Department of Economics and Finance

ECON*2770.02
Introductory Mathematical Economics
Fall 2013

Instructor: Michael Hoy
Office: MacKinnon 701
Ext. 52169, e-mail: mhoy@uoguelph.ca
Office Hours (tentative): Mondays and Wednesdays 1:00 to 3:00 (or by arrangement)

E-mail: mhoy@uoguelph.ca (**NOTE:** You **MUST** include the course number or name in the subject heading of any e-mail you send me or I may inadvertently delete it without opening it.)

It is your responsibility as a student to be aware of and to abide by the University's policies regarding academic misconduct, e-mail communication, maintaining copies of out-of class assignments, what to do when you cannot meet a course requirement and the drop date for this semester. To better understand these policies, visit:

http://www.uoguelph.ca/economics/node/1115

Course Outline

Course Description:

The course aims to provide students with the basic mathematical tools required for elementary theoretical economic analysis. The mathematics largely covers calculus and matrix algebra. The emphasis is not only on the mathematics but also on the building and solution of economic models.

Textbooks

Mathematics for Economics, (required)
3rd edition, Hoy, Livernois, McKenna, Rees, and Stengos, MIT Press, 2011.

Student's Solutions Manual (e-book, not required, only recommended),
3rd edition, Hoy, Livernois, McKenna, Rees, and Stengos, MIT Press, 2011
Website for MIT Press to order student solutions manual e-book:
http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=12972

PREREQUSITES: ECON*1100, ECON*1050, MATH*1000 or MATH*1080 or MATH*1200.

COURSE REQUIREMENTS: There will be five short quizzes in lectures, a midterm, and a final exam. The weights on these requirements **(and tentative dates)** are as follows:

Maple TA Assignments (weekly)	Best 10 of 11 (no make-ups offered)	20%
Quizzes (weekly - approximately)	Best 4 of 5 (no make-ups offered)	10%
Midterm	Date (Tentative): Oct. 16, in class	20%
Total Term Work		**50%**
Final Exam	Dec. 13 from 2:30-4:30 pm	**50%**

Tentative Dates for Quizzes:

(NOTE: quizzes may be at the beginning of the lecture and so if you are late you will miss it and no make-up quizzes will be made available.)

Quiz 1, in lecture on September 25.
Quiz 2, in lecture on October 9.
Quiz 3, in lecture on October 25
Quiz 4, in lecture on November 8.
Quiz 5, in lecture on November 22.

IMPORTANT NOTES:

1. If your performance on the final exam is better than your term work (quizzes plus midterm), **and you pass the final exam**, the weights will be shifted to 25% for term work and 75% for the final examination.

WARNING: Do not become complacent because of this opportunity. Most people do better on the quizzes and assignments than they do on the final exam; and falling behind makes it difficult to do well at all in the course.

2. The quizzes will be written in class on dates to be determined. If you miss a quiz for a reasonable compassionate or medical reason, the weight for that quiz may be shifted to the final exam. Depending on when you can write a make-up quiz in such a case, you may be permitted to write the exam at another time. The final exam will be comprehensive and based on the entire course with somewhat more weight on the part after the midterm.

3. The learning objectives are achieved initially through lectures, which will include presentation of material and working through examples. Simple memorisation of formulae only will not produce good results. The only way to learn mathematics and economics is by DOING mathematics and economics. I shall be giving weekly exercises (in the form of Maple TA exercises). They are worth 20%, but more important than the marks, they will be essential preparation for the midterm and final exams. In addition, the labs will be used for going through some of the exercises. Labs will be held most weeks starting the week of September 16 to 20. You must attend the lab to which you have been assigned.

4. Remember that the course is about mathematical techniques AND their application to economics. Formulating an economic problem mathematically is a challenging but an immensely useful skill. As the course evolves, you will see more and more links with the theories you are encountering or have encountered in intermediate micro and macro courses.

5. It is very important to keep up with the course. The exercises and quizzes will help you pace yourself. Don't fall behind!

6. e-mail protocol: I am happy to receive queries by email. However, please note that the subject line must contain ECON*2770, and you must use your U of G account, otherwise the e-mail will be deleted. Also, if many messages on the same theme are received, I will respond in class and will not make individual replies. Restrict messages to small questions about course content and requests for an appointment only. Entire topics will not be explained by e-mail, substantial questions will be taken only in person during office hours or by appointment. If you have requests for special consideration, questions about your standing in the course, or other matters requiring discussion you must see me personally. My e-mail is mhoy@uoguelph.ca

7. You will be asked to complete an evaluation for this course sometime during the last two weeks of classes. The Department of Economics' policy regarding the conduct and use of these evaluations can be found at:

http://www.uoguelph.ca/economics/academics/courses/course-evaluation

8. The course starts with some `Review' material. Most of this is entirely your responsibility, as indicated in the course contents below.

COURSE CONTENT

Review (little economics, mostly math background): student's responsibility

1. Basic arithmetic and algebra: Hoy, et al., Ch 1 (pp. 3 -10)

2. Sets, subsets, functions: Hoy, et al., Ch 2.1 - 2.4 (pp. 11 - 60)

3. Continuity of functions of one variable with economic applications:
   Hoy, et al., Ch 4 (pp. 100-126)

Regular course material (more economic examples and applications):

4. Sequences and limits:
   Hoy, et al., Ch 3 (pp. 61-99)

5. Derivatives and differential for functions of one variable:
   Hoy, et al., Ch 5

6. Unconstrained optimization of functions of one variable:
   Hoy, et al., Ch 6 (excluding pp. 217 - 219)

7. Systems of linear equations:
   Hoy, et al., Ch 7

8. Matrices:
   Hoy, et al., Ch 8

9. Determinants and the inverse matrix:
   Hoy, et al., Ch 9

10. Calculus for functions of n-variables:
    Hoy, et al., Ch 11.1 - 11.5 (excluding elasticity of substitution pp. 461-463)

11. Optimization of functions of n-variables:
    Hoy, et al., Ch 12

12. Constrained optimization:
    Hoy, et al., Ch 13 (omit Dual pp. 513 - 514) but include Interpretation of λ

13. Comparative Statistics
    Hoy, et al., Ch 14

In keeping with the University's Learning Outcomes, the Department of Economics and Finance Learning Outcomes (skills and knowledge competencies) for this course are:

Skills:

1) Written Communication

Many questions posed in lectures, midterms, quizzes and practice assignments require economic interpretation of the answers. Students obtain significant experience in developing logical statements about the economic (and mathematical) models and their results.

2) Analytical Problem Solving

The main emphasis of this course is the learning of mathematical tools and their relationship to economic analysis. Students obtain extensive experience in lectures, midterms, quizzes and practice assignments developing their ability to solve problems analytically.

3) Numerical Problem Solving

This course is designed to teach mathematical tools and their relationship to economic analysis. Students obtain extensive experience in lectures, midterms, quizzes and practice assignments developing their ability to solve problems numerically. These are typically done as examples of more general mathematical models. See point 2) above.

Knowledge:

1) Mathematical Techniques and Understanding

A principle main goal of this course is for students to attain knowledge of mathematical techniques, such as unconstrained optimization in one variable and several variables, constrained optimization, and linear algebra. The expectation is that students not only learn the methods for the purpose of short term recall but to develop a strong understanding of the mathematic principles involved in order to facilitate further learning and application of the material beyond this course in future economics (and other) courses.

2) Economic Modeling

Equally important as the goal in point 1) above, we expect students to attain knowledge of economic modeling in a way that facilitates a deep and critical perspective of proposed economic analysis both in economic courses and more broadly in economic discourse