IE 1055 - Facility Layout and Material Handling
Syllabus
Spring Term 2018 - 2019

Instructor: Prof. Robert T. P. Lu
Credit Hours: 3
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Office Hours: Tuesdays and Wednesdays, 16:30 PM - 18:00 PM
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Teaching Assistant:
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Lectures: Thursdays, 09:00 AM - 11:55 AM
Classroom: 4-201

Textbook Facilities Planning (Fourth Edition), by Tompkins, White, Bozer, and Tanchoco, Publ. John Wiley and Sons.

Course Objective

This course is to study the design, planning, selection, implementation, and management of production facilities and material handling systems, including location, flow, layout, space, and operation. Emphasis will be on production systems, automation, material handling systems, storage and warehousing, and cost and quality. The overall objective is to learn how to conduct a new facility design or redesign of an existing facility together with the material handling systems.

Course Outline

This course provides an introduction to facility layout, location, and material handling systems. The course topics tentatively include: an overview of why facility layout and material handling systems are important and its relationship with supply chain, activity relationships analysis, manufacturing flow pattern design, space and personnel requirements, construction and improvement layout planning algorithms, systematic layout planning techniques, manual and computerized layout techniques, facility location, introduction to material handling equipments, material handling system design, and warehouse operations. Topics may vary depending upon the actual student composition and time constraints.

Applicable ABET Outcomes for this course:

(a) An ability to apply knowledge of mathematics, science, and engineering

(c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(e) An ability to identify, formulate, and solve engineering problems
(g) An ability to communicate effectively
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Pre-requisites No specific courses but students must show sufficient academic maturity

Co-requisites None

Grading

Mid-term Exam	20%
Final Exam	20%
Homework	20%
Project	20%
Class participation – (Think and Discuss)	20%

Final grades:

Level	Letter Grade	Reported Numerical Score	Grade Points
Superior Performance	A	90 - 100	4.0
	A-	85 - 89	3.7
Meritorious Performance	B+	80 - 84	3.3
	B	76 - 79	3.0
	B-	73 - 75	2.7
Adequate Performance	C+	70 - 72	2.3
	C	66 - 69	2.0
	C-	63 - 65	1.7
Minimal Performance	D+	61 - 62	1.3
	D	60	1.0
Insufficient Performance (Failure)	F	< 60	0.0

Course Policies:

- Students are expected to come prepared for each lecture by reading the appropriate material prior to class

- Questions concerning the grading of homework assignments, project-related materials, or exams must be presented to the instructor or the TA within one week (7 calendar days) after the materials have been made available for return to the student
- Late assignments will NOT be accepted and all assignments, projects, examinations, etc. must be completed/taken at the scheduled time. No exceptions will be made unless there are truly extenuating circumstances
- Cheating or academic dishonesty in any form will result in a grade of F for the course; there will be no exceptions to this policy.
- Professional classroom demeanor is required; in particular, all cell phones and personal electronic devices must remain off or silent during lecture.
- Do not conduct side conversations during the lecture as it is distracting to the lecturer and other students.

Email Policy I will respond to emails as promptly as I can, usually within 2 days. For detailed technical questions, please come to TA or me during office hour. I will not be addressing detailed technical questions via email as it is not efficient.

Project

The semester project will be by phase. Detail description of the project and project phase will be provided during class. The project will be team-based, applying facility layout and material handling system design techniques to solve a real-world problem. Evaluation of the project will be based on both the presentation and the written report. In the team-based project report, you will need to identify which part of the report you were responsible for. The overall performance of the team report and presentation will account for 50% of your grade and your personal performance of the report and presentation will account for the other 50%. That means, while the project will be team-based, the evaluation will be individual-based.

Reference Material

www.mmh.com – *Modern Materials Handling*
www.idsystems.com – *ID Systems*
www.mhpn.com – *Material Handling Product News*
www.mhi.org - Material Handling Industry (a trade association)
www.cicmhe.org – College Industry Council for Material Handling Education (educational group within the Material Handling Industry of America)
www.dcvelocity.com – *DC Velocity*. Discusses equipment and best practices for warehouse and distribution center operation

http://www.apics.org/ – APICS is the association for supply chain management

Audio-Video Recording Statement

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance should be used solely for the student's own private use.

Special Accommodations

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact the instructor.

Tentative Schedule

Week 1: Introduction and overview of strategic facilities planning
Week 2: Product, process, and schedule design
Week 3: Scrap and rework calculations
Week 4: Machine fractions
Week 5: Planning departments, product, process, cells
Week 6: Activity relationships
Week 7: Flow patterns and measuring flow
Week 8: Space allocations, aisles, and personnel requirements
Week 9: Mid-term Exam
Week 10: Material handling equipment and systems I
Week 11: Layout types
Week 12: Systematic Layout Planning
Week 13: General algorithmic layout approaches
Week 14: Computerized layout packages
Week 15: Warehousing and material handling system design
Week 16: Location Problems
Week 17: Final Exam and Final Project Presentation

Exam Schedule

TBA