

IE 375 PRODUCTION PLANNING Spring Semester, 2023-2024

Lectures: Tuesday 10:30–12:20, Thursday 15:30–17:20, EE04

Program for each week's lecture hours may vary, and will be announced prior to the week. There is no designated spare-hour for this course.

Instructor: Dr. Nesim K. Erkip, EA320, nesim@bilkent.edu.tr, no office hours – appointments only by e-mail

Course TA: Efekan Şentürk EA325, efekan.senturk@bilkent.edu.tr, office hours: TBA

Text: *Production and Operations Analysis: Strategy, Quality, Analytics, Application*, Seventh Edition, Steven Nahmias and Tava Lennon Olsen, Waveland Press, 2015. (Available at the Reserve Library.) – A **reading list** is available at the course WEB page.

Prerequisite: IE 202 – Introduction to Modeling and Optimization.

Software: Excel, MP Solver and/or any general-purpose programming language (to be used in assignments).

Course Overview

This course is one of the few courses in the department where the students become familiar with one of the main functions of organizations: operations. For IE's, "function" implies a unique context where applying the tools, techniques, and approaches learned in the previous courses is to be implemented for the decision-making instances dictated by the function.

In this course, we first discuss a variety of high-level issues related to production, including operations strategy and its dimensions, several examples of strategic initiatives that were successfully adopted, strategies developed by matching the phases of product and process life cycles and utilizing the learning and experience curves, and push vs. pull philosophies in production planning. This discussion helps in setting the decision-making context.

The material and number of hours planned to be spent is outlined below:

- Introduction and Forecasting (7 hours)
- Inventory Planning, Deterministic and Stochastic Inventory Problems (15 hours)
- Planning Logic and Aggregate Production Planning (APP) (10 hours)
- Machine Scheduling: Introduction, classification, simple problems (6 hours)
- Supply Chains and wrap-up (2 hours)

Conduct of the Course:

The textbook will be followed most of the time. The lecture notes, if any, in addition to the material covered in class, the textbook, and the assignments, will be posted on the course's WEB page throughout the semester. The number of lecture hours may vary weekly, and several recitation sessions will be held in certain weeks. Any critical updates and announcements regarding the lecture, recitation hours, and assignments will be sent to your e-mail account available in STARS throughout the semester.

Course Catalog Description:

The course concentrates on the analysis of production planning systems using mathematical programming and other analytical techniques. Areas investigated will include forecasting; integrated production-inventory systems; inventory and lot-sizing models; machine scheduling, capacity planning, and supply networks. *Credit units: 3, Prerequisite: IE 202.*

Course Objectives:

- Introduce basic conceptualization of planning problems for production systems.
- Teach students fundamental problem areas of “Production Planning” and introduce the relation between planning and control activities, as well as issues related to system design.
- Teach approaches that utilize mathematical modeling and optimization to solve problems and emphasize the importance of solving a planning problem analytically.
- Introduce and emphasize the role of using performance measures.
- Build appreciation of complexity for more detailed and up-to-date “Production Planning” related problems; build appreciation of limitations of analytical approaches.
- Maintain mutual respect and effective interaction between students and instructors/assistants.

Grading:

- Homework Assignments and One Case Study – (Total 10%)
- Exam I - 25% - February 29, 2024 – In class
- Exam II - 30% - April 4, 2024 – In class
- Final Exam - 35% - Date, Time and Location: TBA

Grade FZ

To qualify to take the final exam:

- If all assignments are graded until the due date for submission of FZ grade, you have to collect at least 20 points out of 65 points.
- If some assignments are not graded until the due date for submission of FZ grade, you have to collect at least (20 minus percentage of ungraded assignments) points out of (65 minus percentage of ungraded assignments) points. You have to collect at least 20 points if you do not submit those final assignments.

Assignment Submission Policy: For all the assignments due-dates are fixed; no late assignment will be accepted. Either an assignment submission box will be placed in front of the office EA327 about two days before submission date and will be removed at the time of the deadline, or your submission through the course Moodle page will be enabled. For each of the assignments, the submission method will be announced.

Privacy policy: Grade information and other personal information will not be disclosed publicly. Please do not demand to learn somebody else's grade or other pertinent personal information. Also, phone inquiries are not accepted.

Academic Dishonesty:

Academic misconduct is not tolerated, and violations will be treated following the University policy.

· For individual/group assignments: Discussion of the course material and working in groups are effective ways of learning. For group assignments, communication among the group members is essential and expected for the success of the outcome. However, this does not mean one can copy the assignment from one of the friends. A student/ a group can discuss the homework material with peers but is expected to be alone, without any written solution to look at when the final version of the assignment is prepared. It is crucial to understand the value of this exercise in learning. Any violation of the above understanding will result in measures outlined in the student rules and regulations.

· For exams: The students are expected to act under the following statement they will be asked to sign:

Academic integrity is expected of all students of Bilkent University at all times, whether in the presence or absence of faculty members. Understanding this, I declare that I shall not give, use or receive unauthorized aid in the examination.

Any violation of the above understanding will result in measures outlined in the student rules and regulations.

Make-up policy:

- (1) There is no make-up for the assignments. In some rare cases your grading percentages may be modified by the course instructor.
- (2) For exams, if you have a legitimate health reason:
 - a. To satisfy university requirements, you should follow the administrative path and submit your health report officially.
 - b. You should contact the instructor before or at the date of expiration of your health report (latest the next day or before by e-mail). If you do not contact, you may lose your right to get a make-up. The make-up exam can be at any time (oral or written) after the expiration date of the health report.

Solutions to exams, homework and claims for grade change:

- (1) No solutions will be distributed for the exams or assignments. However, a detailed "Comments" document will be prepared for each homework and exam. This document will be on the questions asked and will discuss several related issues, including how grading was performed, as well as the sketch of the solution and possible extensions. It will also contain information on the performance of the class, shared successes, common mistakes, etc.
- (2) For any of the assessment activities, you are expected to pick up your assignment (except the exams). If a student has concerns about how the work has been graded, please write the claim and ask for re-grading. The outcome will be mailed directly to the e-mail account of the person who objected. Note that the teaching assistant's office hours should be used to pick up the assignments or check exams. In some cases, additional hours may be announced, and the students are expected to come within those hours. If a student can not make those hours, he/she can write an e-mail to the teaching assistant asking for an appointment.