

Accessible Kitchen

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Type: Design
Student Time: Semester Project
Location: Take home

Summary

This exercise is to be used in a first year engineering course as a semester project. It is intended to expose the student to a variety of design considerations, written and oral communication skills and team work. Students work in small groups (3-4) to investigate and design a kitchen for those confined to a wheelchair. The kitchen is to contain the normal work triangle (stove, sink, refrigerator). However, the triangle and other features are to be operated/used from the wheelchair. The kitchen is to be designed for use by a paraplegic (someone who has use of their upper body).

The groups are to complete their project by submitting a set of drawings and specifications. An oral presentation using visual aids is also to be performed by each group.

Follow up course work may include constructability analysis, cost analysis, and marketing opportunities.

ABET Descriptors

Engr Sci Content: First Year Engineering, Construction Engineering
Type: Design
Elements: Statistics, human factors, cost analysis, communication,
construction
Features: Design, Creativity, open-ended, alternative solutions
Constraints: ADA (Americans with Disabilities Act) requirements, building
codes, time, economics, human factors
Effort: Team

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The class is to be divided into teams of three to four people.

As everyone says “people seem to congregate in the kitchen”. It is a diverse room with many functions, purposes, and uses. The groups are to begin by investigating the work triangle system within their own home and develop a design to improve upon its usage. Yes! Re-design your kitchen.

Next, design a kitchen layout to accommodate a wheelchair. Remember everything is to be 100% (or as much as possible) available from the confines of the wheelchair. Design the kitchen for use by a paraplegic, having upper body movement. The library has a number of resources including the ADA (Americans with Disabilities Act) Codes.

Evaluation Criteria:

Engineering Drawings (AUTOCAD)

Oral Report (Participation by all team members, visual aids required)

Written Report (Word Processor)

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Engineering Notes:

The instructor may want to divide the project into sections which would introduce the project in pieces. Some suggestions include:

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- Human Factors
- Kitchen Layout
- the work triangle = sink, stove, and refrigerator
- Building Codes
- ADA Requirements

Things to remember in designing for a wheelchair include:

- Height and reach constraints
- Visibility
- Opening of cupboard, refrigerator, and oven doors into the chair
- Placement of faucet controls
- Dishwasher doors

The project can be modified in many ways. Suggestions include:

- Limiting the space
- Limiting the cost
- Rather than a new kitchen, are there devices to modify an existing kitchen?

Note: "Home Architect" type software packages are now readily available to support the design layout portion of this project.