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 transportation 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:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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</thead>
<tbody>
<tr>
<td>a. Discuss the history and evolution of construction materials.</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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<td>b. Describe the types of sustainable and renewable construction materials.</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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<td>c. Select appropriate sustainable materials for different construction applications.</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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<td>d. Explain installation methods and procedures for different green technology building systems.</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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<td>e. Explain sustainable approaches in residential and commercial design, including the design of buildings, transportation systems, and municipal water/wastewater systems.</td>
<td>SO5</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td>f. Explain sustainable approaches in rural and urban planning.</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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<td>g. Conduct a cost benefit analysis for a project using a sustainable approach to design and/or construction.</td>
<td>SO 5 and 8</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td>ISLO #</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
<td>ISLO &amp; Subsets</td>
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<tr>
<td>1</td>
<td>Communication Skills</td>
<td>Oral [O], Written [W]</td>
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<tr>
<td>2</td>
<td>Critical Thinking</td>
<td>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
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<td>3</td>
<td>Foundational Skills</td>
<td>Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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<td>4</td>
<td>Social Responsibility</td>
<td>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</td>
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<td>5</td>
<td>Industry, Professional, Discipline Specific Knowledge and Skills</td>
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*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:


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 ☐