

Economics 630 – Mathematics for Economists (Master’s section)

Course: ECON 630 (Th, 7:20 – 10 pm)

Term: Fall 2019

Class meets at Van Metre Hall (formerly Founders Hall) room 111 on Thursdays, from 7:20 pm to 10 pm

Instructor: Natalya Naumenko

Office Hours: Carrow Hall office 10 (by appointment). Thursday: 6—7 pm Arlington campus

Email: nnaumenk@gmu.edu (Please include “630” in the subject line). On weekdays I check my email twice a day (at around noon and at around 5 pm). Please plan accordingly

Website: I will use Blackboard for all course-related materials

Course description:

The primary goal of this course is to introduce a modern language widely used in economics: the language of mathematics. Economists use only a narrow set of idioms and expressions in this rich language, and we’ll focus on the most important ones: linear algebra, multivariate calculus, and probability. By gaining comfort with this language, you will be able to read academic articles yourself, without having to depend on third- or fourth-hand translations written by other economists or by journalists.

Books:

Alpha C. Chiang and Kevin Wainwright, *Fundamental Methods of Mathematical Economics*, fourth edition.

Recommended but not required:

Edward T. Dowling, *Schaum's Outlines: Introduction to Mathematical Economics*, third edition. You can never have too many solved problems. An inexpensive way to practice the skills you'll be building.

Course outline (preliminary and subject to change):

- Week 1 (August 29) – Introduction, sets, functions (Ch 1-2)
- Week 2 (September 5) – Static equilibrium (Ch 3)
- Week 3 (September 12) – Intro to linear algebra (Ch 4)
- Week 4 (September 19) – Intro to derivatives, rules of differentiation (Ch 6-7)
- Week 5 (September 26) – Intro to derivatives, rules of differentiation (Ch 6-7)
- Week 6 (October 3) – Comparative static analysis (Ch 8)
- Week 7 (October 10) – Optimization (Ch 9-10)
- Week 8 (October 17) – **midterm**
- Week 9 (October 24) – Intro to integral calculus (Ch 14)
- Week 10 (October 31) – Intro to integral calculus (Ch 14)
- Week 11 (November 7) – Intro to probability
- Week 12 (November 14) – Intro to game theory

- Week 13 (November 21) – Intro to game theory
- Week 14 (November 28) – Thanksgiving week, no class
- Week 15 (December 5) – review session

Grading

Midterm – 40%

Final – 60%

The midterm will cover the material from weeks 1 – 7. The final exam will cover the whole course. All exams are closed-book.

Final exam:

The final exam will be on Thursday, December 12, from 7:30 pm to 10:15 pm

Homework:

Every one or two weeks I will assign a problem set. Problem sets will *not* be graded, they are for your practice only.

Academic Ethics:

Cheating hurts the best students – they cannot distinguish themselves from the cheaters. Please note that you are at an Honor Code university. You are expected to conduct yourself in a manner that is consistent with the learning mission of the University. All forms of academic dishonesty are strictly forbidden. This includes but is not limited to the following: communicating with other students during exams; unapproved references to books, notes or “cheat sheets” during exams; and plagiarism – representing another person’s work as your own. You should be aware that plagiarism is often easy to recognize. For further information on academic ethics, please consult the student handbook.

Disability accommodations:

Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University. If you are seeking accommodations, please visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email:ods@gmu.edu | Phone: (703) 993-2474

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email:ods@gmu.edu | Phone: (703) 993-2474

Class Attendance, Missed Exams:

Class attendance is not mandatory, if you feel comfortable with the material you are more than welcome to just review the corresponding chapters in the book. Please keep in mind that I do not use slides, I write on the whiteboard. As a rule, I will not offer make-up exams or early exams.

Further reading:

Avinish K. Dixit, *Optimization in Economic Theory*. A short classic that covers most of this semester's topics in 183 fast-moving, elegantly written pages.

David Kreps, *A Course in Microeconomic Theory*. The first few chapters of this text give a slow, masterful, coverage of the basics of the microeconomic theory of choice.

Hal Varian, *Microeconomic Analysis*. If you're looking to speak the language of microeconomics, this is a great place to start.

Schaum's Outline of Probability and Statistics. Recommended if you've never seen probability or statistics before.