IE 400: Principles of Engineering Management – Fall 2021

Very Important:
As per the university-wide precautionary health guidelines, all students are asked:

1. ***To sit in the same seat each lecture.*** Once students' seating plans are finalized, all students will be asked to use an SRS service to enter the Bilkent ID numbers of their colleagues seated immediately around them in all of their courses. This is very important for effective testing and tracing.

2. ***To keep their masks on their faces at all times during a class.*** Please note that according to a Senate decision, faculty members can initiate a disciplinary investigation for those students who refuse to follow this precaution strictly.

3. ***Not to come to class if they are "not allowed on campus"*** due to HES code risk, positive diagnosis, and in the case of unvaccinated students, failure to provide a negative test result in a timely manner. Such prohibited students ***can not be present*** in the classroom, and if they are, they will be asked to leave the campus immediately and the incident will be reported to the department.

- **Instructors:**

  Sec. 1 & 2 Taghi Khaniyev, Ext: 1702, Office: EA207, e-mail: `taghi.khaniyev@bilkent.edu.tr`

  Sec. 3 Özlem Karsu, Ext: 1960, Office: EA331, e-mail: `ozlemkarsu@bilkent.edu.tr`

- **Course Web Page:** TBA

- **Teaching Assistants:**

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

  Deniz Şahin, Office: TBA , Office Hours: TBA, e-mail: `deniz.sahin@bilkent.edu.tr`

  Undergraduate Tutor: Elif Rana Yöner, Office: TBA , Office Hours: TBA, e-mail: `rana.yoner@ug.bilkent.edu.tr`

- **Class hours:**

  Sec. 1 Mondays 10:30-12:20 (EA-Z03) and Wednesdays 15:30-17:20 (EA-Z03)

  Sec. 2 Mondays 13:30-15:20 (B-Z02) and Thursdays 8:30-10:20 (B-Z02)

  Sec. 3 Tuesdays 15:30-17:20 (B-Z02) and Fridays 10:30-12:20 (B-Z02)

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

- **Office hours:**

  Sec. 1& 2 By appointment.

  Sec. 3 By appointment.

- **Prerequisites:** There are no formal prerequisites for this course. However, 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 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.

- **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, 2 and 3 combined. Please form your project groups as soon as possible and e-mail the names of your group members to Rana, by 12:00 on Friday, October 10, 2021. 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 Pyhton/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 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 20% project, 30% quizzes (10% each, the lowest grade will be dropped), 20% 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

Week of	Section 1		Section 2		Section 3	
	Mondays	Wednesdays	Mondays	Thursdays	Tuesdays	Fridays
September 20	No class	Lecture (2 hrs)	No class	Lecture (2 hrs)	No class	Lecture (2 hrs)
September 27	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)
October 4	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)
October 11 (**Quiz 1**)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)
October 18	Lecture (2 hrs)	No class	Lecture (2 hrs)	No class	Lecture (2 hrs)	No class
October 25	No class	No class	No class	No class	No class	Holiday
November 1 (**Quiz 2**)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	No class	Lecture (2 hrs)
November 8	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)
November 15 (**Midterm**)	Lecture (2 hrs)	No class	Lecture (2 hrs)	No class	Lecture (2 hrs)	No class
November 22	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)
November 29	No class	Lecture (2 hrs)	No class	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)
December 6 (**Quiz 3**)	Lecture (2 hrs)	No class	Lecture (2 hrs)	No class	Lecture (2 hrs)	No class
December 13	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)
December 20	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)	Lecture (2 hrs)
December 27 (**Quiz 4**)	No class	Classes over	No class	Classes over	No class	Classes over
January 3 (**Oral Exams**)	TBA		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.**