

IE 304 Production and Service Systems Planning and Design

Fall 2022-2023

Instructor	Lecture	Classroom	Day/Time	Office Hours	Room
Bülent Çatay	Lec1	UC G030	M 15:40–17:30	T 13:40–14:30	FENS 1058
	Lec2	UC G030	T 15:40–16:30	or by appointment	

TA	Recitation	Classroom	Day/Time	Office Hours	Room
Hazal Bulutcu	A1	FENS L058	T 17:40–18:30	W 11:40–12:30	FENS L068
Raci Berk İslim	A2	FENS L061	T 17:40–18:30	R 11:40–12:30	FENS L068
Raci Berk İslim	B1	FENS L030	T 18:40–19:30		
Doğukan Zorlu				M 10:40–11:30	FENS L068

Objectives:

This course is intended to introduce the students to the design and operation of manufacturing and service facilities. We will present a conceptual description and classification of modern production environments and address major issues faced during the planning and control of their operation. We will focus on the decomposition of the overall production planning and control problem to a number of subproblems, and the development of quantitative techniques and analytical tools for addressing the arising subproblems. The topics include (but are not limited to) assembly lines, sequencing and scheduling, flexible manufacturing systems, group technology and cellular manufacturing, and facilities planning and design.

Although the focus is on manufacturing systems, emphasis will be given to introduce the application of methodologies covered for manufacturing systems to service systems as well. The students are expected to have a solid background operations research.

Learning Outcomes:

- Studying different production systems and assembly line balancing via modeling and heuristics
- Designing manufacturing cells by applying group technology
- Modeling and solving machine scheduling problems
- Modeling and solving facility layout and location problems

Recommended Textbooks:

Modeling and Analysis of Manufacturing Systems. R.G. Askin and C.R. Standridge, John Wiley, 1993. [TS155.6 .A75 1993]

Facilities Design, 3rd edition. S. Heragu. CRC Press, 2008. [TS177 .H47 2008]

*** THESE BOOKS ARE ON 1-DAY RESERVE AT THE INFORMATION CENTER ***

Additional References:

Principles of Sequencing and Scheduling. K.R. Baker and D. Trietsch, Wiley, 2009.

Facility Layout and Location: An Analytical Approach. R.L. Francis, L.F. McGinnis, and J.A. White, Prentice Hall, 1992.

Production and Operations Analysis. S. Nahmias, Irwin/McGraw-Hill.

Grading Policy:

$AvgGrade = \frac{1}{3} \text{ Midterm 1} + \frac{1}{3} \text{ Midterm 2} + \frac{1}{3} \text{ Final Exam}$

All grades are out of 100. In order to receive a passing letter grade you are required to get at least an AvgGrade of "40".

There will be two in-class midterm exams and a comprehensive final exam given closed book and closed notes. A single comprehensive make-up exam will be offered following the final exams period to those who have missed one of the midterm exams and have a medical report given or approved by the SU Health Center. If you miss both exams, one of your grades will be "0" regardless of your excuse. There is no make-up for the make-up exam!

Tentative Course Outline:

Week	Topic	Reference
1	Introduction	Askin-Ch1
2-3	Assembly Lines	Askin-Ch2
4-5	Single Machine Scheduling	Askin-Ch4
07.11	Midterm Exam 1	
6-8	Flow Shop and Job Shop Scheduling	Askin-Ch4
9-10	Flexible Manufacturing Systems	Askin-Ch5
11-12	Group Technology and Cellular Manufacturing	Askin-Ch6, Heragu-Ch8
19.12	Midterm Exam 2	
13-14	Facility Layout	Askin-Ch7, Heragu-Ch1-4

Disclaimer:

The instructor reserves the right, when necessary, to alter the grading policy, change exam dates, and modify the syllabus and course content. Modifications will be announced in class and at the SUCourse+. Students are responsible for the announced changes.

Academic Integrity:

Students in this course are expected to honor the academic integrity principles according to the SU rules and procedures. Non-compliance to [academic integrity](#) principles through plagiarism, using or accomplishing another person's work, and/or submitting previously used work will be penalized.