

**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. **TITLE:** Renewable and Sustainable Materials
- B. **COURSE NUMBER:** CMGT 308
- C. **CREDIT HOURS:** (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. **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 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. **PRE-REQUISITES:** None Yes 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

CO-REQUISITES: None Yes If yes, list below:

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 history and evolution of construction materials.	SO 5		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
b. Describe the types of sustainable and renewable construction materials.	SO 5		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
c. Select appropriate sustainable materials for different construction applications.	SO 5		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
d. Explain installation methods and procedures for different green technology building systems.	SO 5		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets 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 ISLO ISLO	Subsets Subsets Subsets Subsets
f. Explain sustainable approaches in rural and urban planning.	SO 5		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets 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 ISLO ISLO	Subsets 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:

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

L. REFERENCES:

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. EQUIPMENT: None Needed:

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Assignments and Exams

P. DETAILED COURSE OUTLINE:

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. Sustainable building materials
 - b. Design and Light Engineering
 - c. Energy Modeling
 - d. Rural vs Urban Development
 - e. Sustainable 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. LABORATORY OUTLINE: None Yes