

## **ECO463/ECO2510: Financial Market Microstructure**

Please note that the next 4 pages contain the syllabus for ECO463 (undergraduate students) and the last 4 pages contain the syllabus for ECO2510 (graduate students).

## ECO463: Financial Market Microstructure

<b>Class Location and Time</b>	UC 85, Wednesdays, 11am-1pm and 6pm-7pm Not all hours are used, detailed will be on the portal.
<b>Instructor</b>	Professor Katya Malinova
<b>Office Location</b>	GE 211
<b>Office Hours</b>	TBA
<b>Phone</b>	(416) 978 5283
<b>E-mail address</b>	katya.malinova@utoronto.ca
<b>Course Website</b>	Blackboard

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**Course Description and Objectives:** Security prices evolve through a large number of bilateral trades, performed by people that have specific, well-regulated and institutionalized roles. Market microstructure is the subfield of financial economics that studies the price formation process. Using the lens of theoretical economic models, this course reviews insights concerning the strategic trading behaviour of individual market participants, and models are brought market data. The course further studies how public and private information, market regulation, and trading arrangements, such as limit order books or dark pools, affect behavior. The nature of this course is *academic*.

**Prerequisites & Exclusions:** See the Academic Calendar. Prerequisites are strictly checked and enforced and must be completed before taking a course. By taking this course you acknowledge that you will be removed from the course at any time if you do not meet all requirements set by the Department of Economics.

**Textbook:** The course is based on *original research papers* of which I will present tuned-down versions in class. *The relevant papers will be listed on the slides, and thus your reading list will be updated throughout the term.* There is no single textbook for the course. For background reading on the empirical tools, I recommend Joel Hasbrouck: *Empirical Market Microstructure* (2007, Oxford University Press) (hereafter: JH); this book is a graduate level text, and the material in class will be taught at a lower level. For discussions on market liquidity and the theoretical trading models (which will be discussed in the course), I suggest *Market liquidity : theory, evidence, and policy* by Thierry Foucault, Marco Pagano, and Ailsa Roëll. A classic book is *Market microstructure theory* by Maureen O'Hara. Some of the institutional details are explained in Larry Harris: *Trading and Exchanges - Market Microstructure for Practitioners* (2004, Oxford University Press). However, market structure and research on market structure develop so rapidly that any text will be out of the by the time the ink is dry. Professor Hasbrouck has an excellent set of (as up-to-date as it gets) notes that outline trading procedures ("Securities Trading: Principles and Procedures", focusing on the U.S. markets). These are available on his website: <http://people.stern.nyu.edu/jhasbrou/TeachingMaterials/STPPms11d.pdf>.

## Assessment and Grade Composition

This is a research oriented course that heavily relies on class discussion. Thus students' class participation is imperative, silent consumption is not sufficient. The other major components are the final and three writing assignments.

Type	Length	Deadline	Weight
Final	3 hours	TBA	30%
Essay 1	2,000 words	week 5, Oct 12	15%
Essay 2	2,000 words	week 9, Nov 09	15%
Data project	3,000 words	week 12, Nov 30	30%
Class participation*			10%

\*Disclaimer: Class participation includes pre-prepared questions that are to be submitted 24 hours in advance of guest and grad student (ECO2510) presentations. Grad student presentations are to be submitted a week ahead, and the slides will be made available via portal at that time.

All assignments are mandatory. *Classroom attendance is expected – including guest lectures and/or graduate student presentations – and very highly recommended. Not everything that I say in class is on the slides.* All writing assignments are due on the day of the lecture, before the start of the class. For every day or part thereof that you miss the deadline, your grade for that piece will be lowered by 5%, until your assignment grade is 0 (i.e., you can get a negative grade on an assignment). For the *empirical* project two people are expected to work together. Both group members are responsible that the project write-up does not contain plagiarised components. There is no midterm exam.

**Basis for Grading of Writing Assignments and the Final Exam:** The final is cumulative in nature, three hours in duration, and may consist of true/false, multiple choice, short answer, and/or essay questions. Responses are graded based on accuracy. Non-programmable calculators and a formula sheet (details are below) are permitted during tests/exams. Tests/exams are based on the topics covered in class, assignments, discussions, and assigned readings. Students should be prepared to answer questions that are conceptual, quantitative and/or descriptive. Writing assignments will be graded for content and exposition. The best essay will be clear, well-written, correct and inspiring. Grades over 90% require original ideas.

**Practice Problems:** I will post past exams, but without solutions. You should consult me during my office hours if you have queries about the past exam questions. No other practice problems will be provided.

**Specifications for the Formula Sheet:** Your formula sheet must have the following format: one page, double-sided, hand-written (i.e., not type-set), not photocopied, letter-sized paper containing formulae or simple expressions, but not full paragraphs of text, derivations of formulae, or solutions to past questions. The purpose of the formula sheet is to remind you of formulae that you need for computations, and it should be the result of extensive studying.

**Appeals.** You must put your appeal in writing and you must justify in detail why you think that you deserve a higher mark. Incomplete requests will not be considered. Note that I will reconsider the assignment as a whole and an appeal may lead to a lower overall grade.

**Laptop, tablet, and smartphone policy.** You are discouraged from using laptops during class as the typing creates excessive noise. Furthermore, it is expected that students will use technology responsibly, with consideration for their fellow students and other members of the University community. Laptops and smartphones are not to be used during class for email, instant messaging, web browsing, or any other activity that is disruptive to other students, the instructor, or the classroom environment. Violation of this technology policy may lead to a prohibition on all electronic equipment use for all students to ensure a productive classroom environment for everyone.

**Email Communication.** *Please read this section of the course outline prior to contacting the instructor by email.* I will use Blackboard to send out messages and it is your responsibility that your account is set up to receive message from the UofT portal. Please be sensitive to the fact that it can take considerable time for the instructor to respond with the due care that each query deserves.

If you do need to send email, to help prevent your message from being labelled as spam, be sure you indicate ECO463 in the subject line, and be sure not to include attachments. I will reply to legitimate email inquiries from students within two working days. If you do not receive a reply within this period, resubmit your question(s) and/or call me (leave a message if necessary). I will not answer emails over the weekend (Friday 17:00 – Monday 10:00), and I will not answer emails in the last 36 hours before a test. Email is not a mechanism to receive private tutorials (especially prior to tests) or to explain material that was covered in lectures you missed.

**TA Support:** TA support for this course is very limited and thus there will be no TA office hours or review sessions.

**Official statement on academic integrity:** Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves.

Familiarize yourself with the University of Toronto's Code of Behaviour on Academic Matters. It is the rule book for academic behaviour at the U of T, and you are expected to know the rules. Potential offences include, but are not limited to:

1. In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Copying material word-for-word from a source (including lecture and study group notes) and not placing the words within quotation marks.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Including references to sources that you did not use.
- Obtaining or providing unauthorized assistance on any assignment including:
  - working in groups on assignments that are supposed to be individual work;
  - having someone rewrite or add material to your work while editing.
- Lending your work to a classmate who submits it as his/her own without your permission.

## 2. On tests and exams:

- Using or possessing any unauthorized aid, including a cell phone.
- Looking at someone else's answers
- Letting someone else look at your answers.
- Misrepresenting your identity.
- Submitting an altered test for re-grading.

## 3. Misrepresentation:

- Falsifying or altering any documentation required by the University, including doctors notes.
- Falsifying institutional documents or grades.

To remind you of these expectations, and help you avoid accidental offences, I will ask you to include a signed Academic Integrity Checklist with every assignment. If you do not include the statement, your work will not be graded.

The University of Toronto treats cases of academic misconduct very seriously. All suspected cases of academic dishonesty will be investigated following the procedures outlined in the Code. The consequences for academic misconduct can be severe, including a failure in the course and a notation on your transcript. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me. If you have questions about appropriate research and citation methods, seek out additional information from me, or from other available campus resources like the U of T Writing Website. If you are experiencing personal challenges that are having an impact on your academic work, please speak to me or seek the advice of your college registrar.

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## Preliminary and Tentative Course Structure

I will provide reasonably detailed slides for each topic, the chapters in JH are to be viewed as supplements/background reading. The slides will also list the original research papers that the presentation covers. Dealing with some of these topics will take more than one lecture.

Topic	Content	Material
1	Introduction and Overview of Markets and Market Structure	
2	Inventory cost models	
3	Asymmetric info models: Kyle & Glosten and Milgrom	
4	Limit order markets	
5	Empirical measurement of trading costs	
6	Maker-taker pricing	
7	Dark trading	
8	High frequency trading	
9	New trends and technologies (distributed ledger?)	

## ECO2510: Financial Market Microstructure

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Type	Length	Deadline	Weight
Final	3 hours	TBA	36%
Classroom Presentation	15 minutes	weeks 9-12	18%
Data project	3,000 words	week 12, Nov 30	36%
Class participation*			10%

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**Presentations:** Students are expected to work in groups of two, each talk should aim for 15 minutes and be prepared to answer students' questions. Presentations slides are to be submitted one week in advance.

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