

MA 417G-002 Spring 2018

Decision Making Under Uncertainty

Instructor

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Office hours: Monday and Wednesday 4:30-5:30 pm, Friday 3-4 pm, or by appointment

Textbook

Operations Research: An Introduction, by Hamdy A. Taha (**8th Edition**)

You could also use a later edition of the textbook. The textbook is required, but not the access to the companion website.

I will also provide a list of additional reading material that will be posted on Canvas.

Prerequisite

MA/STA 320, or consent of instructor. I will not enforce the formal prerequisites, for the benefit of those students in other majors who are interested in optimization but did not go through the standard sequence of math courses. However, excellent knowledge of the prerequisites is crucial for succeeding in MA 417.

Grading

Your grade in the course will be based on the following.

- **10% Participation**
- **20% Homework**
- **40% Midterm exams**
- **30% Final exam**

Grading scale: 90 – 100% = A; 80 – 89% = B; 70 – 79% = C; 60 – 69% = D; Below 60% = E

Topics

- Course introduction and review of basic probability (class notes + Chap. 12).
- Decision making using expected values and the value of information (Chap. 13 + class notes) [HW 1].
- Expected utility (class notes) [HW 2].
- Dynamic programming (Chap. 10) [HW 3].
- Inventory problems (Chap. 11, 14) [HW 4].
- Markov chains (Chap. 17) [HW 5].

Exam Dates (Tentative!)

- Midterm 1 (in class): during the week of Feb 12-16.
- Midterm 2 (in class): during the week of March 26-30.
- Final exam: According to the Registrar.

No make-up exam will be given except in the case of an excused absence on the day of the exam. Senate Rules 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor. Students may be asked to verify their absences in order for them to be considered excused.

Homework

I will assign required reading from the textbook and weekly problems that you do not need to turn in (but you do need to do, if you want to do well on the exams). Moreover, there will be five homework assignments that will be collected and graded. You can work on these assignments in groups of no more than three students per group. In fact, you can turn in a single assignment per group. Some assignments will be longer and more difficult than others. Therefore, the assignments will not be weighted equally. No late homework assignment will be accepted.

Software

Some assignments will contain a computational component. You may use any software of your choice, such as Python, SageMath, AMPL, SCIP, R, C, Excel, Maple, Mathematica or any other programming language to solve the problems.