: per week

Course Length: 15 Weeks

**D.** <u>WRITING INTENSIVE COURSE</u>: Yes  $\square$  No  $\boxtimes$ 

E. <u>GER CATEGORY</u>: None: Yes: GER *If course satisfies more than one*: GER

# F. <u>SEMESTER(S) OFFERED</u>: Fall Spring Fall & Spring

## G. <u>COURSE DESCRIPTION</u>:

This course examines renewable and sustainable materials being used today in the construction industry. Students learn about the history and evolution of materials used in construction; and about the new sustainable materials available in today's market (types of materials, material application and selection, material performance, installation, service life, and maintenance). Students learn how to conduct cost-benefit analysis on different renewable and sustainable materials when deciding whether to use these materials in a project. Sourcing and planning for these materials is reviewed. Additional topics are: sustainable building design using green materials and methods and technologies for construction of sustainable transportations systems, including roads, bridges, tunnels, and hardscapes, as well as water, storm, and wastewater systems.

# H. <u>PRE-REQUISITES</u>: None Yes X If yes, list below:

CMGT 371 Statics and Strength of Materials for Construction or CONS 272 Strength of Materials for Technicians or ENGS 203 Engineering Strength of Materials; or permission of the instructor

<u>CO-REQUISITES</u>: None Yes I If yes, list below:

# I. <u>STUDENT LEARNING OUTCOMES</u>: (see key below)

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

<u>Course Student Learning Outcome</u> [SLO]	Program Student Learning Outcome [PSLO]	<u>GER</u> [If Applicable]	<u>ISLO &amp; SUBSETS</u>
a. Discuss the history and evolution of construction materials.	SO 5		5-Ind, Prof, Disc, Know Skills Subsets ISLO Subsets ISLO Subsets Subsets
b. Describe the types of sustainable and renewable construction materials.	SO 5		5-Ind, Prof, Disc, Know Skills Subsets ISLO Subsets ISLO Subsets Subsets
c. Select appropriate sustainable materials for different construction applications.	SO 5		5-Ind, Prof, Disc, Know Skills Subsets ISLO Subsets ISLO Subsets Subsets
d. Explain installation methods and procedures for different green technology building systems.	SO 5		5-Ind, Prof, Disc, Know Skills Subsets ISLO Subsets ISLO Subsets Subsets
e. Explain sustainable approaches in residential and commercial design, including the design of buildings, transportation systems, and municipal water/wastewater systems.	SO5		5-Ind, Prof, Disc, Know Skills Subsets ISLO Subsets ISLO Subsets Subsets
f. Explain sustinable approaches in rural and urban planning.	SO 5		5-Ind, Prof, Disc, Know Skills Subsets ISLO Subsets ISLO Subsets Subsets
g. Conduct a cost benefit analysis for a project using a sustainable approach to design and/or construction.	SO 5 and 8		5-Ind, Prof, Disc, Know Skills Subsets ISLO Subsets ISLO Subsets Subsets

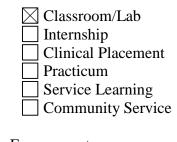
KEY	Institutional Student Learning Outcomes [ISLO 1 – 5]
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS]
3	<b>Foundational Skills</b> Information Management [IM], Quantitative Lit,/Reasoning [QTR]
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

#### APPLIED LEARNING COMPONENT: J.

Yes 🖂 No

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



Civic Engagement Creative Works/Senior Project

Research

Entrepreneurship

(program, class, project)

# K. <u>TEXTS</u>:

Hossain, Faruque Md., (2018). "Sustainable Design and Build: Building, Energy, Roads, Bridges, Water and Sewer Systems." Elsevier. 462 p. ISBN 13: 9780128167229.

## L. <u>REFERENCES</u>:

Yhaya, Mohd Firdaus; Tajarundin, Husnul Azan; and Ahmad, Mardiana Idayu (2018). "Renewable and Sustainable Materials in Green Technology", Springer Briefs in Applied Sciences and Technology, Springer, ISBN 13:978-3-319-75121-4.

# M. <u>EQUIPMENT</u>: None Needed:

# N. **<u>GRADING METHOD</u>**: A-F

# 0. <u>SUGGESTED MEASUREMENT CRITERIA/METHODS</u>:

**Assignments and Exams** 

### P. <u>DETAILED COURSE OUTLINE</u>:

- 1. History and Overview of Construction Materials
- 2. Evolution of Construction Materials
- 3. Sustainable and Renewable Materials
  - a. Available materials
  - b. Material selection and application
  - c. Material performance
  - d. Sourcing and planning
  - e. Installation and maintenance
- 4. Advanced Sustainable Building Design
  - a. Sustinable building materials
  - b. Design and Light Engineering
  - c. Energy Modeling
  - d. Rural vs Urban Development
  - e. Sustinable approach to Residential and Commercial Design
  - e. Smart building technology
- **5.** Sustainable Transportation Systems
  - a. Roads
  - b. Bridges
  - c. Tunnels
- 6. Water Systems
- 7. Green Storm and Wastewater Systems
- 8. Cost Benefit Analysis
- 9. Management and Planning

# Q. <u>LABORATORY OUTLINE</u>: None X Yes