

IE 400: Principles of Engineering Management – Spring 2022

IMPORTANT: Due to the ongoing pandemic, any change in the university policies about conducting classes and examinations will result in an update on the topics covered and grading assessments, including their percentages. All effort will be made to make these changes as smooth as possible.

- **Instructors:**

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- **Course Web Page:** <https://courses.ie.bilkent.edu.tr/ie400/>

- **Teaching Assistants:**

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- **Undergraduate Tutors:**

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- **Office hours:** By appointment.

- **Prerequisites:** MATH 220 or MATH 223 or MATH 225 or MATH 241. Students will be expected to be comfortable with mathematics.

- **Recommended Textbooks:** We will not have a formal textbook in this course. Most of the material covered in this course (and much more!) is available in *Operations Research: Applications and Algorithms* by Wayne L. Winston, 4th edition, Thomson Brooks/Cole, 2004. The library has several copies (including earlier versions). For topics in engineering economy: *Contemporary Engineering Economics* by C. S. Park, 5th Ed., Prentice Hall, 2010 is a good reference.

- **Course Objectives:** This course is designed to develop an understanding of management decision making situations faced by engineers in designing, constructing, and operating engineering systems. The objective is to enable students to acquire knowledge and skills on methods and techniques developed for handling and solving problems encountered in such situations. The project assignment will help students gain hands-on experience with software to model and solve several classes of optimization problems.

- **Study Sets:** Study sets will be assigned. Though they will not be collected or graded, it is strongly recommended that you work on these problems on your own since they will serve as an excellent educational tool and preparation for the exams.

- **Quizzes:** There will be a total of 4 scheduled quizzes during evening hours. The exact dates and places will be announced during the semester. There is no make-up of the quizzes! The lowest of these four grades will be dropped.

- **Project:** The project assignment (due sometime towards the end of the semester) will be a group project involving **at most 3** students from Sections 1 and 2 combined. Please form your project groups as soon as possible and e-mail the names of your group members to Büşra, by 23:59 on Sunday, February 13, 2022. Students who do not belong to any group by the deadline will solely be responsible from the project. The details of the project will be subsequently announced during the semester. We will mainly rely on LP/ MIP solvers such as CPLEX, Xpress, Gurobi to solve linear and integer programming problems formulated. A brief tutorial will be conducted on how to use the software (Specifically on Python/CPLEX and Python/Gurobi interaction) but you will be on your own in learning the details.

All the group members are responsible from every step of the project. You will be called in for an oral exam to present the knowledge on the project.

- **Exams:** There will be one in-class midterm and an in-class comprehensive final exam some time during the final exam period. The exact dates will be announced during the semester.
- **Make-up Policy:** A make-up examination will only be given under highly unusual circumstances (such as serious health or family problems). The student should contact the instructor as early as possible and provide the instructor with proper documentation (such as a medical note certified by Bilkent University's Health Center).
The **comprehensive** make-up exam will be given before the final exam period.
- **Grading Policy:** Your overall score will be computed based on 15% project, 30% quizzes (10% each, the lowest grade will be dropped), 25% midterm exam, 30% final exam.
- **FZ Policy:** There is **no** FZ grade, everyone is entitled for the final exam.
- **Tentative Course Outline:**
 - Introduction to Operations Research and Mathematical Modeling
 - Linear Programming Models and Solution Techniques
 - Integer Programming and Network Models and Solution Techniques
 - Project Management via CPM/PERT
 - Engineering Economy
- **Rules:**
 1. Please make sure that you have a STARS password and a valid e-mail in the STARS system. All of our communications will be conducted through the STARS system. Please check your **e-mail** regularly for announcements.
 2. A **make-up** examination will only be given under extenuating circumstances (such as serious health or family problems). The student should contact the instructor as early as possible and provide the instructor with proper documentation (such as a medical note certified by Bilkent University's Health Center). The (comprehensive) make-up exam will be given during or right after the final exam period.
 3. **Cheating will not be tolerated and will be severely penalized. Disciplinary action will be taken.**

Week of	Mondays	Thursdays
January 31	Lecture (2 hrs)	Lecture (1 hr)
February 7	Lecture (2 hrs)	Lecture (1 hr)
February 14 (Quiz 1)	Lecture (2 hrs)	Lecture (1 hr)
February 21	Lecture (2 hrs)	Lecture (1 hr)
February 28 (Quiz 2)	Lecture (2 hrs)	Lecture (1 hr)
March 7	Lecture (2 hrs)	Spring break
March 14	Lecture (2 hrs)	Lecture (1 hr)
March 21 (Midterm)	Lecture (2 hrs)	No class
March 28	Lecture (2 hrs)	Lecture (1 hr)
April 4	Lecture (2 hrs)	Lecture (1 hr)
April 11 (Quiz 3)	Lecture (2 hrs)	Lecture (1 hr)
April 18	Lecture (2 hrs)	Lecture (1 hr)
April 25 (Quiz 4)	Lecture (2 hrs)	Lecture (1 hr)
May 2	Holiday	No class
May 9	Lecture (2 hrs)	Lecture (1 hr)