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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
CONS 368 - BUILDING ELECTRICAL AND MECHANICAL SYSTEMS

Created by: Joseph Reilly

Updated by: Michael J. Newtown, P.E.

Canino School of Engineering Technology
Department: Civil and Construction Technology
Semester/Year: Fall 2018
A. **TITLE**: BUILDING ELECTRICAL AND MECHANICAL SYSTEMS

B. **COURSE NUMBER**: CONS368

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**: 

   An introduction to the major components that comprise the electrical and mechanical (HVAC) systems in a commercial building. Students study and interpret construction plans associated with these systems. Water supply, waste, drain and vent calculations are performed. Students are required to perform heat and energy calculations. Issues that impact building environmental health and indoor air quality are presented. Alternative energy approaches to heating, cooling and providing power to buildings are introduced.

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

   MATH 123 PreCalculus

   **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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<tbody>
<tr>
<td>Explain in general technical terms the components that make up a building mechanical and electrical systems.</td>
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<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
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<td>Interpret the mechanical and electrical prints from a set of building plans.</td>
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<td>Size waste, drain and vent systems</td>
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<td>Perform a building heat load calculation</td>
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<td>Perform a building cooling load calculation</td>
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<td>ISLO #</td>
<td>ISLO &amp; Subsets</td>
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| 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:**

Building Electrical and Mechanical Systems 2nd Ed., Stein, Wiley Publishing

L. **REFERENCES:**


M. **EQUIPMENT:** None ☒ Needed:

N. **GRADING METHOD:** A - F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Homework, exams, research/design project, final exam

P. **DETAILED COURSE OUTLINE:**

I. Mechanical Systems
   A. D-W-V systems
      1. Water Supply
         a. Piping
         b. Pumps
      2. Waste Water
         a. Components
         b. Sizing sanitary drains
      3. Venting
         a. Materials
         b. Purpose
         c. Sizing Vents
      4. Storm Water
      5. Interpreting Pipe Drawings
   B. HVAC
      1. Heating Options
         a. Heat Load Calculations
b. Insulation and R-value
2. Ventilation
   a. Air handling Equipment
   b. Sizing duct work
3. Cooling and Conditioning
4. Cooling Load calculations
5. Interpreting HVAC Plans

II. Electrical Systems
   A. Interpreting Electrical Plans (drawings)
   B. Electric code issues
   C. Electrical Supply
      1. Wire and conduit
   D. Electrical Distribution Components
   E. Lighting Systems

III. Alternative Energy Applications
   A. Use of solar energy
      1. Passive
      2. Photovoltaic Electricity
   B. Use of geothermal
   C. DC-AC Inverters
   D. Research Paper

Q. **LABORATORY OUTLINE:** None ☒ Yes ☐