

IT in Financial Markets

CIS 9555

Sample Syllabus

Instructor	Prof. Bernard S. Donefer
Class times	Monday and Wednesday 6:00 – 7:15
Email	bernard_donefer@baruch.cuny.edu
Website	Blackboard and http://cisnet.baruch.cuny.edu/donefer/
Office Hours	Available Pre and Post Class and by Appointment at the Subotnick Center

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. 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 can exceed \$2 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
- 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. Algorithmic trading, dark liquidity, TCA, direct market access, trading strategies
 - f. Foreign Exchange
 - g. Derivatives -- futures, options and SWAPS

- IV. Pre-Post Trading
 - a. After the Trade -- clearance and settlement,
 - b. Risk Management
 - c. Market data, messaging and system architecture

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:

- o How information technology is facilitating electronic forms of payment, specifically through media such as "smart cards" and on the Internet. Is it secure?
- o Have regulatory changes resulted in technology that increases liquidity, decreases spreads and trading costs? How does it impact profits?
- o Does technology increase market transparency?
- o 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?
- o How do financial services organizations manage risk and what is needed from risk management systems?
- o 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

- o Blackboard website for this course will contain lecture materials and late breaking news
- o Readings will be posted on Blackboard at least a Topic early and should be read prior to class each class. Readings may be replaced as new materials become available. **THERE IS NO TEXT BOOK** for this course.
- o Students are encouraged to find current materials in the news or on the Internet for class discussion.

TEAM PROJECTS

There will be team projects assigned to groups of four students. Detailed information will be provided during the second Topic of class.

GRADING

Item	Grade
First Quiz – Intro and Payment Systems	15%
Midterm – Financial Markets	30%
Final	25%
Individual and Team Projects	25%
<i>Class participation</i>	5%

Late work will be marked lower. *Assignments cannot be accepted after the class discussion.*

All students must sign up and take the Reuters I and II class in the Subotnik Center before end of September.

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.

There is NO EATING OR DRINKING permitted in the Subotnick Center..

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.

Class Schedule

All dates subject to change. Any changes will be posted on Blackboard

Topic 1 The Course Aug 27	Questions	Readings and Assignments
Logistics of this course.	What's this course about? How are the teaching materials organized? What is the grading policy? How should we communicate?	Edgar homework assignment given
Topic 1 Introduction Aug 27 and Sept 3	Questions	Readings and Assignments
Introduction to the financial services industry. Principal functions of financial systems. The eroding distinctions between banking, insurance, securities. Industry economics	What do financial firms do? What is an intermediary? How are they related? What is the IPO process? How do firms earn money?	
Topic 2-3 Payment Systems Sept 8, 10, 15, 17	Questions	Readings and Assignments
Payment systems: cash, checks, credit and debit cards, smart cards, (EZ Pass, Octopus), stored value cards, (Metro card), PayPal How does the US experience in smart card use compare to international experiences? Internet security Encryption techniques, security and privacy: PKI, SHTTP, SSL, SET e-Digital Signature Act of 2000 How do banks move funds internationally and domestically?	What is the history and economics of various payment methods? What factors drive the adoption of payment systems? How are payments processed in the US? How do secure payment systems work? What has the experience been with emerging payment systems, including "smart cards"? What payment methods are unique to the Internet? Does E-cash has a future?	<u>US Credit Card Use</u> WSJ <u>Visa/MC Primer</u> Lehman Bros. Research <u>U.S. Consumers and Electronic Banking, 1995–2003</u> Federal Reserve Bulletin, Winter 2004 (Scan) <u>Introduction to Cryptography</u> RSA <u>CHIPS Brochure</u> CHIPS <u>Message Standards evolution in the Securities Industry: from paper-based to XML communications</u>
Topic 4		
Quiz on Topics 1-3 Sept 22	Study outline previously posted	

Topic 4 Introduction to Markets Sept 24, Oct 6	Questions	Readings and Assignments
<p><i>Return and review of Quiz</i></p> <p>Introduction to Financial Markets - Equity Markets</p> <p>The trading function – institutional vs. retail</p> <p>Impact to markets of regulatory changes</p> <p>Alternative market structures</p>	<p>How are equities traded? Are all markets similar? What are auction, dealer and matching market systems? How do they differ?</p> <p>How do markets compete? What defines execution quality? How is technology impacting their trading?</p>	<p><u>The Structure and Performance of Securities Markets</u>, Ritter, Silber and Udell</p> <p><u>Market Mechanics</u> NASDAQ</p>
Topic 5 OMS, STP and FIX Oct 14 (TUES), 15	Questions	Readings and Assignments
<p>Order Management Systems (OMS) – retail and institutional examples</p> <p>STP and FIX</p>	<p>What functions are needed by an institutional order management system? What technologies are used for implementation?</p> <p>How are securities firms connected to clients, marketplaces and settlement processing?</p>	<p><u>North American FIX Survey</u> Tower Group</p> <p><u>Equity OMS for Broker Dealers</u> Tower</p>
Topic 6 NYSE Oct 20, 22	Questions	Readings and Assignments
<p>Systems and people on the NYSE</p> <p>NYSE systems and operations, DOT, BBSS</p> <p>Rule NMS and its impact</p> <p>The NYSE – Archipelago merger</p>	<p>How are trades completed on the NYSE? What systems technology does the NYSE use?</p> <p>How “good” is the NYSE? Impact of new regs and merger</p>	<p><u>The Trading Floor</u>, NYSE</p> <p>New timely readings to be posted - check Blackboard</p>
Topic 7 NYSE Oct 27	Questions	Readings and Assignments
Guest Speaker	NYSE Specialist	
Topic 8 NASDAQ Oct 29, Nov 3	Questions	Readings and Assignments
<p>Systems and people on NASDAQ</p> <p>Market makers, SOES, ACT, SuperMontage, et al.</p> <p>Electronic communication networks (ECNs) – What service do they provide? How much value do they had?</p> <p>NASDAQ-Instinet merger and BRUT acquisition.</p> <p>Impact of rule NMS</p>	<p>How are trades completed on the NASDAQ market?</p> <p>What does a market maker do?</p> <p>How “good” is NASDAQ?</p> <p>How have ECNs transformed trading?</p> <p>Why the mergers? What has changed?</p>	

Topic 9 ATS's, ECN's and Algorithmic Trading Nov 5	Questions	Readings and Assignments
The new buy-side trading paradigm – DMA direct market access - Lava, etc. ATS's Liquidnet and Pipeline Algorithmic and program trading	Have buy side traders taken over from brokers? Have quants taken over? What technology moved to the money managers and what is the impact? How do new technology-based markets compete with existing exchanges?	<u>The Broken Marketplace— Reversing a \$100 Billion Tax II</u> <u>Battle of the Black Boxes II</u> <u>Institutional Equity Trading in America</u> Tabb
Topic 10 Nov 10	Questions	Readings and Assignments
Guest speaker	NASDAQ market maker	
Topic 11 Nov 12	Questions	Readings and Assignments
Midterm Nov 12	Study outline previously posted	
Topic 12 MT review and Forex and Derivatives Nov 17, 19, 26	Questions	Readings and Assignments
Midterm returned and reviewed. Forwards, futures, Options, Commodities and Foreign Exchange Trading	What is the difference between forwards, futures, options and swaps? How is foreign exchange traded? How are they valued?	<u>Big Mac Currencies</u> The Economist <u>Introduction to Options and Futures IFM</u> <i>Optional</i> Web based information: www.cboe.com/LearnCenter/cboeeducation/course_01_01/mod_01_01.html www.futures.tradingcharts.com/tafm
Topic 13 After the Trade Dec 1	Questions	Readings and Assignments
Clearing and Settlement OMGEO	How do clearing and settlement work in equities securities processing? Are we prepared for T+1 settlement? What are the cross border issues?	
Topic 14 Risk Management Dec 8-10	Questions	Readings and Assignments
Risk Management Systems – VaR, RAROC Demonstration of a risk management system	What is risk management? What kinds of risk can be effectively managed and how? How are risk measures calculated? How stakeholders deal with risk management and in what form?	<u>Risk Management a Practical Guide</u> RiskMetrics Ch 1& 2

Topic 15 Messaging and Market Data Dec 15	Questions	Readings and Assignments
Market data Messaging - broadcast, multi-cast, guaranteed delivery, pub/sub, content based addressing, etc. New hi speed trading room architecture Review for Final Exam	What are the issues associated with market data and messaging? How are trading rooms and trading systems architected? Impact of regulations on trading system design?	
Final Exam Dec 17th	Study outline previously posted	