MA 417G-001 Spring 2019

Decision Making Under Uncertainty

Instructor

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

Textbook

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

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.

- **30% 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].
- Markovian decision process (class notes + Chap. 23) [optional HW 6].

Exam Dates

- Midterm 1 (in class): 15 Feb.
- Midterm 2 (in class): 29 Mar.
- Final exam: 8:00-10:00am, 2 May.

No make-up exam will be given except in the case of an excused absences 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

The homework has two equally important components, one graded, the other non-graded.

There will be five (plus one optional) graded homework assignments. Some assignments will be longer and more difficult than others. Therefore, the assignments will not be weighted equally. Some assignments will contain a computational component. No late homework assignment will be accepted.

In addition to the graded assignments, I will assign required reading from the textbooks and weekly problems that you do not need to turn in. Although these problems will not be graded, working on them will substantially improve your performance in this class.

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.

Students with Disabilities

If you have a documented disability that requires academic accommodations, please see your instructor as soon as possible. In order to receive accommodations in this course, you must provide your instructor with a Letter of Accommodation from the Disability Resource Center. The Disability Resource Center coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at drc@uky.edu. To access their web site click here .

Academic Integrity and Cheating

Please see the University of Kentucky Policy on Academic Integrity and Cheating here .

Recording in the Classroom

Video and audio recordings are not permitted during the class unless the student has received prior permission from the Professors. If permission is granted, recording of other students is prohibited. Any distribution of recordings is also prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the professor. All content for this course, including handouts, assignments, and powerpoint lectures are the intellectual property of the instructors and cannot be reproduced, sold, or used for any purpose other than educational work in this class without prior permission from the professor.