COURSE OUTLINE

CONS 368 - BUILDING ELECTRICAL AND MECHANICAL SYSTEMS

Prepared By: Joseph Reilly
CONS 368 - BUILDING ELECTRICAL AND MECHANICAL SYSTEMS

A. **TITLE:** BUILDING ELECTRICAL AND MECHANICAL SYSTEMS

B. **COURSE NUMBER:** CONS368

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** NO

E. **COURSE LENGTH:** 15 WEEKS

F. **SEMESTER(S) OFFERED:** TBA

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**

   3 – one hour lectures per week

H. **CATALOG 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.

I. **PRE-REQUISITES:** MATH 123 (PreCalculus)

J. **GOALS (STUDENT LEARNING OUTCOMES):**

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

<table>
<thead>
<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
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<tbody>
<tr>
<td>(a) Explain in general technical terms the components that make up a buildings mechanical and electrical systems.</td>
<td>3. Professional Competence</td>
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<td>1. Communication</td>
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<td>(b) Interpret the mechanical and electrical prints from a set of building plans.</td>
<td>3. Professional Competence</td>
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<td>1. Communication</td>
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<td>(c) Size waste, drain and vent systems</td>
<td>3. Professional Competence</td>
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<td>(d) Perform a building heat load calculation</td>
<td>3. Professional Competence</td>
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<td>(e) Perform a building cooling load calculation</td>
<td>3. Professional Competence</td>
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(f) Perform an electrical load calculation on a building

3. Professional Competence

(g) Suggest methods that contribute to “green” construction

3. Professional Competence
2. Critical Thinking

(h) Discuss several applications of the use of alternative energy in modern construction.

2. Critical Thinking
1. Communication

K. TEXT: An “e-book” is planned (a composite from several texts), Or, Building Electrical and Mechanical Systems 2nd Ed., Stein, Wiley Publishing


M. EQUIPMENT: No special equipment is required of the student.

N. GRADING METHOD: A - F

O. MEASUREMENT CRITERIA/METHODS:

It is suggested that the students’ grades be based on a combination of assigned problems and exams. A research/design project may be included. The instructor will decide the weight of each component. A comprehensive final exam may be included.

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: NA