TED University
Department of Industrial Engineering
IE 311 – Manufacturing and Service Operations Planning I
Fall 2023

Course Description

Introduction to production and service planning. Design of production planning systems using analytical techniques. Forecasting. Inventory control and management.

Credits

(3+0+0) 3 TEDU Credits, 6.0 ECTS Credits

Pre-requisites:

IE 232

Course Objectives

The goal of this course is to teach mathematical and other analytical techniques for hierarchical planning of the operations of a production system. Major topics corresponding to the activities performed in different phases of the planning process are demand forecasting, aggregate planning, lot sizing, inventory control, materials requirements planning and scheduling.

Learning Outcomes

Upon successful completion of this course, a student will be able to
Employ the hierarchical production planning approach (B3)
2. Utilize past data to accurately predict future demands by using fundamental forecasting methods. (B3)
3. Formulate aggregate planning problems as mathematical programs. (B5)
4. Apply basic lot sizing methods to determine order/production frequency and quantities. (B3)
5. Perform materials requirement planning on small problems. (B3)
6. Use the appropriate dispatching and scheduling rules in basic single machine, parallel machine and flowshop problems arising in operational scheduling. (B3)

Instructor:

Dr. Mehmet R. Taner
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Office: A320 & Graduate School
Phone: 585 0024
Office Hours: Mon 16:00-16:50

Required Text Book:

Nahmias, S. (2013), Production and Operations Analysis (6th ed.), McGraw-Hill/Irwin

Supplementary Text Books:

1. Hopp, W. J., Spearman, M. L. (2008), Factory Physics (3rd ed.), McGraw-Hill/Irwin
2. Simchi-Levi, D., Kaminsky, P., and Simchi-Levi, E. (2007), Designing and Managing the Supply Chain (3rd ed.), McGraw-Hill/Irwin.
3. F.R. Jacobs, W. Berry, D.C. Whybark and T. Wollman (2011), Manufacturing Planning and Control for Supply Chain Management, McGraw-Hill/Irwin.

Course Schedule:

Mon 13:00 – 14:50 (G005)
Tue 13:00 – 13:50 (G005)

Course Management System:

TEDU LMS (https://lms.tedu.edu.tr/). All announcements and course related materials will be posted on the TEDU LMS course page.

Planned Learning Activities and Teaching Methods

Telling / Explaining
Discussion/Debate
Questioning
Reading
Problem Solving
Inquiry
Collaborative Learning
Case Study / Scenario Analysis

Grading:

Active Learning Exercise:	3 %
Attendance and Participation	3%
Coursera Independent Project	5%
Homework:	15 %
Case/Scenario Analysis:	9 %
Exam I:	20%
Exam II:	20%
Final Exam:	25%

Coursera Independent Study

You will be expected to complete a selected Coursera Independent Study on application of forecasting methods in R programming language. Those of you who are unfamiliar with R basics, there will be a second Coursera Independent Project to familiarize you with R. Only the forecasting project is going to count toward your grade. The Coursera grade will be determined based on the Coursera reports accounting for the grade received and your completion percentage.

Active Learning Exercises and Quizzes

Throughout the semester you will have a number of (unannounced) active learning exercises in-class. These exercises will help you learn the course material in an active and collaborative manner. All attendees contributing to the collaborative learning environment will receive at least one point; and the students who complete their work satisfactorily will receive an additional point.

Attendance

Attendance and participation are required in this course. Attendance will be taken via Moodle at the **beginning** of each class. If you arrive late you will not be able to record your attendance for that session.

Estimated Student Workload

Lectures	42 hrs
Readings	30 hrs
Homework (including Coursera)	30 hrs
Exam I	15 hrs
Exam II	15 hrs
Final Exam	15 hrs
Case Study:	10 hrs

Total estimated workload is 157 hours.

Important Dates

Exam 1: November 1 (evening)
Exam 2: December 12 (evening)
Case Study: due by 11:59 pm on January 6

Course Evaluation

Course feedback survey will be conducted in the last two weeks of the semester.

Make-up Policy

In order to be eligible to take a make-up for the term exams, you should report your excuse formal (e.g., a medical report) to the course instructor and receive a written (e.g. via e-mail) permission no later than one week after the exam date. A single make-up exam will be given at or after the end of the semester. No make-ups will be given for active learning exercises, the coursera project, the case study or homework.

Misconduct in class and exams

All cell phones must be brought to silent mode in class. Turn off your cell phone and put it out of sight during the tests, if the proctor even sees your cell phone during a test, it will be considered as cheating, which will lead to punitive action as such.

"All of the following are considered plagiarism: turning in someone else's work as your own, copying words or ideas from someone else without giving credit, failing to put a quotation in quotation marks, giving incorrect information about the source of a quotation, changing words but copying the sentence structure of a source without giving credit, copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not" (www.plagiarism.org)
Plagiarism is a very serious offense and will be penalized accordingly by the university disciplinary committee. The best way to avoid accidentally plagiarizing is to work on your own before you ask for the help of other resources.

Cheating has a very broad description which can be summarized as "acting dishonestly". Some of the things that can be considered as cheating are the following: copying answers on exams, quizzes and assignments, using prohibited material on exams, lying to gain any type of advantage in class, providing false, modified or forged data in a report, plagiarizing, modifying graded material to be re-graded, causing harm to colleagues by distributing false information about an exam, homework or lab. Cheating is a very serious offense and will be penalized accordingly by the university disciplinary committee.

Tentative Course Outline

A tentative course outline is given below. Any changes and updates will be announced on the course web page.

Week	Topic	Readings
1	Production Strategies	Chapter 1
2	Forecasting Methods	Chapter 2 (2.1-2.7)
3	Forecasting Methods (cont'd)	Chapter 2 (2.8-2.9)
4	Aggregate Planning	Chapter 3 (3.1-3.5)
5	Aggregate Planning (cont'd)	Chapter 3 (3.6-3.8)
6	Aggregate Planning (cont'd)	Chapter 3 (3.10-3.12)
7	The EOQ Model	Chapter 4 (4.1-4.5)
8	EPQ and Quantity Discounts	Chapter 4 (4.5-4.7)
9	The Explosion Calculus, Alternative Lot Sizing Techniques	Chapter 7 (7.1-7.2)
10	Alternative Lot Sizing Techniques (cont'd)	Chapter 7 (7.3)
11	MRP	Chapter 7 (7.5)
12	MRP (cont'd), Introduction to Sequencing and Scheduling	Chapter 8 (8.1-8.5)
13	Sequencing on a Single Machine	Chapter 8 (8.6)
14	Sequencing on Multiple Machines	Chapter 8 (8.7)