

IE 400: Principles of Engineering Management – Summer 2021

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.

- **Instructor:**

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

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

- **Teaching Assistant:**

Büşra Bayrak, Office: TBA , Office Hours: TBA, E-mail: busra.bayrak@bilkent.edu.tr

- **Class hours:** Mondays 10:30-12:20, Wednesdays 08:30-10:20, Thursdays 15:30-17:20

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 6 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 will be announced during the semester.

- **Tentative Grading Scheme:**

Type of Assesment	Count	Total Contribution
Quiz	6	30
Project	1	15
Participation and in-class pop quizzes	1	15
Final	1	40

- **Tentative Course Outline:**

Date	Week	Lecture	Topic
June 7	Week 1	Lecture 1	Modeling of LP Problems
June 7		Lecture 2	
June 9		Lecture 1	Modeling of LP Problems
June 9		Lecture 2	
June 10		Lecture 1	Graphical Solution to 2-variable LP Problems
June 10		Lecture 2	

June 14	Week 2	Lecture 1	Class Exercises Modelling
June 14		Lecture 2	
June 16		Lecture 1	Simplex Method to Solve LP Problems
June 16		Lecture 2	
June 17		Lecture 2	Quiz 1 LP & Graphical
June 17		Lecture 3	

June 21	Week 3	Lecture 1	Simplex Method to Solve LP Problems
June 21		Lecture 2	
June 23		Lecture 1	Integer Programming
June 23		Lecture 2	
June 24		Lecture 2	Quiz 2 Simplex
June 24		Lecture 3	

June 28	Week 4	Lecture 1	Integer Programming
June 28		Lecture 2	
June 30		Lecture 1	Networks Models and Solution Techniques
June 30		Lecture 2	
July 1		Lecture 2	Quiz 3 IP
July 1		Lecture 3	

July 5	Week 5	Lecture 1	Networks Models and Solution Techniques
July 5		Lecture 2	
July 7		Lecture 1	Project Management
July 7		Lecture 2	
July 8		Lecture 2	Quiz 4 Networks
July 8		Lecture 3	

July 12	Week 6	Lecture 1	Quiz 5 Project Management
July 12		Lecture 2	
July 14		Lecture 1	Engineering Economy
July 14		Lecture 2	

July 26	Week 7	Lecture 1	Quiz 6 Engineering Economy
July 26		Lecture 2	
July 28		Lecture 1	Dynamic Programming
July 28		Lecture 2	
July 29		Lecture 1	Project Presentations
July 29		Lecture 2	

August 2	Week 8	Lecture 1	Project Presentations
August 2		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.**