

# **FNCE 885/385 FinTech: Business, Data, and Analytics**

**SHIMON KOGAN, PHD**  
**ASSOCIATE PROFESSOR OF FINANCE**  
**MIT SLOAN & IDC HERZLIYA**

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## 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 transacting. 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 high-level 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 trading 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.

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## 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 tools, supplied materials, and optional review sessions. More advanced application will be articulated through examples in class.

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## Course Structure

The course mixes standard lecture, a number of examples and cases, and guest lectures. Students are expected to work in teams and demonstrate a high level of independent learning and initiative. The course's 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.

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## 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.

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## Grades

Grades will be determined based on:

(I) **Class participation — 15%**

You are expected to attend all sessions and take an active role in class.

(II) **Cases — 30%**

You will be asked to submit your analysis of three of the four cases discussed in the course, while working in groups of 3-4 students. The analysis should be in a form of annotated slides (in PowerPoint and Keynote format), no more than 6 slides each. Groups should also be prepared to present their analysis in class. For each case, a subset of groups will be drawn at random — with replacement — and will be asked to present in class.

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

The **optional** group assignments give you an opportunity to apply the tools we discuss real-world applications. Each assignment corresponds to a main course module. You can work in groups of up to 3-4 students each. Any points you accumulate will be credited against the weight of the final exam. For example, imagine that you submit two of the three assignments and you get full credit for the them. Your final exam weight will be reduced by 10% (equivalently, you received 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, 3/1/2018. 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).

Preliminary Meetings' Outline<sup>1</sup>

Class	Date	Topic	Case / Papers / Data	Due Dates
<b>Overview</b>				
<b>1</b>	1/11/18	What is FinTech?	<ul style="list-style-type: none"> <li>JP Morgan Chase Letter to Shareholders</li> <li>Has the US Finance Industry Become Less Efficient?</li> </ul>	
<b>2</b>	1/16/18	The past and present of FinTech	<ul style="list-style-type: none"> <li>Case: Cutting Through the Fog</li> </ul>	Case I Due @8AM
<b>Lending</b>				
<b>3</b>	1/18/18	Market place lending LendingClub: business model Loan data visualization	<ul style="list-style-type: none"> <li>Case: Lending Club (A)</li> <li>Case: Lending Club (B)</li> </ul>	Case II Due @8AM
<b>4</b>	1/23/18	Understanding credit models Introduction to Machine Learning	<ul style="list-style-type: none"> <li>Lending Club loan-level data</li> </ul>	
<b>5</b>	1/25/18	Random Forest applied to LC data MPL from investors' perspective		
<b>Clearing</b>				
<b>6</b>	1/30/18	Cryptography		Assignment I Due @8PM
<b>7</b>	2/1/18	Blockchain — network and incentives		
<b>8</b>	2/6/18	Blockchain — finance applications	<ul style="list-style-type: none"> <li>Case: Deutsche Bank (A)</li> <li>Case: Deutsche Bank (B)</li> </ul>	Case III Due @8AM
<b>9</b>	2/8/18	<i>Guest speaker</i>		

<sup>1</sup> 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 / Papers / Data	Due Dates
<b>Trading</b>				
<b>10</b>	2/13/18	A new age of quantitative trading		Assignment II Due @8PM
<b>11</b>	2/15/18	Crowdsourced trading	• Case: Quantopian	Case IV Due @8AM
<b>12</b>	2/20/18	Machine Learning in trading		
<b>13</b>	2/22/18	<i>Guest speaker</i>		
<b>14</b>	2/27/18	Unstructured data and Natural Language Processing		
<b>Wrap-up</b>				
<b>15</b>	3/1/18	<i>Final Exam</i>		Assignment III Due @8AM