Preliminary Syllabus IE405, Decision sciences
Fall semester 2023-2024

1 Instructor and Teaching Assistants

Instructors
Hans Frenk

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Office  FENS G052
Phone  02164839520

Teaching assistant:

2 Office hours

1. Office hours instructor: By appointment. Preferable after lecture.
2. Online office hours TA: By appointment on certain days to be announced
3. One week before the exam additional office hours will be held.

3 Time and Venue

1. Lectures
   Monday  10.40 – 11.30  Room: FASS G052
   Wednesday  15.40 – 17.30  Room: G030 Cinema Hall

2. Recitations
   IE405R-A  Monday FENS L061 17.40 – 18.30  TA
   IE405R-B  Wednesday FENS L061 17.40 – 18.30  TA
   IE405R-C  Tuesday FENS L055 18.40 – 19.30  TA
   IE405R-D  Friday FENS L061 17.40 – 18.30  TA

4 Textbook

Discussed in class: We will discuss most of the topics listed in the course book Clemen and Riley making hard decisions in a different order and more general in the course notes Modelling and the course notes Introduction to Probability theory and its connection to Decision Sciences. During the course we will announce which parts of Reilly we are covering.

5 Lecture slides

Slides and coursenootes will be uploaded on SUCourse+ in folder lecture notes and exercises and part of the solutions of the exercises in folder recitations.

6 Course Description

This course provides a broad practical overview of topics and techniques in the field of decision analysis. As an engineering course for undergraduate students, the course will address technical subjects that can be found in management science and operations research domains. At the end of the term, the students will be able to formulate decision-making problems that have multiple decisions in time, uncertain events, and different objectives. The preliminary course topics covers the material listed below. We might not be able to discuss the Advanced Topics due to time limitations.

List of Topics
Structuring Decisions

• Elements of decision problems (objectives, alternatives, consequences etc.)
• Decision trees
• Sensitivity analysis

Modeling Uncertainty

• Probability review
• Bayesian inference
• Value of information
• Subjective probability
• Monte Carlo simulation

Modelling Preferences

• Risk attitudes
• Utility theory
• Conflicting objectives

Advanced Topics

• Analytical Hierarchy Process – AHP
• Decision heuristics and biases
• Judgment under uncertainty

7 Recitations

• Students must attend the recitation sessions they have registered for. No attendance will be taken. It is advised that students attend the recitation.

• Recitations are supposed to be an active learning environment. Your behavior will be monitored by the TA. If you misbehave during recitations, this will be reported to the instructor and appropriate measures will be taken. In extreme cases, this may even affect your course grade.

• Part of the solutions of the exercises will be uploaded to Sucourse+ after the recitation sessions.

8 Exams and Course Policies

1. There will be one midterm and one final and no quizzes. There will be no makeup for the midterm. The weight of each midterm is 50%, and that of the final is 50%.

   The date and times of the midterm are not known yet but will be announced within two weeks.

   Final exam will be announced by the Student Resources.

2. Make-up policy

   There will be a make-up exam after the final exam. The make-up exam grade will replace all your missing exam grades.

   If you miss an exam, you do NOT need to contact the instructors to explain the reason.

   It is STRONGLY recommended that you take both midterms and final as scheduled. The make-up exam will be cumulative and more difficult.

   The date of the make-up exam will be announced after the final exam. It will most likely be within two days after the end of the final exam period.

3. Students whose exams answers seem suspicious can be called for an oral exam with the instructor. The oral exam questions will not be limited only to the suspicious answers in exams; the instructor may ask other questions to evaluate the student’s understanding of course material. If the student performs badly in the oral exam he will not pass this course and receives F.
4. It is students’ responsibility to follow all the announcements made in class and those made via SUCourse+.

5. Do not underestimate this course. It might be different from the past. It is advised that you study regularly every week next to going to classes and attending the recitation session. If you do not fully understand the material you should make AN APPOINTMENT with the TA during the scheduled office hours sessions (see point 2) or your instructor immediately after class.

6. Honesty is regarded the best policy