



**DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING  
MECHANICAL ENGINEERING PROGRAM, BSC.**

**Course Syllabus**

**1. Course number and name**

IE 565 Industrial Facility Planning

**2. Credits and contact hours**

(3+0) 3 credit hours, 3 contact hours

**3. Course type**

Face to face Learning Course (3+0)

**4. Instructor's or course coordinator's name**

Dr. Hanan Saleet

**5. Textbook information**

James A. Tompkins, John A. White, Yavuz A. Bozer, J. M .A. Tanchoco,  
Facilities Planning, John Wiley & Sons, 2010

**a. Other supplemental materials**

-Heragu, S., Facilities planning, 2018, 4th Edition, by CRC Press

-Total Facility Management 4th Edition, by Brian Atkin , Adrian Brooks, 2015,  
ISBN-13: 978-1118655382, ISBN-10: 1118655389

-Lectures notes

**6. Specific course information**

**a. Catalog description**

Product, process and schedule design. Space, flow and activity planning.  
Layout Planning Modules and Algorithms. Material handling systems  
(MHS), warehousing and Kanban systems.

**b. Prerequisites or co-requisites**

**co-requisites:** IE 323 Economy & Eng. Management

**c. The course is:**

Required in Industrial Engineering program.

**7. Specific goals for the course**

**a. Course outcomes:**

After completion of the course, students are expected to be able to:

CO-(1): Identify the effect of product, process, and schedule design on facility design



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- CO-(2): Design buffer systems in automated production lines  
CO-(3): Design and assess material handling systems and unit loads  
CO-(4): Demonstrate and determine warehouse operations, layouts, and space requirement

**b. The following student outcomes are addressed by the course:**

- SO-(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  
SO-(d) an ability to function on multidisciplinary teams  
SO-(g) an ability to communicate effectively.  
SO-(pc-3) ability to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy using appropriate analytical, computational, and experimental practices.

**8. Learning Outcomes and their Alignment with Program Educational Objective (PEO's), Methods of Delivery, and Assessment Methods:**

Learning Outcomes	Program PEOs	Method of Delivery	Assessment Method
<b>Course Outcomes</b>			
CO-(1): Identify the effect of product, process, and schedule design on facility design	-	Lectures (Example and Problems)	Exams
CO-(2): Design buffer systems in automated production lines	-	Lectures (Example and Problems)	Assignment
CO-(3): Design and assess material handling systems and unit loads	-	Lectures (Example and Problems)	Project
CO-(4): Demonstrate and determine warehouse operations, layouts, and space requirement	-	Lectures (Example and Problems)	Exams
<b>Student Outcomes</b>			
SO-(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social,	-	Lectures (Example and Problems)	Midterm Exam



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political, ethical, health and safety, manufacturability, and sustainability			
SO-(d) an ability to function on multidisciplinary teams	2	Lectures (Example and Problems)	Midterm Exam
SO-(g) an ability to communicate effectively.		Term Project	Term Project-Part 1
SO-(pc-3) ability to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy using appropriate analytical, computational, and experimental practices	1	Term Project	Term Project-Part 1

**9. Weekly Teaching Plan**

Week	Lecture	Topic	Method of Delivery
1	Lec_1	1.1 Facilities Planning Defined 3	Lecture
	Lec_2	1.2 Significance of Facilities Planning 9	Lecture
	Lec_3	1.3 Objectives of Facilities Planning 12	Lecture
2	Lec_4	1.4 Facilities Planning Process 13	Lecture
	Lec_5	1.5 Strategic Facilities Planning 18	Lecture
	Lec_6	1.6 Developing Facilities Planning Strategies 21	Lecture
3	Lec_7	<b>Chapter Two PRODUCT, PROCESS, AND SCHEDULE DESIGN 2.1 Introduction 30</b>	Lecture
	Lec_8	2.2 Product Design 32	Lecture
	Lec_9	2.3 Process Design 36	Lecture
4	Lec_10	2.4 Schedule Design 47	Lecture
	Lec_11	2.5 Facilities Design 63	Lecture
	Lec_12	<b>Chapter Three FLOW SYSTEMS, ACTIVITY RELATIONSHIPS, AND SPACE REQUIREMENTS 3.1 Introduction 83</b>	Lecture
5	Lec_13	3.2 Flow Systems 84	Lecture



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	Lec_14	3.3 Material Flow System 88	Lecture
	Lec_15	3.4 Departmental Planning 97	Lecture
6	Lec_16	3.5 Activity Relationships 113	Lecture
	Lec_17	3.6 Space Requirements 119	Lecture
	Lec_18	Problems 131	Lecture
7	Lec_19	<b>Chapter Five MATERIAL HANDLING 5.1 Introduction 175</b>	Lecture
	Lec_20	5.2 Scope and Definitions of Material Handling 176	Lecture
	Lec_21	5.3 Material Handling Principles 179	Lecture
8	Lec_22	5.4 Designing Material Handling Systems 181	Lecture
	Lec_23	5.5 Unit Load Design 186	Lecture
	Lec_24	5.6 Material Handling Equipment 204	Lecture
9	Lec_25	5.7 Estimating Material Handling Costs 209	Lecture
	Lec_26	5.8 Safety Considerations 210	Lecture
	Lec_27	Problems 213	Lecture
10	Lec_28	Appendix 5B Material Handling Equipment 215	Lecture
	Lec_29	<b>Chapter Six LAYOUT PLANNING MODELS AND DESIGN ALGORITHMS : 6.1 Introduction 292</b>	Lecture
	Lec_30	6.2 Basic Layout Types 294	Lecture
11	Lec_31	6.3 Layout Procedures 296	Lecture
	Lec_32	6.4 Algorithmic Approaches 302	Lecture
	Lec_33	6.10 Developing Layout Alternatives 362	Lecture
12	Lec_34	<b>Chapter Seven WAREHOUSE OPERATIONS : 7.1 Introduction 385</b>	Lecture
	Lec_35	7.2 Missions of a Warehouse 387	Lecture
	Lec_36	7.3 Functions in the Warehouse 389	Lecture
13	Lec_37	7.4 Receiving and Shipping Operations 391	Lecture
	Lec_38	7.5 Dock Locations 414	Lecture
	Lec_39	7.6 Storage Operations 415	Lecture
14	Lec_40	Problems 444	Lecture
	Lec_41	P	Lecture
	Lec_42	Determining Cycle Time:Largest Candidate Rule	Lecture
15	Lec_43	Automated production lines Storage Buffers	Lecture
	Lec_44	Analysis of two stage line: Buffer effectiveness h(b)	Lecture
	Lec_45	Process layout	Lecture



# FET

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FACULTY OF ENGINEERING & TECHNOLOGY



Engineering  
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### 10. Grade Distribution:

Assessment	Grade	Week No.
- First Exam	20%	
-Second Exam	15%	
-Assignments (Reports /Quizzes/ Seminar / Tutorials/ Home works ....)	15%	1-16 <sup>th</sup> Week
- Final Examination	50%	16 <sup>th</sup> Week

Note: Make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.