Math 20: Introduction to Linear Algebra and Multivariable Calculus

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Staff

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Why you should take this course

Topics and Goals

In this course we will focus on the multivariable techniques of problem solving in the social sciences.

We will cover are the highlights of linear algebra, including vectors, matrices, and applications. We will also learn the calculus of functions of several variables, including partial derivatives, constrained and unconstrained optimization, and applications.

We will also pay heavy attention to applications, including traffic flow, game theory, the assignment problem, linear programming, Markov chains, and baseball.

Prerequisites, Exrequisites, and Perquisites

To enter into Math 20 you will need a background in one-variable calculus, such as Mathematics 1b or equivalent, or an A or A- in Mathematics 1a, or a 5 on the AB or a 3 or higher on the BC Advanced Placement Examinations in Mathematics.

The Economics department requires this course or Math 21a to take Ec 1011ab. But since this course covers parts of Math 21a and 21b, you should probably choose between 20 and the full year of 21ab.

Technology

As the real-life problems in science involve a lot of calculations, we are also going to learn how to use computers to help. Excel, Mathematica, and Matlab will be used in class and on certain assignments.

Factors determining your grade

Homework

Homework will be assigned each class meeting and due the next class meeting. It will be returned, graded, at the following class meeting. Solutions will be made available on the course web site. Late homework will not be accepted. The lowest three homework scores will be dropped.

There will be three computer assignments as well, which will be due on October 8, November 1, and December 13. Though they run on a different schedule, they will be counted as regular assignments.

Exams

There will be three hourly exams, on October 25, November 22, and December 17. The final exam will be in January and will be cumulative.

Projects

Students will prepare a research paper in which they analyze a real-world problem using techniques learned in the course. The project will be due on December 20.

Weights

15%	Hourly Exam I
15%	Hourly Exam II
15%	Hourly Exam III
25%	Final Exam
15%	Homework
15%	Project
100%	**Total**

Texts

- Linear Algebra and its Applications by David Lay. 3rd edition, Addison/Wesley, ISBN 0-201-70970-8. Available at the Harvard Coop or various online bookstores.

- One chapter (Chaper 11, "Partial Derivatives") of Multivariable Calculus - Concepts and Contexts, by James Stewart. 2nd edition, Brooks/Cole, ISBN˜0-534-37863-3. This excerpt is for sale at the Coop.

Conclusion

We hope you take and enjoy Math 20 this semester.