



### General Course Information

**Instructor:** Michael Batu  
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*Office Location* MacKinnon 706  
*Office Hours* Mondays and Wednesdays 4:00-6:00 pm or by appointment  
*Department* Economics and Finance

**TA's:** Esmond Lun (Maple TA contact) Mustafa Kuroglu  
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*Office Location* TBA TBA  
*Office Hours* TBA TBA  
*Department* Economics and Finance Economics and Finance

**Class Schedule:** Tuesdays – Thursdays  
7:00-8:20 PM  
ROZH 102

**Lab Schedules:** ECON\*2770\*0101 – Fridays 12:30-1:20 PM MCKN 238  
ECON\*2770\*0102 – Fridays 1:30-2:20 PM ROZH 107  
ECON\*2770\*0103 – Fridays 2:30-3:20 PM MCKN115

**Pre-requisites:** ECON\*1100, ECON\*1050, MATH\*1000 or MATH\*1080 or MATH\*1200

### 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.

### Indicative 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 |
| 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 13.1-13.2

## Course Assessment

			<b>Associated Learning Outcomes</b>	<b>Due Date/ location</b>
<b>Assessment 1:</b>	20%	Maple TA Assignments Best 10 of 11	See Learning Outcomes 1-5	Refer to Course Policies
<b>Assessment 2:</b>	40%	2 Midterms (20% each)	See Learning Outcomes 1-5	<b>Midterm 1:</b> October 16 (Thu), ROZH 102 7-9 PM <b>Midterm 2:</b> November 22 (Sat), MACN 105 4-6 PM December 11, 2014 2:30-4:30 PM Location: TBA
<b>Assessment 3:</b>	40%	Final Exam	See Learning Outcomes 1-5	
<b>Total</b>	<b>100%</b>			

## Teaching and Learning Practices

**Lectures** All assignments, midterms and finals will cover material covered in the lectures. It is imperative you have a complete set of notes. I do not post my class notes online and they will not be available on Courselink. I would like you to attend class.

**Labs** Weekly labs are additional to lectures intended to help with the content of the courses, and help you to further develop independent learning skills. Solutions to lab exercises will be explained to you by the TA and they will not be available on Courselink. I would like you to attend labs.

## Course Resources

### Required Texts:

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

\*Textbook can be purchased at the University of Guelph Bookstore or the Guelph Campus Co-op Bookstore.

### Maple TA:

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>. (If accessing Maple TA via the direct web link, make sure to bookmark the page in your web browser, so you can easily access it later).

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, so you may wish to print out the document or save the file to your hard drive for reference.

# Course Policies

## Maple TA Assignments

These are completed online and your marks are recorded automatically. Maple TA assignments are graded online and you will be able to see your marks and feedback. From time-to-time the marks for the Maple TA assignments will be uploaded to Courselink; however you can always access your marks in Maple TA.

Maple TA Assignments must be completed before the assignment closes. Requests for extensions will be considered only in extreme circumstances. Computer related problems are not valid reasons for an extension; it is your responsibility to begin each assignment well in advance of when it closes.

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 in the early part of the week. Then it will close and the Graded version will open. 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 for a few days. The graded assignments will be labelled in Maple TA as "Assignment 2B Graded", for example. Consult the table below for the specific open and close dates of each assignment.
- **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.

You must complete each assignment by the time listed on the **Schedule**, so plan ahead – do not leave your assignment to the last minute. Graded assignments in Maple TA will be called "Syntax Graded", "Assignment 1A Graded" "Assignment 1B Graded" and so on. Each assignment mark will be the best of up to 5 attempts; the assignments are algorithmically generated, so you will find that each attempt will be a different set of questions. The sum of the best of 5 attempts of the A and B assignment will be recorded as your assignment mark. These 10 marks along with the mark you get on the Syntax will constitute your 11 marks. The best 10 out of your 11 assignment marks will count for your final mark. Each is worth 2% giving a total of 20% for assignments.

## Maple TA Assignment Schedule

<b>Tentative Schedule of Dates</b>			
<b>All assignments close/open at 5:00 PM on the dates given</b>			
<i>Assignment Number</i>	<i>Practice Opens</i>	<i>Practice Closes and Graded Opens</i>	<i>Graded Closes and Review Opens</i>
Syntax	Sept 4	Sept 10	Sept 20
Assignment 1	Sept 4	Sept 10	Sept 20
Assignment 2	Sept 14	Sept 17	Sept 21
Assignment 3	Sept 21	Sept 24	Sept 28
Assignment 4	Sept 28	Oct 1	Oct 5
Assignment 5	Oct 5	Oct 8	Oct 12
Oct 13 and Oct 14 No Classes			
Assignment 6	Oct 19	Oct 22	Oct 26
Assignment 7	Oct 26	Oct 29	Nov 2
Assignment 8	Nov 2	Nov 5	Nov 9
Assignment 9	Nov 9	Nov 12	Nov 16
Assignment 10	Nov 16	Nov 19	Nov 23

**Missed Course Components.** I do not set make-up midterms. Any missed midterm for a valid personal reason given to me in writing will have the weight transferred to the final exam. Note that the two midterm examinations for this course fall on a Saturday and make sure you are available during those days.

# University Policies

## Academic Consideration

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for

Academic Consideration: <http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

## Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<https://www.uoguelph.ca/registrar/calendars/undergraduate/2014-2015/>

## Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email [csd@uoguelph.ca](mailto:csd@uoguelph.ca) or see the website: <http://www.csd.uoguelph.ca/csd/>

## Course Evaluation Information

Please refer to: <https://www.uoguelph.ca/economics/course-evaluation>

## Drop date

The last date to drop one-semester courses, without academic penalty, is October 31<sup>st</sup>, 2014. For regulations and procedures for Dropping Courses, see the Academic Calendar:

<https://www.uoguelph.ca/registrar/calendars/undergraduate/2014-2015/>

# Course Learning Outcomes

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:**

### **4) 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.

### **5) Economic Modelling**

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