FNCE 885
FinTech: Business, Finance and Technology

SHIMON KOGAN, PHD
ASSOCIATE PROFESSOR OF FINANCE
WHARTON AND MIT SLOAN (VISITING FACULTY) & IDC HERZLIYA (PERMANENT FACULTY)

Contact
Office 2423 SH-DH
Email skogan@upenn.edu

Overview

Technology is playing an increasingly dominant role in the financial service industry. It is changing how existing players operate and it is creating new ways to deliver core services like saving, investing, borrowing, and insuring. The course provides an overview of the most significant technological advances that are radically changing the industry, focusing on AI and Blockchain. We will analyze how these technologies create value in the financial industry by lowering frictions — from unit processing cost, through asymmetric information and network effects.

The course will integrate a strategic discussion of the competitive landscape and the market opportunities for new entrants, with an in-depth understanding of the technologies and their applications. We will do so by focusing on three areas in which these technologies are driving change: (I) Lending, (II) Clearing (III) Trading. In each of these areas, we will cover examples and developments from (1) marketplace lending, (2) blockchain and distributed ledgers, (3) quantitative investing and its use of non-standard data and analytics. In each of these areas, we start by analyzing the marketplace, the incumbents, and the strategies of the incoming technology-based new entrants. We then proceed to understand the relevant technological applications in each area using real-world data.

Requirements

To understand how technology is being used in these applications, we will apply a variety of tools to real world examples and data. Programming knowledge is not a prerequisite but a desire to acquire that skill is. We will be using R, a robust open-source programming language for that. To make the best of out of the course, students are advised to acquire some basic R skills from online resources, supplied materials, and optional review sessions. More advanced application will be articulated through examples in class.

Course Structure

The course mixes standard lecture, examples, cases, and guest lectures. Student are expected to work in teams and demonstrate a high level of independent learning and initiative. The course' goal is to provide students with in-depth understanding of how to integrate these technologies/analytics into new business ideas and help them be effective managers in an environment where these technologies are strategic to the organization.

Materials

You will need to purchase the HBS Cases material (available online), individually or as a group. Additional reading materials will be distributed on Canvas. I will make hard copies of the slides available at the beginning of class.

Grades

Grades will be determined based on:

(I) **Class Participation — 30%**

The course is heavily predicted on in-class discussion. Thus, you are expected to attend all

sessions and take an active role in class.[1] To obtain maximal class participation grade, you are expected to (1) participate in a way that promotes collective learning, and (2) be prepared to discuss and share your analysis/insights about the assigned readings.

(II) **Cases — 15%**

Everyone needs to prepare for the in-class discussion of all the cases. You are expected to submit an in-depth analysis of at least two of the four cases discussed in the course in groups of 3-4 students. The analysis should not exceed 3 pages each. If you submit reports for more than two cases, your top two case reports' grades will be considered.

(III) **Group Assignments — [0% - 15%]**

The **optional** group assignments give you an opportunity to apply the tools we discuss to real-world applications and data. Each assignment corresponds to a main course module. You can work in groups of up to 3-4 students each. Any points you accumulate via the assignments will be credited toward the weight of the final exam. For example, imagine that you submit two of the three assignments and you receive full credit for both. Your final exam weight will be reduced by 10% and you receive a max score for 10% of the course grade.

(IV) **Final Exam — [40% - 55%]**

The exam will take place in class during our last session, 3/5/2020. Please note the scheduling of the exam. You are responsible for ensuring that you are available and on campus to take the exam as no make-up exam will be offered. The weight of the exam will vary based on the number of group assignments you submit, and your grade on these assignments (see part III).

[1] Up to two absences are excused. More than six absences will automatically result in a failure grade.

Preliminary Meetings' Outline[2]

Class	Date	Topic	Case / Data	Due Dates
Overview				
1	1/16/20	What is FinTech?		
2	1/21/20	Regulatory approach to FinTech and the role of BigTech	• Case: "FinTech and Finance Transformation: the Rise of Ant Financial Services" (NUT-144)	Case I Due (in class)
Lending				
3	1/23/20	Household lending market Modeling defaults	• Lending Club loan-level data	
4	1/28/20	Loan data visualization Market place lending	• Case: "Lending Club" (E-597)	Case II Due (in class)
5	1/30/20	Machine learning in lending: Random Forest MPL from investors' perspective		
Clearing				
6	2/4/20	Blockchain overview Blockchain-relevant cryptography		Assignment I Due @8PM
7	2/6/20	Blockchain — networks and incentives		
8	2/11/20	Blockchain — applications	• Case: "R3: Putting the 'Fin' Back in FinTech" (IN1544)	Case III Due (in class)
9	2/13/20	*Guest speaker*		

[2] In addition, an optional recitation session with examples on data manipulation and analytics examples will be held during the first two weeks of the course.

Class	Date	Topic	Case / Data	Due Dates
Trading				
10	2/18/20	A new age of quantitative trading		Assignment II Due @8PM
11	2/20/20	Machine Learning in trading: Lasso and Ridge	• US Industry Equity Returns	
12	2/25/20	Crowdsourced trading	• Case: "Quantopian: a New Model for Active Management" (9-218-046)	Case IV Due in class
13	2/27/20	*Guest speaker*		
Wrap-up				
14	3/3/20	Course wrap-up: Big picture impact of FinTech		Assignment III Due @8PM
15	3/5/20	*Final Exam*		