

# IE 401

## Production and Service Systems Operations

### Course Syllabus Spring 2023-2024

Version 1, updated February 13<sup>th</sup>, 2024

#### Instructor

Dr. Murat Kaya FENS G020, (216) 483 9622, [mkaya@sabanciuniv.edu](mailto:mkaya@sabanciuniv.edu)

Office Hours: Tuesdays 15:40-16:30

#### TAs, LAs and Recitation Sections

##### Teaching Assistants

Burak Ispartali, [burak.ispartali@](mailto:burak.ispartali@)

Deniz Tuncer, [deniz.tuncer@](mailto:deniz.tuncer@)

##### Learning Assistants and Recitation Sections

Recitation Section	Time	Learning Assistant	email
A1	Fridays 17:40-18:30	Kemal Emre Özkaya	<a href="mailto:eozkaya@">eozkaya@</a>
B1	Fridays 12:40-13:30	Hande Pamuksuz	<a href="mailto:pamuksuz@">pamuksuz@</a>
B2	Fridays 12:40-13:30	Zeynep Büşra Banaz	<a href="mailto:bbanaz@">bbanaz@</a>
		Emir Tiryaki	<a href="mailto:emirtiryaki@">emirtiryaki@</a>

#### Learning Outcomes

On completion of the course, students should be able to

- Describe the major steps in the manufacturing planning and control (MPC) hierarchy (including APP, MPS and MRP), and their relationships.
- Develop demand forecasting models using time series methods.
- Apply the fundamental inventory management models (including the EOQ, newsvendor, (Q,R) and (s,S) models) to relevant problems.
- Relate industrial engineering and operations research methods obtained in previous courses to production planning and control domain.
- Formulate and solve production planning problems.

#### Textbooks

- 1) One of the following two versions of the same book:
  - Nahmias S. and Lennon Olsen, T., Production and Operations Analytics, 7<sup>th</sup> or 8<sup>th</sup> edition, Waveland Press.
  - Nahmias, S., Production and Operations Analysis, 5<sup>th</sup> or 6<sup>th</sup> edition, McGraw-Hill.
- 2) For some topics: Vollmann, T. E., Berry, W. L., Whybark, D. C., Jacobs, F. R., Manufacturing Planning and Control for Supply Chain Management, 5<sup>th</sup> or 6<sup>th</sup> edition, McGraw-Hill.

### Useful References

- Silver, E. A., Pyke, D. F., Peterson, R., Inventory Management and Production Planning and Scheduling, 3rd edition, Wiley, 1998.
- Hopp, W. J., M. L. Spearman, Factory Physics, McGraw-Hill. 3<sup>rd</sup> edition. 2011.
- Ptak, C. A., C. J. Smith. Orlicky's Material Requirements Planning. 3<sup>rd</sup> edition. 2011.

### Grading

Quizzes	15%
Top Hat Responses	15%
Midterm Exam -1	20%
Midterm Exam -2	20%
Final Exam (comprehensive)	30%

- For each student, the lowest graded quiz will be dropped from consideration. No other make-up opportunity exists for quizzes.
- Grading-related objections should be discussed with the TAs before bringing the issue to the instructor.
- The letter grade achieved in this course will be determined according to the weights outlined above; not according to what letter grade the student might need.
- The instructor does not discuss letter-grading-related issues with students; hence, students shall not even bother to ask, especially at the end of the semester.
- Students are not given any extra opportunity (such as an extra project etc.) to increase their letter grade as this would be unfair to others.

### Top Hat Software

- During lectures, the instructor will ask quick questions (true/false, multiple choice etc.) using the Top Hat software. Students will need to respond to these quickly.
- Students shall familiarize themselves with the Top Hat software ([www.tophat.com](http://www.tophat.com)) if they have not used it previously. Top Hat app should be installed on student smartphones/ tablets or it can be accessed via a laptop web browser.
- The join code required to enroll in IE 401 Top Hat page is **508279**.
- Students need to register to Top Hat using their SU email address, true name & surname with Turkish characters (if any), and their five-digit student ID number (in the student ID field).
- The lowest 10% of the Top Hat scores for each student will be dropped from consideration. No other make-up opportunity exists for Top Hat questions.

### Course Policies

- Students must follow the recitation section to which they are enrolled.
- All exams will be held in class (that is, not online) and will be closed-notes.
- Attendance records will be taken in most lectures. These have no direct course grade value. Attendance is NOT mandatory but is highly recommended.
- Partial (not complete) lecture slide sets will be posted to SUCourse+.
- Students cannot share any course-related material (documents, recordings etc.) with third parties.

- The instructor may have to make modifications in the syllabus due to unforeseen reasons. Students are responsible for such modifications that will be announced in lectures and/or in SUCourse+.

**Make-up Exam Policy**

- There will be a single make-up exam to replace any one of the midterm exams or the final exam.
- The make-up exam will be conducted after the final exam.
- A student who wants to enter a make-up exam needs to document the reason for missing the exam (such as sickness or an official appointment) and inform the instructor immediately before/after missing the exam.
- The make-up exam will be comprehensive (includes all topics)
- The make-up exam cannot be taken to replace an already-taken exam.

**Course Subjects**

	Nahmias	VBWJ (6 <sup>th</sup> edition)
Production & Operations Management Overview	1	
Forecasting	2	
Inventory Control Subject to Known Demand	4	
Inventory Control Subject to Uncertain Demand	5	
Sales and Operations Planning (S&OP)	3	
Master Production Scheduling (MPS)		5
Material Requirements Planning (MRP)		6
Lot Sizing		6a (related)
Just-in-Time (JIT) Approach		
Further Topics		7
Supply Chain Management		