ECONOMICS 172A: Introduction to Operations Research (Part A)   Winter 2022

Instructor: Herb Newhouse (hnewhouse@ucsd.edu)   Course webpage: https://canvas.ucsd.edu/
Lectures: MWF 8:00 – 8:50 am in WLH 2204   Discussions: W 2:00 – 2:50 pm

TA: Songyu He (soh038@ucsd.edu)
Grader: Tyler Paul (tlpaul@ucsd.edu)
The instructor and TA office hours will be held online. Further information will be posted on Canvas.

Economics 172A is the first course in the two-quarter Operations Research sequence. It covers linear and integer programming. Linear and integer programs are types of mathematical optimization problems. The class will introduce you to the problem, teach you how to formulate economic problems as linear programming problems, teach you how to solve these problems, and teach you how to interpret the solutions to these problems.

Prerequisites:

ECON 100A; and ECON 120A or ECE 109 or Math 180A or Math 183 or Math 186; and Math 20F. Note that credit is not allowed for both ECON 172A and MATH 171A.

Lectures, Discussion Sections and Review Sessions:

You are responsible for all the material covered in lecture and in the problem sets. Partial notes will be available on the class webpage before each lecture. I recommend that you print these out beforehand and fill in the missing information. I'll do my best to avoid typos but you're responsible for the correct material. I want you to understand the material instead of simply memorizing it. If you miss a lecture, borrow someone's notes. We will schedule a review session for each exam. Discussion sections are optional but recommended.

Lectures will be held on Zoom during the first two weeks of the quarter. I am planning to hold lectures in person as soon as the University allows. Lectures, discussion sections and review sessions will be recorded.

Grading:

My prediction of how I will assess you in this course is:

Your grade will be determined based on two midterm exams and a final exam. Each of your two highest exams will count as 40% of your overall grade; your lowest exam will count as 20% of your overall grade. If you miss an exam for a documented, university approved reason (ie., illness, official university trip), you will need to take a make-up exam. The make-up exam could include written and oral components. If you miss an exam for another reason (ie., oversleep, forget the time), you will receive a zero on the exam.

Midterm 1 will be held during a window that includes our class hours on Monday, January 24th. Midterm 2 will be held during a window that includes our class hours on Friday, February 18th. The final exam will be held on Monday, March 14th during a window that overlaps our officially scheduled time between 8:00 am and 11:00 am. I expect that each midterm will last approximately 40 minutes and that the final exam will last approximately 60 minutes. I also expect that most students will need approximately 10-20 minutes for setup and submission. If you know in advance that you cannot make an exam, please let me know as soon as possible.

You are only permitted to use pens and pencils, a straight edge, a **single** note sheet and a calculator during each exam. The note sheet can be any physical size up to 8.5" by 11". It may **only** have handwritten notes on both sides. Typed or mechanically reproduced notes are not permitted. Do **not** attach anything to your note sheet.

While I will do what I can to keep to the predicted assessments for this course, the evolving situation may make it necessary for me to make changes.

Academic dishonesty:

I take academic dishonesty seriously. Any student found guilty of academic dishonesty will most likely earn a failing grade for the course. In addition to this sanction, the Council of Deans of Student Affairs will also impose a disciplinary penalty. For a review of UCSD policy, please see http://www-senate.ucsd.edu/manual/appendices/app2.htm.

We will likely use Zoom for proctoring this quarter. It uses video and audio recording or other personal information capture for the purpose of facilitating the course and/or test environment. UC San Diego does not allow vendors to use this information for other purposes. Recordings will be deleted when no longer necessary. However, if cheating is suspected, the recording may become part of the student's administrative disciplinary record

A TA or I may request a copy of your exam recordings. Failure to provide us with a copy upon request will result in a grade of zero on the corresponding exam. **You must keep a copy of your exam recordings until Friday, June 10th, 2022.** Zoom recordings that are automatically saved to the cloud are deleted after a certain amount of time. If you save any of your exam recordings to the cloud, make sure you download them locally so that you can provide them to us if you are requested to do so.

Finally, I reserve the right to give an oral test if I feel it is necessary to uphold academic integrity.

Regrade requests:

Regrade requests may be submitted via Gradescope during the weeklong regrade period. The regrade period will probably begin a day or two after the exam results are made available to the class. Please do not contact the instructor or any of the TAs regarding the grading of an exam or the grading for the course before the regrade period begins. If your TA agrees with your request, your score for that question will be corrected. If your TA disagrees with your request, you will lose 1 point for each midterm question and 2 points for each final exam question.

Text:

Introduction to Operations Research, 10th Edition, Hillier and Lieberman, McGraw-Hill. I will give references for the 10th edition but other recent editions should also be fine. The material for this course is fairly standard; other Operations Research texts are also likely to be helpful.

Problem Sets:

Problem sets will be available online. We will go over these questions in office hours and in the discussion sections. Your best practice for the exams is to try these questions yourself first.

Preliminary Course Outline:

1. Introduction/Problem Formulation (Ch 1 – 3)

2. Duality Theory and Sensitivity Analysis (Ch 6)

3. Integer Programming (Ch 11)

4. The Transportation and Assignment Problems (Ch 8)

5. Network Optimization Models (Ch 9)

(A more detailed list of the readings will be given with each set of notes and posted on Canvas.)