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Office Hours (tentative): Tuesdays and Thursdays 1:00 to 3:00 and by appointment

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:

https://www.uoguelph.ca/registrar/calendars/undergraduate/2015-2016/index.shtml

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 elementary analysis and matrix algebra. The emphasis is not only on the mathematics but also on the building and solution of economic models.

Lectures: Tuesdays and Thursdays 10am to 11:20am, MCKN 120

Lab Schedule: ECON*2770*0101 – Friday 11:30am-12:20pm MINS 017
ECON*2770*0102 – Friday 10:30am-11:20am MCKN 238
ECON*2770*0103 – Friday 09:30am-10:20am ALEX 259

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:
https://mitpress.mit.edu/books/student-solutions-manual-mathematics-economics

Instructor: A. Papanastasiou

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

COURSE REQUIREMENTS: There will be five short quizzes in class, eleven online (Maple TA) assignments, 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 (biweekly - approximately)	Best 4 of 5 (no make-ups offered)	10%
Midterm	Date (Tentative): Feb. 26	20%
Total Term Work		**50%**
Final Exam	Apr. 12, 2:30 to 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 January 21.
Quiz 2, in lecture on February 4.
Quiz 3, in lecture on February 25.
Quiz 4, in lecture on March 10.
Quiz 5, in lecture on March 24.

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. If you miss a quiz for a reasonable compassionate or medical reason, the weight for that quiz may be shifted to the final exam. The final exam will be comprehensive and based on the entire course. The labs will be used for going through some of the exercises. Labs will be held most weeks starting the week of January 11 to 15.

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. <u>The only way to learn mathematics and economics is by DOING mathematics and economics.</u> I shall be giving weekly exercises (in the form of Maple TA

exercises). They are worth 20%, but more importantly, they will be essential preparation for the midterm and final exams.

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 assignments and quizzes will help you pace yourself. **Don't fall behind!**

6. 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:

https://www.uoguelph.ca/economics/course-evaluation

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

8. Assignments in this course will make use of the online application **Maple TA**, which is accessible from the Maple TA link, located in the top navigation bar in Courselink. Click the Maple TA link in the top navigation bar of the course website, or enter the following web address in your browser: http://www.uoguelph.ca/mapleta/login/login.do
Please review the Maple TA Syntax and Maple TA Quick Reference which can be found in CourseLink. It is advised that you keep the syntax sheet handy when completing your Maple TA Assignments.
Within Maple TA you will find three types of assignments:
•   **Practice**: These assignments will be available in advance of the graded assignments and provide you with an opportunity to practice for the assignments, without being graded. Practice versions of Assignments will be open Sunday through Wednesday of each week. Then it will close and the Graded version will open. The practice assignments will be labelled in Maple TA as "Assignment 2 Practice", for example. For the practice assignments you have an unlimited number of attempts. These assignments will not count for marks.
•   **Graded**: These assignments are a required part of the assessment in this course and will count toward your final mark. Generally each graded Maple TA Assignment will be open from 5pm Wednesday to 5pm Sunday. (Note: Computer related problems are not valid reasons for extending the deadline of Maple TA assignments; it is your responsibility to begin each assignment well in advance of when it closes.)
•   **Review**: These assignments will be available after graded version has been completed and are provided to you as practice for the final exam. No marks are associated with these assignments.

COURSE CONTENT

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

    1. Basic arithmetic and algebra: Hoy, et al., Ch 1

    2. Sets, subsets, functions: Hoy, et al., Ch 2.1 - 2.4

    3. Continuity of functions of one variable with economic applications:
                                  Hoy, et al., Ch 4

Regular course material (more economic examples and applications):

    4. Sequences and limits:
        Hoy, et al., Ch 3

    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

    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

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

    12. Constrained optimization:
        Hoy, et al., Ch 13

    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