

# IE 400: Principles of Engineering Management – Spring 2020

- **Instructors:**

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

- **Teaching Assistants:**

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- **Class hours:**

Sec. 1 Wednesdays 13:40-15:30 (EE-03) and Fridays 15:40 - 17:30 (EE-03)

Sec. 2 Tuesdays 08:40 - 10:30 (B-206) and Thursdays 10:40 - 12:30 (B-206)

In a typical week, all **four** reserved slots will be used. Please, see the detailed schedule given at the end of the syllabus.

- **Recitations:** During lecture hours prior to each quiz and midterm.

- **Office hours:**

Sec.1 By appointment.

Sec.2 By appointment.

- **Prerequisites:** MATH 220 or MATH 223 or MATH 225 or MATH 241.

- **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 prior to quizzes and the exams. 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 quizzes and exams. TAs will solve these problems during recitations.

- **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 Mcahit, by 12:00 on Friday, February 21, 2020. 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 Xpress software (available on campus wide computers) to solve linear and integer programming problems formulated in the MOSEL modeling language (students are welcome to use Gams/CPLEX, Opl/CPLEX, AMPL/CPLEX options as well). You will be on your own in learning how to use the software. **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 and places 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 5 % attendance, 8% project, 24% quizzes (8% each, the lowest grade will be dropped), 28% midterm exam, 35% final exam.
- **FZ Policy:** You will be eligible to take the final exam only if the weighted summation of your grades from the quizzes, midterm and class participation is at least 21 points out of 57. Those who cannot satisfy this condition will get grade **FZ**.
- **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

|                               | Section 1       |                                      | Section 2       |                                          |
|-------------------------------|-----------------|--------------------------------------|-----------------|------------------------------------------|
| Week of                       | Wednesdays      | Fridays                              | Tuesdays        | Thursdays                                |
| February 3                    | Lecture (2 hrs) | Lecture (2 hrs)                      | Lecture (2 hrs) | Lecture (2 hrs)                          |
| February 10                   | Lecture (2 hrs) | Lecture (2 hrs)                      | Lecture (2 hrs) | Lecture (2 hrs)                          |
| February 17                   | Lecture (2 hrs) | Lecture (2 hrs)                      | Lecture (2 hrs) | Lecture (2 hrs)                          |
| February 24 ( <b>Quiz 1</b> ) | Lecture (2 hrs) | Lecture (2 hrs) / Recitation (2 hrs) | Lecture (2 hrs) | Recitation (2 hrs)                       |
| March 2                       | Lecture (2 hrs) | Lecture (2 hrs)                      | Lecture (2 hrs) | Lecture (2 hrs)                          |
| March 9                       | Lecture (2 hrs) | Lecture (2 hrs)                      | Lecture (2 hrs) | Lecture (2 hrs)                          |
| March 16 ( <b>Quiz 2</b> )    | Spring break    | Lecture (2 hrs) / Recitation (2 hrs) | Spring break    | Recitation (2 hrs)                       |
| March 23                      | Lecture (2 hrs) | Lecture (2 hrs)                      | Lecture (2 hrs) | Lecture (2 hrs)                          |
| March 30 ( <b>Midterm</b> )   | Lecture (2 hrs) | Recitation (2 hrs)                   | Lecture (2 hrs) | Recitation (2 hrs)                       |
| April 6                       | Lecture (2 hrs) | Lecture (2 hrs)                      | Lecture (2 hrs) | Lecture (2 hrs)                          |
| April 13                      | Lecture (2 hrs) | Lecture (2 hrs)                      | Lecture (2 hrs) | Lecture (2 hrs)                          |
| April 20 ( <b>Quiz 3</b> )    | No class        | Recitation (2 hrs)                   | Lecture (2 hrs) | Holiday / Recitation (2 hrs) (on Friday) |
| April 27                      | No class        | Holiday                              | No class        | No class                                 |
| May 4                         | No class        | No class                             | Lecture (2 hrs) | Lecture (2 hrs)                          |
| May 11 ( <b>Quiz 4</b> )      | No class        | Lecture (2 hrs) / Recitation (2 hrs) | No class        | Recitation (2 hrs)                       |
| May 18 ( <b>Oral Exams</b> )  |                 | TBA                                  |                 | TBA                                      |

- **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. **No make-up will be given for quizzes under any circumstances.**
  4. **Cheating will not be tolerated and will be severely penalized. Disciplinary action will be taken.**
  5. **As a courtesy, please turn off your cell phones during class.**