COURSE OUTLINE

ACHP 415 – COMMISSIONING of MECHANICAL SYSTEMS

Prepared By: Michael J. Newtown, P.E.
Updated By: Michael J. Newtown, P.E.
A. TITLE: Commissioning of Mechanical Systems
B. COURSE NUMBER: ACHP 415
C. CREDIT HOURS: 3
D. WRITING INTENSIVE COURSE: NA
E. WEEKS PER SEMESTER: 15
F. SEMESTER(S) OFFERED: Fall/Spring
G. HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY: 3 – 1 hour lectures per week
H. CATALOG DESCRIPTION:

This course explores the modern building practice of implementing a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies. Students develop and analyze the owner’s project requirements and translate these requirements into a commissioning plan. Students will transform the commissioning plan into an operational and maintenance plan for the building owner and operators.

I. PRE-REQUISITES/CO-COURSES: Pre-requisite: ACHP 324, HVAC Load Calculation & Energy Code

J. STUDENT LEARNING OUTCOMES: Students will be able to:

<table>
<thead>
<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Evaluate building requirements and translate into a commissioning plan</td>
<td>2. Crit. Thinking</td>
</tr>
<tr>
<td></td>
<td>3. Prof. Competence</td>
</tr>
<tr>
<td>b. Articulate the roles of management and team members in commissioning</td>
<td>1. Communication</td>
</tr>
<tr>
<td></td>
<td>3. Prof. Competence</td>
</tr>
<tr>
<td>c. Determine the cost and savings based on a commissioning plan</td>
<td>2. Crit. Thinking</td>
</tr>
<tr>
<td></td>
<td>3. Prof. Competence</td>
</tr>
<tr>
<td>d. Demonstrate in a portfolio all documentation necessary to commissioning a building</td>
<td>1. Communication</td>
</tr>
<tr>
<td></td>
<td>3. Prof. Competence</td>
</tr>
</tbody>
</table>

K. TEXTS: Instructor developed material


M. EQUIPMENT: Technology enhanced classroom

N. GRADING METHOD: A – F

O. MEASURE CRITERIA/METHODS:
   • Homework
   • Exams
   • Oral Presentation/ Research Paper/Research Project
   • Portfolio

P. DETAILED TOPICAL OUTLINE:

   I. Commissioning objectives
      A. Building owners requirements
      B. Occupant requirements
      C. Operator/ maintenance requirements
      D. Verifying design compliance

   II. Management and responsibilities
      A. Pre design
      B. Construction
      C. Team members and roles
      D. Post construction

   III. Commissioning Phases
      A. Pre-design phase activities
      B. Design phase activities
      C. Construction phase activities
      D. Occupancy and operation phase activities

   IV. Cost of commissioning
      A. Design phase
      B. Construction phase
C. Occupancy phase

V. Existing Building re-commissioning or retro-commissioning
   A. Process
   B. Documentation
   C. Cost
   D. Objectives for older buildings

VI. Case Studies
   A. Discussions of problems and successes in commissioned building
   B. Student developed commissioning plan for new building
   C. Student developed plan for older buildings
   D. Guest lectures by practicing engineers who perform commissioning
   E. Field trips to see commissioning in action