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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
AREA 324 – SUSTAINABLE CONSTRUCTION

Created by: Cullen Haskins

Updated by:

Canino School of Engineering Technology

Department: MECHANICAL AND ENERGY TECHNOLOGY

Semester/Year: FALL 2020

A. **TITLE**: SUSTAINABLE CONSTRUCTION

B. **COURSE NUMBER:** AREA 324

C. **CREDIT HOURS: 3 credit hour(s) per week for 15 weeks**

☒ One hour (50 minutes) of lecture per week 3
☐ Two to three hours of lab or clinical per week
☐ Two hours of recitation per week
☐ 40 hours of internship

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 is an introduction to sustainable building design. It focuses on the application of building science to the design and construction of durable and functional buildings that optimize the balance between operating costs, construction costs, and life-cycle carbon footprint

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

Junior Level Status or Permission of 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:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
A. Demonstrate an understanding of the building science principles underpinning the development of air-tight, functional, and resilient wall and roof assemblies			2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	PS Subsets Subsets Subsets
B. Demonstrate an ability to develop assemblies that comply with code standards to provide for occupant health and comfort			2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	PS Subsets Subsets Subsets
C. Estimate annual energy loads and carbon footprint based on assembly and equipment specifications, and energy sources			2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA Subsets Subsets Subsets
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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	**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:

Lstiburek, J. (2000). A Builders Guide to Cold Climates. Newtown, CT: The Taunton Press.

Green Building Advisor – https://greenbuildingadvisor.com

Whole Building Design Guide - https://www.wbdg.org/

M. EQUIPMENT: None ☒ Needed:

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Homework, Quizzes, Exams, and Projects

P. DETAILED COURSE OUTLINE:

1. Optimize Occupant Health/Comfort
- **a. Humidity and temperature (psychrometric chart and ASHRAE recommended comfort zone)**
- **b. Benefits of natural lighting**
- **c. Elimination of air leaks (drafts)**
- **e. Indoor pollutants and off-gassing**
- **f. Ventilation - code requirements**

2. Create Buildings that don't Self-Destruct Prematurely – Building Science Basics
- **a. Structural – make a building that meets code requirements**
- **b. Moisture concerns – principles governing moisture movement in walls**
- **c. Ice dams and condensation – understanding how roof assemblies perform**
- **d. Air Sealing as a method of controlling moisture movement in wall and roof assemblies**

3. Minimizing Construction Costs (fiscal and carbon footprint)
- **a. Choose materials with good value, not just good properties**

b. Minimize complexity of construction

4. Minimize Operating Costs (energy consumption)
   a. Insulation to reduce heat loss
   b. Air Sealing to reduce heat loss
      i. Ventilation - methods for satisfying code requirements
   c. Window selection for sustainble construction
   d. Mechanical equipment selection for high efficiency buildings
5. Minimizing Life-Cycle Carbon Footprint
   a. Sustainable materials selection
   b. Eco-friendly materials selection
   c. Utilization of local materials
   d. Utilization of recycled materials
   e. Optimization of material usage
   f. Designing and constructing buildings worth keeping

Q. LABORATORY OUTLINE: None ☒ Yes ☐