



Philadelphia University

Faculty of Engineering and Technology - Department of
Mechanical Engineering
E-Learning Syllabus

Course Information

Title: Sanitary Systems Design (620532)

Prerequisite: Fluid Mechanics I (620320)

Credit Hours: 3 credit hours (15 weeks per semester, approximately 44 contact hours)

Textbook: BUILDING SERVICES HANDBOOK Fifth edition F. Hall and R. Greeno
Butterworth-Heinemann is an imprint of Elsevier Ltd,2009

References: Plumbing Technology, By F. Hall, R. Greeno, 2009. Butterworth-Heinemann
is an imprint of Elsevier Ltd,

**Catalogue
Description:**

This course introduces knowledge and awareness for mechanical engineering students of the importance of mechanical systems design and its applications in practice. To present Basic definitions and terms of buildings and their mechanical systems economics, cold water supply, plumping materials and fittings, hot water supply, heating and cooling systems system, pipe sizing, fir fighting network and systems, ventilation system and finally to develop an intuitive understanding of mechanical systems.

Instructor: **Eng. Nadia Badarneh**
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Course Topics:

| Week | Topic |
|-------|---|
| 1 | Basic definitions and terms. Introduction to in buildings and their mechanical systems economics. |
| 2-3 | Cold water supply, plumping materials and fittings. |
| 4-5-6 | Hot water supply. |
| 7-8 | Heating System |
| 9-10 | Under floor heating Design |
| 11-12 | Pipe sizing |
| 13-14 | Firefighting networks and systems. |
| 15 | Ventilation |

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| 16 | Review, and final exam |
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ABET Student Outcomes (SOs)

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|---|--|
| 1 | An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics |
| 2 | An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors |
| 3 | An ability to communicate effectively with a range of audiences |
| 4 | An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts |
| 5 | An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives |
| 6 | An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions |
| 7 | An ability to acquire and apply new knowledge as needed, using appropriate learning strategies |

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should be able to:

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|---|--|---------|
| 1 | Understand the Basic concept of hot and cold water supply | [1, 2] |
| 2 | Understand the concepts of mechanical systems and their economics. | [1, 2] |
| 3 | Understand the concept of HVAC fundamentals, drainage systems & sanitary appliances. | [1, 2] |
| 4 | Apply the Above mentioned three basic concepts and to understand their advantages | [1, 2] |
| 5 | Classify of heating production equipment and systems | [1, 2] |
| 6 | Understand how to make a design of cold and hot water supply and pipe sizing | [1, 2] |
| 7 | Understand firefighting system how to make a design and pipe sizing | [1, 2] |
| 8 | Prepare and design a project in one of the topics mentioned above using a software such as HAP and Revit | [3,5,7] |

Assessment Instruments:

Evaluation of students' performance (final grade) will be based on the following categories:

Exams: Mid exam will be given which cover about 6-weeks of lectures

Quizzes: 10-minute quizzes will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s).

Homework: Problem sets will be given to students. Homework should be solved individually and submitted before the due date.

Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero mark for that homework

Presentation: Prepare and organize a project in one of the topics that discussed in the course as a team work using a software such as HAP and Revit, questions will be asked during presentation and the student is assessed based on his/her response.

Final Exam: The final exam will cover all the class material.

Grading policy:

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|---------------------------------|------|
| Mid Exam | 30% |
| Home works, Quizzes and Project | 30% |
| Final Exam | 40% |
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| Total: | 100% |

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.