

IE 400: Principles of Engineering Management –Summer 2020

- **Instructor:**

Bahar Yetiş Kara, Office: EA311, E-mail: bkara@bilkent.edu.tr

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

- **Teaching Assistant:**

İrem Nur Keskin, Office: EA327, E-mail: irem.keskin@bilkent.edu.tr

- **Class hours:**

Mondays 08:40-10:30 (EA-Z01), Tuesdays 15:40 - 17:30 (EA-Z01) and Thursdays 10:40-12:30 (EA-Z01)

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

- **Office hours:** 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.

- **Quizzes:** There will be a total of 4 scheduled quizzes during class hours. **There is no make-up of the quizzes!**

- **Study Sets:** Study sets will be assigned prior to quizzes. 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.

- **Project:** The project assignment (due sometime towards the end of the semester) will be a group project involving **at most 3** students. 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 a comprehensive final exam some time during the final exam period. The exact dates and places will be announced during the semester.

- **Tentative Grading Scheme:**

Type of Assesment	Count	Total Contribution
Quiz	4	30
Project	1	15
Participation and in-class pop quizzes	1	15
Final	1	40

- **Tentative Course Outline:**

Date	Week	Lecture	Topic
June 29	Week1	Lecture 1	Modeling of LP Problems
June 29		Lecture 2	
June 30		Lecture 1	Modeling of LP Problems
June 30		Lecture 2	
July 2		Lecture 1	Graphical Solution to 2-variable LP Problems
July 2		Lecture 2	

July 6	Week2	Lecture 1	Solving Study Set 1
July 6		Lecture 2	
July 7		Lecture 1	Quiz 1
July 7		Lecture 2	
July 9		Lecture 1	Simplex Method to Solve LP Problems
July 9		Lecture 2	

July 13	Week3	Lecture 1	Simplex Method to Solve LP Problems
July 13		Lecture 2	
July 14		Lecture 1	Integer Programming
July 14		Lecture 2	
July 16		Lecture 1	Quiz 2
July 16		Lecture 2	

July 20	Week4	Lecture 1	Integer Programming
July 20		Lecture 2	
July 21		Lecture 1	Networks Models and Solution Techniques
July 21		Lecture 2	
July 23		Lecture 1	Networks Models and Solution Techniques
July 23		Lecture 2	

July 27	Week5	Lecture 1	Solving Study Set 3
July 27		Lecture 2	
July 28		Lecture 1	Quiz 3
July 28		Lecture 2	

August 4	Week6	Lecture 1	Project Management
August 4		Lecture 2	
August 6		Lecture 1	Engineering Economy
August 6		Lecture 2	

August 10	Week7	Lecture 1	Dynamic Programming
August 10		Lecture 2	
August 11		Lecture 1	Quiz 4
August 11		Lecture 2	
August 13		Lecture 1	Project Presentations
August 13		Lecture 2	

August 17	Week8	Lecture 1	Project Presentations
August 17		Lecture 2	

- **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.**