

## **BUSFIN 4227/7224 Trading and Markets**

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**Instructor:** Professor Ingrid M. Werner

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**Office Hours:** By Appointment

**Meeting Time & Place:**

Tu/Th 9:35-10:55 SB 219

Tu/Th 11:10-12:30 SB 219

Tu/Th 3:55-5:15 SB 219

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### **Course Outline**

In this course, we describe how today's financial markets work; how governments and exchanges regulate them; and how traders create liquidity, volatility, informative prices, trading profits, and transaction costs. The course provides an overview of today's fragmented market for financial securities. On the equity trading side, we discuss major exchanges such as NYSE, Nasdaq OMX, and Euronext but also newer players such as BATS, ISE, and IXE and Dark Pools such as Credit Suisse's Cross Finder and Goldman Sach's Sigma X. We also discuss options and futures exchanges like the CBOE the CME, and ICE, electronic bond trading platforms such as eSpeed and Bondvision, and currency trading systems such as EBS and Reuters 3000.

We study different market structures: single price auctions, open outcry auctions, screen-based markets, and brokered markets. We study the role of different market participants: investors, brokers, dealers, arbitrageurs, retail traders, buy-side traders (institutions), day traders, and rogue traders. We also study different order types: limit orders, market orders, and stop orders; and trading strategies: program trading, basket trading, block trading, and short sales. Finally, we look at the dark side of securities trading: insider trading, front running, market manipulation, and bluffing.

### **Target Students**

This course is primarily targeted towards students thinking of a career in investment management, securities trading, or the brokerage industry. It is also an excellent course to take for students targeting a career as a financial advisor. However, the course will also be useful for students interested in finance more generally. In the course, we will show that market structure and regulation affect asset pricing, and hence the cost of capital for firms around the world. Students taking this course will most certainly get a "leg-up" on the competition for summer jobs and hopefully also permanent jobs in the securities industry.

## **Learning Goals**

There are three main goals for students in this course:

1. To develop a thorough understanding of how securities are traded around the world, how traders (retail and institutional) can minimize their costs of trading, and how market makers can optimally set prices and execute orders.
2. To understand the role of regulation, and how it impacts players in the securities industry.
3. To gain first-hand experience in trading simulated securities and making a market for simulated securities.

## **Prerequisites**

The course is offered in combined sections of KAIST, MBA, SMF, and UG students. KAIST students need instructors permission, SMF students must have taken their core finance class, and MBA students must have taken MBA 6221 and 6222 (or MBA 6223). UG students must have taken BUSFIN 3220. In addition, background in microeconomics is useful because the notions of supply, demand and economic equilibrium underlie just about every trading situation. Statistics comes in handy when we need to design strategies in situations involving risk or evaluate performance of existing markets.

## **Instructor**

Ingrid Werner is the Martin and Andrew Murrer Professor. She joined The Ohio State University in 1998. She has also taught at Stanford Business School, the Wharton School, University of Michigan Ross School of Business, Bocconi University, University of Bologna, University of Toronto's Rotman School of Management, and the Stockholm School of Economics. She has an MBA and an Economics Licentiate degree from the Stockholm School of Economics, and a MA and a PhD in Economics from the University of Rochester. Professor Werner does research primarily in international finance and market microstructure. She was the visiting research economist at the New York Stock Exchange in 1997, and the visiting academic fellow at the Nasdaq Stock Market in 2001-2002.

## **Workload Expectation**

The university and college expectation is that students spend two hours outside of class for every hour spent in class. Since this course meets 3 hours per week, you should expect to spend 6 hours per week outside of class on course-related work.

## Course Material

### Required Materials:

Class-notes and other required reading materials will be distributed via Carmen.

### Background Readings:

Examples of textbooks that you may want to consult include:

- *Market Liquidity*, 2013, Oxford University Press, by Thierry Foucault, Marco Pagano, and Ailsa Röell
- *Financial Markets and Trading*, 2011, Wiley, by Anatoly B. Schmidt.
- *The Microstructure of Financial Markets*, 2009, Cambridge University Press, by Frank de Jong and Barbara Rindi.
- *Equity Markets in Action*, 2004, Wiley, by Professor Robert A. Schwartz and Reto Francioni. The textbook is available for free as an ebook through the Ohio State University Library.
- *Trading & Exchanges: Market Microstructure for Practitioners*, 2002, Oxford University Press, by Larry Harris.

I refer to chapters in the Schmidt book below, but similar information can be found in the other textbooks listed above or online. Additional content will be in the slides.

## Evaluation Criteria

The final course grade will be allocated according to the following:

Assignments (individual)	20%
Classroom Contribution (individual)	10%
Trading Simulations (individual)	25%
Cases	
Grad: Case write-ups (group)	20%
UG: Quizzes (individual)	20%
Take Home Case Final (group)	25%

## Examination Policy

Missed examination elements can only be made-up in extreme cases (e.g., death of family member, personal hospitalization, etc.) with proper documentation (e.g., a physician's note, ER paperwork, obituary, etc.). Each decision of potentially allowing a make-up is made by the instructor on a case-by-case basis. Additionally, you **MUST** contact the instructor (werner.47@osu.edu) as soon as you know of a potential problem or conflict with an examination date. Alternative methods (e.g., oral exam, essay) of testing may be used for make-ups. If you are experiencing an extreme situation or emergency, please attempt to notify the instructor (werner.47@osu.edu) via email ASAP.

## Groups

Students should form study groups of 2-4 people the first week of class.

## **Assignments**

There are four individual assignments, but students may collaborate within their study groups on the answers. Each assignment is worth max 5 points. Late assignments (submitted after the class in which they are due) will automatically lose one (1) point.

## **Classroom Contributions**

A substantial portion of your grade (10%) will be based on class contributions, split between attendance (5%) and active participation (5%). Class participation can take many forms such as posing questions and making comments during lectures, answering questions, and participating in case discussions. A combination of cold-calling and soft-calling will be used to maximize participation. Each student will be given ample opportunity to contribute to the classroom discussion. I will monitor contributions daily, and will cold-call students who need encouragement to speak up in class.

## **Trading Simulations**

We will use several trading simulations in the course, and your simulation performance during the Trading competition accounts for 25% of your grade. The trading simulations are not simply graded on profits generated by each trader, but also on learning and on position risk management. The simulation software -- Rotman Interactive Trader (RIT) - - is based on a software package designed by the staff in the trading laboratory at the Rotman School, University of Toronto. Fisher College holds a site license to RIT software. Students are encouraged to practice using the RIT software throughout the course. More information about the simulations will be provided on the class Carmen web-page.

## **Cases**

There will be two cases assigned in the later part of the course. In preparation for the in-class case discussions, study questions are available on Carmen. Graduate students (KAIST, MBA, and SMF) are expected to write a 3 page summary of their group's findings which is due before class. UG students will instead be given an individual short quiz at the beginning of class that will check that the students have read the case. All students are expected to participate actively in the in-class case discussion.

## **Take-home Case Final**

Each group will be able to select from three different HBS cases, and will be asked to analyze their selected case in a max 5 page write-up. More information will be available on the Carmen course page.

*The Take-home Case Final is due before noon on Tuesday, February 26, 2019. Only electronic submissions will be accepted.*

## **Other Policies**

### **Attendance:**

Any student who fails to attend without giving prior notification to the instructor will be dis-enrolled after the third instructional day of the term, the first Friday of the term, or the second scheduled class meeting of the course, whichever occurs first.

If you are unable to attend a particular class, please notify the instructor of your absence *prior* to that class. Failure to notify the instructor of absences, or missing more than five (5) sessions during the course, might result in a failing grade. Note, I take attendance virtually every class.

Absence from the trading competition will not be excused, except for the most serious circumstances. Such circumstances must be validated in writing by an appropriately accredited professional (e.g., medical doctor).

### **Academic Conduct:**

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "academic misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, submitting the same or similar work for credit in more than one class, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If a student is suspected of, or reported to have committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to COAM. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

**Appeals:**

Grading errors should be corrected. Appeals must be in writing, within 1 week after the graded work is returned—not the date you first look at it. The appeal should include a description of the question(s) that need to be reexamined as well as an explanation of why the original grade was incorrect. In general, the entire document will be checked for grading errors, and correcting these could either raise or lower the overall score.

**Disability Services:**

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

**Waitlisted Students:**

Students who are waitlisted and seek to enroll must attend class through the first class session of the second week of the session. After that date, students who have not been added will not be enrolled and may not continue to attend the class. Waitlisted students should contact either the Fisher Undergraduate Program Office or the Department of Finance office if they have any questions regarding the waitlist process.

# Business Finance 4227/7224

## Week 1: Primitives and Market Structure

- 1/8 Topics:
- The Role of an Equity Market
  - Orders, Bids, Offers, Spreads
  - US Market Structure

Readings:

*Schmidt* Chapters 1 and 2.

SEC Concept Release on Equity Market Structure, Release No. 34-61358; File No. S7-02-10.

*Securities Trading: Front, Middle, and Back Office, HBS 9-110-070*

**1/10 Trading Simulation: Order Driven Markets**  
***LT3 - Dynamic Order Arrival***  
*Due: Study Groups*

## Week 2: Information and Prices

- 1/15 Topics:
- Call Auctions
  - Continuous Trading
  - From Information to Prices

*Due: Assignment 1*

**1/17 RIT Trading Simulation: Price Discovery**  
***PD0 - Market Equilibrium***  
***PD1 - IPO Pricing***  
***PD2 - Asymmetric Information***  
***PD3 - ETF Arbitrage Pricing***  
*Due: Assignment 2*

## Week 3: Intermediated Markets

- 1/22 Topics:
- Risk-Neutral Models
  - Models with Risk-Aversion
  - Empirical Market Microstructure
  - Kyle's Model
  - Glosten-Milgrom Model

Readings:

*Schmidt* Chapters 3, 4 and 5.

**1/24 RIT Trading Simulation: Sales and Trading**  
*LT1 – Trading as a Principal (Review)*  
*LT2 – Orders in Illiquid Markets*  
*Due: Assignment 3*

## **Week 4: Institutional Trading**

- 1/29 Topics:
- Best Execution
  - Order Submission Strategies
  - Trading Cost Analysis

Readings:

Bacidore J. and G. Sofianos, Large Order Execution Quality, *Goldman Sachs*.

Bacidore J. and G. Sofianos, Choosing The Best Execution Strategy, *Goldman Sachs*.

Rakhlin, D., and G. Sofianos, 2006, The Impact of an Increase in Volatility on Trading Costs, *The Journal of Trading*, Spring, 43-50.

Rakhlin, D., and G. Sofianos, 2006, The Choice of Execution Algorithm: VWAP or Shortfall, *The Journal of Trading*, Winter, 26-32.

Cai., T., and G. Sofianos, 2006, Multi-day Executions, *The Journal of Trading*, Summer, 25-33.

**1/31 RIT Trading Simulation: Sales and Trading**  
*LT3 – Dynamic Order Arrival*  
*LT4 – Microstructure Capstone Case*  
*Due: Assignment 4*

## **Week 5: Regulation**

2/5 **Insider Trading**

Readings:

*Note on Insider Trading Liability, HBS 9-305-029*

*Case: Martha Stewart (A), HBS Case 9-305-034.*

2/7 **Market Manipulation, Ponzi Schemes, and Rogue Traders**

Readings:

Madhavan, A., D.J. Leinweber, 2001, Three Hundred Years of Stock Market Manipulations, *The Journal of Investing*, Summer.

*Case: Societe Generale (A): The Jerome Kerviel Affair, HBS Case 110029.*

## Week 6: Trading Competition

**2/12 RIT Trading Simulation  
Competition- Part I**

**2/14 RIT Trading Simulation  
Competition – Part II**

## Week 7: Current Topics

2/19 *Class Re-scheduled for Friday, February 22<sup>nd</sup>.*

2/21 **Dark Pools, Algorithms, and High Frequency Trading**

Readings:

Buti, S., B. Rindi, and I.M. Werner, 2011, Diving into Dark Pools, Fisher College of Business working paper.

Abrokwah, K., and G. Sofianos, 2006, Accessing Displayed and Non-Displayed Liquidity, *The Journal of Trading*, Fall, 47-57.

Finger, R., High Frequency Trading: Is It a Dark Force Against Ordinary Human Traders and Investors? *Forbes*, September 30, 2013.

Henning, P. J., Possibly Unfair, but not Necessarily Fraudulent, DealBook, The New York Times, July 16, 2013.

Sofianos, G., 2007, Dark pools and algorithmic trading, Chapter 6 in *Algorithmic Trading Handbook*, 2<sup>nd</sup> edition, Goldman Sachs.

Stewart, J. B., Fair Play Measured in Slivers of a Second, *The New York Times*, July 12, 2013.

2/22 **Course Review and Take-home Case Final Q&A**

2/26 *Take-home Case Final due, electronic submission before noon.*