Financial Information Systems  
INFO-GB.3350  
Fall 2012

| Instructor       | Bernard S. Donefer  
|------------------|---------------------|
| Class Meetings   | Tuesday 6:00 – 9:00 pm  
|                  | Room KMC 4-120 *(Note room change).*  
| Email            | bdonefer@stern.nyu.edu  
| Course Website   | Blackboard  
| Office Hours     | Tuesday 4:30 – 5:30 KMC 8-171 or after class or by appointment  

Information Technology in Financial Markets

The financial services industry is being transformed by regulation, competition, consolidation, technology and globalization. These forces will be explored, focusing on how technology is both a driver of change as well as the vehicle for their implementation. The course focuses on payment products and financial markets, their key systems, how they evolved and where might they be going, algorithmic trading, market structure dark, liquidity and electronic markets. Straight through processing, risk management and industry consolidation and convergence will be viewed in light of current events. The course objective is to bring both the business practitioner and technologist closer together. Topics will be covered through a combination of lectures, readings, news, case studies and projects.

COURSE DESCRIPTION

The financial services industry is a leader in the use of information technology. Firms in banking, securities, investments, insurance and financial marketplaces are among the most information intensive and innovative users of technology. Annual expenses for technology and communications exceed several billion for each of the largest firms.

The course is made of four modules, describing industry practice and the underlying technology:

I. Description and background of the financial services industry  
   a. Initial public offering (IPO) – Google’s online Dutch auction

II. Payment Systems  
   a. Cash, checks, ATM’s  
   b. Credit, debit, smart, and stored value cards  
   c. Internet payments and security (PKI, SSL)

III. Financial Markets – Trading  
   a. Order management systems, Straight Through Processing, (STP) and FIX  
   b. Equities – NYSE  
   c. Equities – NASDAQ  
   d. ECN’s, ATS’s  
   e. Dark liquidity, TCA, direct market access, trading strategies  
   f. Algorithmic and high frequency trading – the “Flash Crash”  
   g. Foreign Exchange  
   h. Derivatives – futures and options
IV. Pre-Post Trading
   a. After the Trade -- clearance and settlement,
   b. Market data, messaging and trading system architecture (if we have time)

In each module we will look at the six key forces that drive the industry:

- Regulation
- Competition
- Consolidation
- Convergence
- Technology
- Globalization

Management must make decisions about their data resources, information infrastructure, decision support and the process automation, which are consistent with their firm’s business strategy in addressing these forces. Further, there are usually independent strategies for firm’s retail and institutional businesses and differences between the buy and sell sides.

The following are representative topics addressed:

- How information technology is facilitating electronic forms of payment, specifically through media such as “smart cards” and on the Internet. Is it secure?
- Have regulatory changes resulted in technology that increases liquidity, decreases spreads and trading costs? How does it impact profits?
- Does technology increase market transparency?
- How has the explosion in data from transaction processing systems and markets playing an increasingly important role in investment decision-making, customer management, and risk management?
- How do financial services organizations manage risk and what is needed from risk management systems?
- How are issues in managing information technology in financial services organizations viewed from the standpoint of responsiveness to business needs?

Industry speakers will be invited periodically. Their materials will be posted on the class web site.

**PREREQUISITES**

*You should have had at least one course in investments, equities, fixed income, etc. or equivalent experience. If you have any questions, please contact me.*

**TEACHING MATERIALS**

- Blackboard website for this course will contain lecture materials and late breaking news
- Readings will be posted on Blackboard at least a week early and should be read prior to class each class. They will be chosen based on current news and issues. *THERE IS NO TEXT BOOK for this course.*
- Students are encouraged to find current materials in the news or on the Internet for class discussion.
### GRADING

<table>
<thead>
<tr>
<th>Item</th>
<th>Grade</th>
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<tbody>
<tr>
<td>1st Quiz – Intro and Payment Systems</td>
<td>20%</td>
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<tr>
<td>2nd Quiz – Financial Markets</td>
<td>35%</td>
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<tr>
<td>3rd Quiz – Institutional Trading, After the Trade</td>
<td>35%</td>
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<tr>
<td>forex, futures, options</td>
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<tr>
<td>Class participation</td>
<td>10%</td>
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### CLASSROOM BEHAVIOUR

Rude and impolite behavior is disruptive. Therefore:

You must TURN OFF beepers, email PDA’s and cell phones BEFORE class. **If your phone rings, you will be asked to leave.** Further I reserve the right to reduce your final grade by reducing points normally awarded for class participation. If you are on-call for work or family, *place your device on vibrate and leave the room before taking the call.*

You may not use cell phones, PDA’s, (even for receiving text messages) or other ELECTRONIC DEVICES OF ANY KIND, including lap tops, during class meetings.

Arriving late interferes with other students' learning and is not acceptable. Subway delays and other problems are unavoidable on occasion, but it is each student's responsibility to plan carefully to arrive on time and well prepared. Repeated latecomers will be penalized.

Since it is an evening class, I will permit you to eat and drink during class, only if it does not interfere with the class. Therefore, noisy or odiferous foods are not permitted. It is your responsibility to keep the room clean and if trash is left in the class room I will be forced stop this practice.

As a mark of respect, I ask all men to remove their caps or hats while in class, unless worn for a religious reason.

This course has a “zero tolerance” policy on cheating and plagiarism. Any student who breaks academic rules in this course has violated the mutual trust on which teaching and learning are based and will not only receive a zero for that assignment, but will be excluded from taking any further quizzes or exams in this course, which is likely to result in a failing grade for the course. For serious infractions I will direct the case to the University’s Disciplinary Panel. Remember that giving improper help is as clearly a violation as taking it.
# Preliminary Class Schedule

All dates and guest speakers are subject to change.

Changes will be posted on Blackboard

<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Topics</th>
<th>Questions</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>October 2</td>
<td>Course Logistics</td>
<td>What’s this course about? How are the teaching materials organized? What is the grading policy? How should we communicate? What do financial firms do? How do firms earn money? What is an intermediary? What is the IPO process?</td>
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<tr>
<td>Week 2</td>
<td>October 9</td>
<td>Payment Systems I</td>
<td>What is the history and economics of various payment methods? Cash, debit cards, credit cards What factors drive the adoption of payment systems? What has the experience been with emerging payment systems, including “smart cards”? How are payments processed in the US?</td>
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<td>Week 3</td>
<td>October 16</td>
<td>Payment Systems II</td>
<td>Institutional high value payments via Fedwire, CHIPS and SWIFT. How do secure payment systems work? SSL Encryption. Does E-cash have a future? Paypal?</td>
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<td>Week 4</td>
<td>October 23</td>
<td>Introduction to Markets</td>
<td>How are securities traded? Are all markets similar? What are auction, dealer and matching market systems? How do they differ? How do markets compete? What defines execution quality? How is technology impacting their trading? What functions are needed by an institutional order management system? What technologies, communications, messaging standards are used for implementation? How are securities firms connected to clients, marketplaces and settlement processing?</td>
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<td>Week 5</td>
<td>October 30</td>
<td>First Quiz on Weeks 1-3</td>
<td>How the NYSE worked with specialists and floor brokers. What were seats? Why NASDAQ was created and how it worked with competing market makers. What are the pink sheets and bulletin board markets?</td>
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<td>Break</td>
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<td>No break this semester</td>
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<td>Week 6</td>
<td>November 6</td>
<td>Quiz returned/reviewed After the Regs NYSE</td>
<td>Reg ATS and creation of ECN’s. Decimalization. Reg NMS. New order types. Maker taker model. The NYSE group. The designated market make (DMM)</td>
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<td>Week 7</td>
<td>November 13</td>
<td>Guest Speaker After the Regs NASDAQ</td>
<td>TBA Direct market access. SOES bandits. Open close issue. Price time priority. Becoming an ECN to become an exchange.</td>
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<td>Week 9</td>
<td>November 27</td>
<td>Second Quiz Weeks 5-7 Institutional Trading II</td>
<td>Dark pools, Alternative Trading Systems (ATSs), Posit, Liquidnet, Pipeline. Alpha seeking (quant), market making, high frequency trading (HFT) models.</td>
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<td>Week 10</td>
<td>December 4</td>
<td>Return and Review Quiz After the Trade</td>
<td>How are trades cleared and settled? What does a prime broker do?</td>
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<td>Week 11</td>
<td>December 11</td>
<td>Forex, Futures</td>
<td>How is foreign exchange traded? What is the difference between forwards and futures? How are they valued, traded?</td>
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<tr>
<td>Week 12</td>
<td>December 18</td>
<td>Options Review for final 3rd Quiz Online</td>
<td>What are options? How are they valued and traded?</td>
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