

IE 304 Production and Service Systems Planning and Design Spring 2022-2023

Instructor	Lecture	Link	Day/Time	Office Hours	Room
Bülent Çatay	Lec1	950 2065 7272	T 13:40–14:30	T 15:00–16:00	1058 and
	Lec2	950 2065 7272	F 9:40–11:30	or by appointment	online

TA	Recitation	Link	Day/Time	Office Hours	Room
Doğukan Zorlu	A1	910 5178 6915	F 15:40–16:30	W 9:00–10:00	Online
Aksel Akmercan	A2	928 6645 0115	F 15:40–16:30	R 15:00–16:00	Online
Raci Berk İslim	B1	682 368 2154	F 16:40–17:30	R 12:00–13:00	Online

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, 5th edition. S. Heragu. CRC Press, 2022. [TS177 .H47 2022] (Online e-book, the earlier editions are available in print)

*** 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 = 40% Quizzes + 60% 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 **4 quizzes** which will be given online and during lecture hours (dates will be announced). The final exam is **comprehensive** (i.e. it includes all the topics covered throughout the semester) and will be given **in class** with closed book/notes.

Make-up Policy:

A comprehensive make-up exam will be offered following the final exams period to those who have missed the final exam and have a medical report issued or approved by the SU Health Center. There is no make-up for the make-up exam!

One (1) comprehensive make-up quiz will be offered following the final exams period to those who have missed a quiz (no medical report required). If you miss more than one quiz, your grades for the remaining quizzes will be "0" regardless of your excuse.

Tentative Course Outline:

Week	Topic	Reference
1	Introduction	Askin-Ch1
2-3	Assembly Lines	Askin-Ch2
4-5	Single Machine Scheduling	Askin-Ch4
6-7	Flow Shop Scheduling	Askin-Ch4
7-8	Job Shop Scheduling	Askin-Ch4
9-10	Flexible Manufacturing Systems	Askin-Ch5
11-12	Group Technology and Cellular Manufacturing	Askin-Ch6, Heragu-Ch8
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.