

University of Pennsylvania - The Wharton School
 Professor Deniz Selman (denizs@econ.upenn.edu)
 Professor Olivia S. Mitchell (mitchelo@wharton.upenn.edu)
Fall 2019 Syllabus

BEPP 305/805: Risk Management

The last financial crisis and subsequent recession provide ample evidence that failure to properly manage risk can result in disaster. Individuals and firms confront risk in nearly all decisions they make. People face uncertainty in their choice of careers, their spending and saving decisions, family choices, and many other facets of life. Similarly, the value that firms create by designing and marketing good products is at risk from a variety of sources. The bankruptcy of a key supplier, a sharp rise in the cost of financing, the destruction of an important asset, the impact of global warming, or a liability suit can quickly squander the value created by firms. In extreme cases, risky outcomes can bankrupt a firm, as has happened recently to manufacturers of automobile parts and a variety of financial service firms. The events since the Global Financial Crisis also offer stark reminders that risk can impose significant costs on individuals, firms, governments, and society as a whole.

This course explores how individuals and firms assess and evaluate risk, examines the tools available to successfully manage risk, and discusses real-world phenomena that limit the desired amount of risk-sharing. Our focus is primarily on explaining the products and institutions that will serve you better when making decisions in your future careers and lives.

Course Structure and Requirements. The course is organized around two modular sections. The first module introduces the concept of risk, explores different measures of risk, presents the theory of optimal decision-making under uncertainty, and illustrates how asymmetric information and psychological considerations affect risk management. The second module touches on behavioral models, and then goes on to examine when firms do and do not have a motivation to manage risk. We also investigate the role of the legal system in corporate risk management.

At the end of each module, there will be a midterm exam covering the material from that module. There is no final exam. Final grades are determined by two midterm exams (90%) and exercises (10%); see below for additional information.

Faculty: You may schedule meeting times with the professors via email.

Prof. Deniz Selman: denizs@econ.upenn.edu

Prof. Olivia Mitchell: mitchelo@wharton.upenn.edu

Classrooms:

BEPP 305/805-401	MW 9:00-10:30 am	JMHH F45
BEPP 305/805-402	MW 1:30-3:00 pm	SHDH 1201

Undergrad TA

Tom Yuz: tomyuz@wharton.upenn.edu

Office Hours TBA.

Grad TA

Betty Wang: xiao3@wharton.upenn.edu

Prerequisites. There are no formal prerequisites for the class but students are assumed to have an introductory knowledge of statistics, microeconomics, and finance, at the level of the Wharton undergraduate classes STAT 101, BEPP 250, and FNCE 100.

Course grades. Final grades for the course are determined by midterm exams and exercises. The *equally-weighted* average of the **two midterm exams** is worth 90% of the final grade. The remaining 10% is determined by the grades on **homework exercises and survey responses** turned in by the appropriate deadline. Problems may be worked with other class members but each student must submit his/her own homework to the professor. We will drop one homework with the lowest score.

Add/Drop Deadline. As per Wharton policy, you may drop the course until October 7, 2019. After the drop deadline, you need written permission from an instructor to drop the course. It is the policy of the course instructors that we do not sign petitions to drop the course after the official drop date. Please refer to the following link for more information:

<https://undergrad-inside.wharton.upenn.edu/withdrawing/>

Withdrawal Deadline. As per UPenn policy, the formal withdrawal deadline is November 8, 2019. And as per UPenn policy, after the 10th week of the semester, withdrawals are not normally permitted.

Expectations. Students must become familiar with and adhere to the Penn Code of Academic Integrity and Code of Student Conduct (<https://catalog.upenn.edu/pennbook/code-of-academic-integrity/>) Class attendance and punctuality are expected. Students are asked **to use laptop computers exclusively for taking notes; other uses for electronic devices during class are prohibited.**

Course Electronic Device Policy. Experience has shown that use of the use of electronic devices during any class for non-educational purposes significantly disrupts learning for the students using the device and for others in the class. Accordingly, the following policies should be observed with penalties set by the instructor as deemed appropriate:

- Phones must be turned off and put away. If a student must keep a phone on by reason of a personal emergency, the student must inform the instructor before class begins.
- The use of laptops and tablets is not allowed unless for educational purposes as permitted by the instructor (e.g., note taking, reading, or data analysis).

Course Material. Lecture notes, readings, case studies, problem sets, and surveys will be posted on the course Canvas. Students are responsible for checking this site regularly for updates. Go to <https://canvas.upenn.edu/>.

Exam Regrades. To submit a regrade request for an exam, you must submit your original test answers, a signed regrade affidavit (see the course Canvas for the template), and a written memorandum explaining why you think that the exam should be regraded. This request must be submitted within 5 business days after the graded examination papers have been made available for pickup. *Your entire exam will then be reviewed, and your grade may go down, go up, or remain unchanged at the prerogative of the professor for the module.* You must not mark, make

notes on, or alter the exam papers for which you seek a regrade; any such alteration will be seen as a violation of the Code of Academic Integrity and you will receive an automatic failing grade for the course.

Missing an Exam. Students may miss scheduled examinations only with a University-approved excuse. Examples of such valid excuses include direct conflicts with another course offered at Penn that cannot be rescheduled as well as a varsity (but not club) sport competition (but not training). In particular, *job interviews and vacations are not a legitimate reason to miss an exam.* Missing an exam without a University-approved excuse will result in a zero for the exam. Arriving late to an exam will be treated as missing an exam.

Midterm Exam Dates: Put these on your calendar now! (rooms TBA)

Module #1:

Review Session: Tuesday, Oct. 15, 2019, 6:00-7:20 pm

Exam: Wednesday Oct. 16, 2019, 6:00-7:20 pm

Module #2:

Review Session: Wednesday Dec. 4, 2019, 6:00-7:20 pm

Exam: Monday Dec. 9, 2019, 6:00-7:20 pm

BEPP 305/805: Risk Management

Module 1. The Theory of Risk and Market Failures (Selman)

The first module introduces students to risk and its measurement, and investigates barriers to risk management. We discuss what risk means, how it is measured, and how insurance can allow offloading of risk and reducing potential insolvencies. Next we analyze optimal decision-making under risk as well as barriers to risk management. This includes the investigation of incentive problems that arise because of asymmetric information, under the themes of “moral hazard” and “adverse selection.” We will use a variety of real world examples to illustrate the ideas.

1	Wednesday	8/28/19	Introduction and Overview of Probability
NC	Monday	9/2/19	<i>Labor Day</i>
2	Wednesday	9/4/19	Value at Risk
3	Monday	9/9/19	Law of Large Numbers
4	Wednesday	9/11/19	Risk Pooling and Central Limit Theorem
5	Monday	9/16/19	Expected Utility Theory (1)
6	Wednesday	9/18/19	Expected Utility Theory (2) <i>Assignment #1 Due (5 pm)</i>
7	Monday	9/23/19	Expected Utility Theory (3)
8	Wednesday	9/25/19	Precautionary Saving
9	Monday	9/30/19	Subjective Beliefs
10	Wednesday	10/2/19	Adverse Selection (Lemons Problem)
11	Monday	10/7/19	Adverse Selection (Lemons Problem)
12	Wednesday	10/9/19	Moral Hazard (Principal-Agent Problem) <i>Assignment #2 Due (5 pm)</i>
13	Monday	10/14/19	Moral Hazard (Principal-Agent Problem)
	Tuesday	10/15/19	Evening Review Session (6:00-7:20 pm)
NC	Wednesday	10/16/19	Midterm Exam Module 1 (6:00-7:20 pm)

Module 2. Behavioral Economics and Corporate Risk Management (Mitchell)

We begin by studying mistakes that often arise when making decisions involving risk, and we focus on the market implications of these errors. Next we analyze how firms seek to manage their risks, identifying why and when risk is a problem and when it is not. We show that risk not only increases the possibility of future bankruptcy costs, but it also causes conflicts between the various stakeholders which can result in dysfunctional decision-making. Additionally, risk can raise financing costs and lead to the sacrifice of otherwise profitable investment opportunities. Next, we show how risk management decisions may be made by managers to further their own welfare, rather than that of owners, and which stakeholders this can harm. We close with an assessment of the legal duties of directors and officers and liabilities toward customers and other parties.

14	Monday	10/21/19	Departures from Expected Utility
15	Wednesday	10/23/19	Behavioral Economics
16	Monday	10/29/19	Introduction to Enterprise Risk Management
17	Wednesday	10/28/19	Corporate risk management and firm value <i>Assignment #1 due (5 pm ET)</i>
18	Monday	11/4/19	Limited Liability & Real Options
19	Wednesday	11/6/19	BP Case Study
20	Monday	11/11/19	Why Corporations Manage Risk (A) <i>Assignment #2 due (5 pm ET)</i>
21	Wednesday	11/13/19	Why Corporations Manage Risk (B)
22	Monday	11/18/19	Corporate Legal Liabilities
23	Wednesday	11/20/19	Corporate Risk Management Strategies
24	Monday	11/25/19	Mortality Risk Wags the Enterprise Dog
NC	Wednesday	11/27/19	<i>Thanksgiving Break</i>
25	Monday	12/2/19	Risk Management and Leadership
	Wednesday	12/4/19	Review Session (6:00-7:20 pm)
	Monday	12/9/19	Midterm Exam Module 2 (6:00-7:20 pm)