MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 456: HVAC Air and Water Distribution System Design (4) Required for HVAC&R Concentration, Elective for all others

Course Description: (2013-15 Catalog) Air and water distribution components and systems and the design of these systems with applications to the heating, ventilating and air-conditioning (HVAC) industry. 3 lectures, 1 laboratory.

Prerequisite Courses: ME 302, ME 347

Prerequisites by Topic: Coverage of all topics presumes completion of basic engineering science courses in thermodynamics and fluid mechanics.

Textbooks: (and/or other required material)

Carrier System Design Manual, Chapter 2: Air Distribution, Carrier Corporation, Syracuse, New York.

Carrier System Design Manual, Chapter 3: Piping Design, Carrier Corporation, Syracuse, New York.

Course Coordinator/Instructor: Jesse Maddren, Professor of ME

Course Learning Outcomes:

1. To improve understanding of HVAC components and systems.
2. To improve understanding of professional practice in the HVAC industry.
3. To be able to design a basic HVAC system, including:
   a. equipment selection
   b. air distribution and exhaust
   c. water distribution
   d. plumbing
   e. natural gas distribution
   f. presentation of the design in a professional format
   g. design specifications

Relationship of Course to MECHANICAL ENGINEERING Program Outcomes:												
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*
M	**L**	**H**	**L**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**H**	**M**

Topics Covered: (recommended number of hours each)

1. Introduction, design process (2 lecture)
2. HVAC system types and selection (3 lectures)
3. Duct design (3 lectures)
4. Grilles and registers (2 lecture)
5. System design topics (3 lectures)

6. Hydronic system design (2 lectures)
7. Introduction to plumbing systems (2 lectures)
8. Natural gas piping design (1 lecture)
9. HVAC controls (1 lecture)
10. Design project (4 lectures)
11. Guest speakers (possible topics): LEED/Cal Green, HVAC controls, Career paths in HVAC, etc. (4 lectures)
12. Field trips (3 lectures)

Laboratory Projects:

1. CAD for HVAC system design (3 weeks)
2. Lab equipment tour (1 week)
3. Guest speakers (examples): sound and vibration in HVAC systems, radiant heating and cooling, etc. (1 week)
4. Design project (5 weeks)

Class/Lab Schedule: Three 50-minute lectures per week, one 170-minute lab per week

Contribution of Course to Meeting the Professional Component:

(a) College-level mathematics and basic sciences:	0 credits
(b) Engineering Topics:	4 credits
Design	3 credits
(c) General Education:	0 credits
(d) Other:	0 credits

Prepared by: Jesse Maddren **Date:** 4/4/14