

# IE 327-Facilities Design

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**Textbook (required):** Facilities Planning, 3rd Edition by James A. Tompkins, John A. White, Yavuz A. Bozer, J. M., A. Tanchoco, John Wiley & Sons, 2003.

**Supplementary Reference:** Facilities Design by Sunderesh S. Heragu, 1997.

## **Description:**

This is an introductory course on facilities planning with emphasis on the design, analysis, and selection of manufacturing facilities and material handling systems. The topics covered include definition of facilities planning, role of product process and schedule design, flow, space, and activity relationship, personnel, capacity and space requirements planning, computer-aided layout planning, material handling systems and equipment, storage and warehousing, mathematical approaches to location problems, and performance evaluation and selection among alternatives.

**Objective of the course:** At the conclusion of this course, you should be able to

- Specify primary and related activities in a facility.
- Determine interrelationships among the activities.
- Determine the space requirements.
- Design, select and analyze various computer-aided layout planning methods.
- Develop and evaluate layout plans for a facility.
- Determine material handling equipment requirements.
- Develop facility location plans.
- Integrate and analyze all the components of facilities design.
- Evaluate, implement and maintain facility plans.

## **Policies and Procedures:**

- **UBlearns:** Lecture notes and course materials will be posted at course's UBlearns homepage. You can access the site using your UB userid and password at:

<https://ublearns.buffalo.edu/>

- **Exams:** There will be two 50-minute progress exams during the semester and a comprehensive final exam.

- **Missed Exams:** No excuses for missed exams will be accepted other than certified medical excuses or prior instructor’s approval.
- **Homework:** Completed assignments should be turned in at the beginning of the class in which they are due. Penalty for late homework/assignments will be 10% per late day and up to a maximum of 50%. No assignments will be accepted after the graded ones are returned to the students.
- **Project:** There will be a semester project during the semester. Groups of three or four will be formed to work on the project.
- **Posted solutions:** The solutions for the assignments will not be posted. It is your responsibility to make sure to solve the problems by getting help before they are due and/or after they have been handed in.
- **Individual effort:** Unless otherwise instructed, each student must work on his/her assignment individually. However, you are allowed to discuss (not copy) the assignments with your classmates. Any academic dishonesty (i.e. cheating, plagiarism...) shall be resolved according to the University’s **Academic Integrity Policy**. Please check the following page for more information:  
<http://www.ub-judiciary.buffalo.edu/art3a.shtml##integrity>
- **Team effort:** Teams will periodically be asked to submit individual effort assessment with completed assignments. These assessments will be incorporated into assignment grades. Teams having problem working together should make every effort to resolve them by themselves. If that doesn’t work, see the instructor for a help.
- **Course grade:** A weighed-average grade will be calculated and letter grades will be assigned to the overall grades as shown below.
- **Attendance:** Formal roll may be held on an occasional basis. If your final grade is in a “gray area”, your attendance and performance in the class might increase your final grade one letter higher. For instance, two people getting the same overall grade (say, 89) might therefore get different letter grades (A- and B+) based on their participation in the class.

**Grade Distribution for the course is as follows:**

Homework Assignments.....	15%
Project.....	20%
Exam 1.....	20%
Exam 2.....	20%
Final Exam .....	25%
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Total.....	100 %

Grade Range	Letter Grade
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$93.33 \leq \text{Average} < 100$	A
$90 \leq \text{Average} < 93.33$	A-
$86.67 \leq \text{Average} < 90$	B+
$83.33 \leq \text{Average} < 86.67$	B
$80 \leq \text{Average} < 83.33$	B-
$76.67 \leq \text{Average} < 80$	C+
$73.33 \leq \text{Average} < 76.67$	C
$70 \leq \text{Average} < 73.33$	C-
$66.67 \leq \text{Average} < 70$	D+
$60 \leq \text{Average} < 66.67$	D
Average < 60	F

### Tentative Schedule

Week	Topic	Reading
1	Syllabus, Introduction	Chp. 1,2
	Definition of facilities planning	Chp. 1,2
	Product, process and schedule design	Chp. 3
2	Martin Luther King Day, No Class !!!	
	Schedule design	Chp. 3
	Flow planning	Chp. 3
3	Flow analysis	Chp.3
	Flow and space planning	Chp. 3
	Layout planning	Chp. 6
4	Layout planning, pairwise exchange	Chp. 6
	Graph-based layout planning	Chp. 6
	CRAFT	Chp. 6
5	Blocplan	Chp. 6
	LOGIC and MULTIPLE layout planning	Chp. 6
	Layout planning/Review for Exam I	Chp. 6
	Mixed integer programming in layout planning	Chp. 6
6	Material handling	Chp. 5
	Material handling	Chp. 5

	Material handling	Chp. 5
7	Material handling	Chp. 5
	Material handling	Chp. 5
	Material handling cost estimation	Chp. 5
8	Material handling equipment	Chp. 7
	Storage and warehousing	Chp. 7
	Storage and warehousing	Chp. 7,10
11	Storage and warehousing	Chp. 7,10
	Storage and warehousing	Chp. 7,10
	Storage and warehousing/ Review for Exam II	Chp. 7,10
12	Analysis and design of integrated facilities	
	Analysis and design of integrated facilities	
13	Analysis and design of integrated facilities	
	Evaluating and selecting the facilities plan	Chp. 11
	Evaluating and selecting the facilities plan	Chp. 11
14	Evaluating and selecting the facilities plan	Chp. 11
	Preparing, presenting, implementing, and maintaining the facilities plan	Chp. 12
	Preparing, presenting, implementing, and maintaining the facilities plan	Chp. 12
15	Preparing, presenting, implementing, and maintaining the facilities plan/ Review for Final Exam	Chp. 12
	Project presentations	
	Project presentations	
16	Project presentations	