

IE-650 MATERIAL FLOW SYSTEMS
Fall 2008

Class Room: Sackett Hall 001
Class Hours: Tue and Thu 4-5:15 pm
Instructor: Sunderesh Heragu, Speed 200
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Teaching Assistant: Mehdi Zakerifar
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TA Office Hours: As needed

Catalog Course Description

Material handling and equipment concepts; computerized plant layout; problem formulation; requirements definition; queuing; location analysis; conveyor theory; simulation; developing and evaluating alternative systems; systems implementation. Pre-requisites: IE 516 (Operations Research II or equivalent) Fall term 3 credit hours

Objective

The primary objective of this course is to teach mathematical modeling and solution of facility design problems such as layout, material handling systems design and planning, storage and warehousing, group technology and cellular manufacturing system design. Emphasis will be on newer models and solution techniques.

Required Text

Facilities Design, (3rd edition), Sunderesh S. Heragu, CRC Press, Boca Raton, FL 2008
The required software is available at the website provided above.

Reference

R.G. Askin and C.R. Standridge, *Modeling and Analysis of Manufacturing Systems*, John Wiley & Sons, New York, NY, 1993.
R.L. Francis, L.F. McGinnis, and J.A. White, *Facility Layout and Location: An Analytical Approach*, 2nd. edition, Prentice Hall, Englewood Cliffs, NJ, 1992.
D.R. Sule, *Manufacturing Facilities: Location, Planning and Design*, 2nd edition, PWS Publishing Co., Boston, MA, 1994.
J.A. Tompkins, J.A. White, Y.A. Bozer, and J.M.A. Tanchoco, *Facilities Planning*, 3rd edition, Wiley, New York, NY, 2003.

Grading Scheme

Assignments	25%
Exam #1	25%
Exam #2	25%
Project	25%
Grand Total	100%

Final grades will be determined based on the schedule outlined on the right and there will be no deviation from the specified grading policy.

<u>Grand Total</u>	<u>Grade</u>
97-100	A+
94-96	A
91-93	A-
87-90	B+
84-86	B
81-83	B-
77-80	C+
74-76	C
71-73	C-
67-70	D+
64-66	D
61-63	D-
60 and below	F

Project Work

Project for this course may be done individually or in a group with no more than 2 students per group. Students should identify a suitable project topic, prepare and submit a one-page abstract of the project to be undertaken no later than **September 9, 2008**. Before beginning work on a project, students must obtain approval from the instructor. A mid-term project report is due on **October 16, 2008**. Completed projects are due on or before, but not later than, **December 9, 2008**. All projects require written reports and may have to be formally presented in the final week.

Grading

Any questions regarding grading of exams and homework must be submitted in writing (immediately after the class in which the graded exams and homework are given back to the students) to the TA directly or through the instructor. Neither the TA nor the instructor will entertain any grading related question that is submitted by a student more than a week after the class in which the graded exams are first returned to the students. If any student submits a grading related question within the one week time limit and is not satisfied with the TA's response, the instructor should be contacted as soon as possible, but no later than a week after obtaining a response from the TA. There will be approximately 5 Homework assignments.

Attendance Policy

Although attendance will not be taken, students are expected to attend all classes. **Unless there is an emergency situation, walking out of a class-room during a lecture is rude, disrespectful and is considered disruptive behavior. Students who choose to leave the class-room during a lecture will not be readmitted for that lecture. If a student chooses to leave the class-room before the end of a lecture on two or more occasions during a semester, s/he will be referred to the University Judicial System for disciplinary action. Students who are ten or more minutes late will not be admitted to the class-room.** Students are responsible for all the homeworks, assignments and other materials discussed or distributed in class, whether or not they are present.

Trust and Collaboration

A note about our relationship throughout this semester and beyond. First, it is built on trust. You must trust that I have put serious thought into course content, structure and presentation of lectures, notes, homeworks and exams. In turn, I trust that the Homeworks and Exams which you submit are your own and that they are done individually. Various forms of academic dishonesty or "cheating" are listed and explicitly defined in the *Rensselaer Handbook*. For example, receiving help during an examination or copying homework solutions from another student and submitting it as your own is not allowed. The *Student Handbook* lists procedures for responding to cheating and states that "Cheating in any form violates trust between students and teachers and seriously undermines the educational process and penalties for plagiarism or any form of cheating is quite harsh at this University." Students are strongly urged to familiarize themselves with the cheating portion of the *Student Handbook*.

While collaboration on Projects between team members is allowed, Homeworks and Exams must be done individually. Two or more project teams cannot share their work in any form. Written report for the project must include a list of authors of the report on the front page, signifying that the report is entirely written by the authors. Please note that it is neither ethical nor legal to copy sentence(s) or paragraphs from other sources, **even if you cite the source**. It is perfectly ethical and legal to express others' ideas in your own words, but you cannot reproduce others' expression of ideas and submit it as your own.

Tentative schedule

Day	Date	Chapter(s)	Topic(s)
Tue	8/26	1.1	Introduction to Facilities Design
Thu	8/28	1.2-1.3	Introduction to Facilities Design
Tue	9/2	7.1-7.3	Models for the Layout Problem
Thu	9/4	7.4-7.5	Models for the Layout Problem
Tue	9/9	7.6-7.7	Models for the Layout Problem
Thu	9/11	8.1-8.2	Advanced Algorithms for the Layout Problem
Tue	9/16	8.2	Advanced Algorithms for the Layout Problem
Thu	9/18	8.2-8.3	Advanced Algorithms for the Layout Problem
Tue	9/23	8.3-8.4	Advanced Algorithms for the Layout Problem
Thu	9/25	8.5-8.6	Advanced Algorithms for the Layout Problem
Tue	9/30	A.1-A.2	Introduction to Queuing, Queuing Network and Simulation Modeling
Thu	10/2	A.3-A.4	Introduction to Queuing, Queuing Network and Simulation Modeling
Tue	10/7	A.4	Introduction to Queuing, Queuing Network and Simulation Modeling
Thu	10/9	9.1-9.2	Material Handling
Tue	10/14	-	No classes
Thu	10/16	9.3-9.6	Material Handling
Tue	10/21	9.7-9.8	Material Handling
Thu	10/23	10.1-10.6	Storage and Warehousing
Tue	10/28	-	Exam 1
Thu	10/30	10.7	Storage and Warehousing
Tue	11/4	10.7-10.8	Storage and Warehousing
Thu	11/6	10.8-10.9	Storage and Warehousing
Tue	11/11	11.1-11.3	Basic Models for the Location Problem
Thu	11/13	11.3-11.4	Basic Models for the Location Problem
Tue	11/18	11.4-11.5	Basic Models for the Location Problem
Thu	11/20	12.1-12.2	Advanced Location and Routing Models
Tue	11/25	12.2-12.3	Advanced Location and Routing Models
Thu	11/27	-	No class – Thanksgiving Break
Tue	12/2	12.3	Advanced Location and Routing Models
Thu	12/4	12.4	Advanced Location and Routing Models
Tue	12/9	12.4-12.5	Advanced Location and Routing Models
Sat	12/13	-	Exam #2 (4:45 pm – 7:15 pm)