

Classroom Desk

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Type: Design
Length: 2 weeks
Location: Part I: In-class. Part II: Take Home

Summary

This project is for use in a first year engineering course with follow-up exercises in statics, strength of materials, and structural analysis courses. Students work individually or in small groups (2-3) to produce engineering drawings of their re-designed classroom desk.

The desk which currently occupies your classroom has an insufficient work space. The student is to evaluate the needs of the classroom situation and redesign the desk to accommodate a notebook, a pad for note taking, a calculator, and possibly a computer. Analysis is to include cost constraints, fire code considerations (maximum number of desks per 100 square feet), economics (minimum number of desks), aesthetics, and human factors.

The student is to develop a sketch of the new desk, prepare a written document describing the design considerations and give an oral presentation with visual aids.

ABET Descriptors

Engr Sci Content: First Year Engineering
Type: Component
Elements: Human factors, establishment of objectives and criteria, analysis, evaluation
Features: Creativity, design, open-ended, communication, code review, economics, safety
Constraints: Economics, human factors, application, time
Effort: Team

Classroom Desk

Memorandum

To: Engineering Students
From: Facilities Management Department
Subject: Classroom Desks

It has been brought to the attention of the Facilities Management Department that the Engineering student body is unhappy with the design of their classroom desks. It is understood that the current desk does not provide sufficient space to take notes during lectures and/or take exams. After looking through various catalogs we have been unable to locate a classroom desk which would fill the requirements stated in the letter received from your student senate officers (wish list is shown below). Therefore, since we have the capabilities here on campus to manufacture an appropriate desk, we are asking for your designs, cost analysis, and feasibility reports to assist us in developing a prototype desk for your approval. Please submit your designs and supporting documents within two weeks.

Fire code safety procedures must be satisfied for classrooms. We are to follow the codes as to the number of desks per classroom size and to maintain aisle spacing. Therefore, within your documents please supply us with the number of desks allowed per room and the desk placement configuration.

Suggestions: Allow enough work surface to include the following:

(Wish List)

- an open 3 ring notebook
- a pad for taking notes
- a calculator
- a straight edge
- an eraser
- and possibly a computer

Evaluation Criteria:

- A sketch of the new desk. Engineering drawing preferred. (Autocad)
- List of materials (Spreadsheet)
- List of material costs (Spreadsheet)
- Oral report (participation by all team members, visual aids required)
- Supporting report (word processor)

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Engineering Notes:

The class will divide into teams of 3-4 students.

Part I:

As a class: Determine statistical values on human factors for the desk.
Determine statistically the desired attributes (space, placement of objects, etc).

Part II:

Teams: Develop an engineering drawing of the new desk with supporting documentation.

Notes: Economics is of concern. You may want to place a dollar value on an individual desk.

Remember there is a need for both right and left handed desks. (If they need to be different.)

The desk should resist weight of a person sitting on the work surface.

Follow-up courses:

Analyze the forces needed to maintain a proper friction force on the floor surface

Analyze the forces on the legs, seat and table top of the new desk.

Material strengths and structural analysis.