

Control Water Temperature of the Shower

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Type: Design problem
Time: 6 weeks
Location: Take home

Summary

This project is intended for a first year engineering class. Students will be distributed to groups of four. The project is to create a conceptual design of a mechanism to control the water temperature of a shower. This can be interpreted as the need to set a temperature range of 5 C. The cold and hot water streams are mixed and deliver a stream of preset temperature. This mechanism may be needed for older people and small children. There will be a design review meeting with the instructor after three weeks. The final report will be submitted and an oral presentation made after six weeks.

ABET Descriptors

Engr Sci Content: First year engineering
Type: System, component
Elements: Analysis, construction, testing, evaluation
Features: Problem definition, creativity, consideration of alternatives,
design methodology, open-ended
Constraints: Time, Safety, Cost
Effort: Team

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Background:

The class will be divided into teams of four students. The design group will create a mechanism to deliver the two streams of cold and hot water in one stream at preset temperature. The design is to be simple. The amount of water that may be delivered in one usage is 5 liters.

Report:

The project is to be reported in both written and oral presentation form. The students' team is expected to report the current existing technologies search, development of system schematic diagrams, and description of proposed system with explanation of role of each system component. A cost analysis of the proposed system will be attached with different alternatives of construction., All members of students' team is expected to participate in oral presentation to show his role in the project.

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Engineering Notes:

This project is intended to encourage students to work in a team to satisfy design objects with time and cost constraints.

The student should make note of

- The team should make a comprehensive search of the current mechanisms available.

- Try to keep the design simple and within reasonable cost.

- To report different design schemes considered.

- The students may consider three different temperature set-ups. The amount of water delivered can be in the range of five liters.

A further application of this mechanism can be in great depth in thermodynamics, heat transfer, fluid mechanics, and capstone design.