IE 478 Syllabus for Facilities Design and Material Handling—Spring 2009
Instructor Prof. Leon Cox
EC3-rm 105

Grade Distribution: proposed
2 Tests @ 20% each
1 Project @ 60%
Guaranteed : A = > 90%, B = > 80%, C = > 65%, D = > 55%

Textbook:
Pdf book available here: http://www.strategosinc.com/buy0_facdes.htm
Facilities & Workplace Design: An Illustrated Guide
by Quarterman Lee, Arild Amundsen, William Nelson & Herbert Tuttle
With Updated Chapters On Workcell & Workstation Design

References:
1. Facilities Planning by Tompkins, White and al. , New York: John Wiley & Sons, 1996, Second Edition (Later editions are available)
2. Systematic Layout Planning by Muther

Periodicals:

1. Modern Materials Handling
2. Material Handling Engineering
3. Production Engineering (formerly Automation)
4. IIE SOLUTIONS

Course learning objective: To present students with relevant issues in facility planning and material handling that should enable them to evaluate facilities requirements, develop alternatives solutions, select and implement the most suitable ones.

Course Learning Outcomes:

1. Introduce facility planning and material handling concepts and methods

2. Introduce analytical approaches to plant layout problem

3. Discuss computerized models and solutions to the facility layout problem

4. Introduce facility location models

5. Introduce warehouse operations techniques

Topics: Proposed—

1. **Strategic Facilities Planning**: significance of facilities planning strategies; facilities planning process; examples of inadequate planning.

2. **Product and Process design:** identifying and selecting required processes based on schedule design and facility design.

3. **Material Flow & Activity Relationships:** departmental planning; layout and material flow classification; flow measuring; space requirements; material handling.

4. **Facility Layout Design:** Layout procedures; Systematic Layout Planning; algorithmic approaches: Relationship Diagramming, Pair wise Exchange Method, Graph based Method. **(Muther)**

5. **Warehouse Planning:** dedicated storage location policy; randomized storage location policy; order picking.

6. **Green Building:** deciding to build or remodel using such resources as Leadership in Energy and Environmental Design (LEED). A field trip to Masson Radium Springs Geothermal Greenhouse is planned. http://geoheat.oit.edu/bulletin/bull23-4/art9.pdf

Project:
Each student is required to participate in a group for the development of a facility design project approved by the instructor and then write a detailed paper (> 15 pages in double space are recommended) as well as present it in class. This will be detailed during the first two weeks of class.
A list of suggested research topics is can be found below. These topics are useful to research and would be included as knowledge within the project paper. Each student in the group will be required to research and prepare information in the project paper.
In addition to the Instructor's evaluation and assessment, peer evaluation and assessment will also be used as instructed in the class.

Possible Research Topics:
Facilities Design:
  Restaurant Design
  Production Facility Design
Office Design:
  Designing a Virtual Office.
  Designing Modular Offices.
Warehouse Design:
  CICMH Design Contest

Specifics on the Project
1. You must use at least five current sources (since January 2000) for your project.
   Books are not included in this requirement, (go to the library), *see Periodicals above.
2. You must reference all your sources appropriately in the body of the paper as well as a bibliography.
NOTE: If you take several sentences (even if put in your own words) from a source you must reference the source.
3. Use margins of 1 inch on all four sides, Times New Roman or equivalent font in 12 point size, and double space the text. It is helpful to number the pages.
4. Assemble the paper as follows:
Title page, make sure all members names appear (unless they did not participate).
Executive Summary or Abstract of no more than ½ page in length.
Table of contents (with page numbers).
Your written project.
A list of data sources as appendices along with your references.
Attach layout drawings or CAD output.
Attach any work sheets (i.e. From/To charts, etc.) as appendices as well.