University of Pennsylvania - The Wharton School
Professor Neil Doherty (doherty@wharton.upenn.edu)
Professor Olivia S. Mitchell (mitchelo@wharton.upenn.edu)
Fall 2017 (Draft) 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 the two midterm exams (90%) and exercises (10%); see below for additional information.

Faculty
Prof. Neil Doherty: doherty@wharton.upenn.edu
Prof. Olivia Mitchell: mitchelo@wharton.upenn.edu
You may schedule meeting times with the professors via email

Classrooms :

M-W 9-10:30 am	BEPP 305/805- 401	Room JMHH 255
M-W 1:30-3:00 pm	BEPP 305/805 – 402	Room JMHH G55

TAs and Office Hours

Emily Fisher	emfi@wharton.upenn.edu	Room JMHH XX xxxxxx x – x:xx PM
Matthew Goodman	goodma@wharton.upenn.edu	Room JMHH F94 Tuesday 12 – 1:30 PM

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 10, 2017. 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 October 9, 2017. 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 (https://provost.upenn.edu/policies/pennbook/2013/02/13/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., notetaking, 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://wharton.instructure.com

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!

#1:
Review Session: Monday, Oct. 16, 2017, 6-7:30 pm (SHDH 1206)
Exam: Wednesday Oct. 18, 2017, 6-7:20 pm (to be announced in October)

#2:
Review Session: Monday Dec. 4, 2017, 6-7:30 pm (SHDH 1206)
Exam: Wednesday Dec. 6, 2017, 6-7:20 pm (to be announced in late November)

BEPP 305/805: Risk Management
Module 1. The Theory of Risk and Market Failures (Doherty)

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.

Topic	Day	Date	Subject
Module 1			
1	Wednesday	Aug. 30, 2017	Overview of Probability
NC	Monday	Sept. 4, 2017	*Labor Day*
2	Wednesday	Sept. 6, 2017	Law of Large Numbers and Risk Pooling
3	Monday	Sept. 11, 2017	Central Limit Theorem and Value at Risk
4	Wednesday	Sept. 13, 2017	Expected Utility Theory (1)
5	Monday	Sept. 18, 2017	Expected Utility Theory (2)
6	Wednesday	Sept. 20, 2017	Expected Utility Theory (3)
7	Monday	Sept. 25, 2017	Precautionary Saving
8	Wednesday	Sept. 27, 2017	Principal-Agent Relationships
9	Monday	Oct. 2, 2017	In-Class Game
10	Wednesday	Oct. 4, 2017	Adverse Selection (Lemons Problem)
11	Monday	Oct. 9, 2017	Adverse Selection (Screening) and Reclassification Risk
12	Wednesday	Oct. 11, 2017	Moral Hazard In Insurance Markets
13	**Monday**	**Oct. 16, 2017**	**Evening Review Session**
NC	**Wednesday**	**Oct. 18, 2017**	**Midterm Exam Module 2 (6-7:20 PM)**

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

We begin by studying typical mistakes that arise when making decisions involving risk, followed by an analysis of how firms can manage their own risks. Throughout we identify 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. Finally, we show that risk management decisions may be made by managers to further their own welfare, rather than that of owners. We close with an assessment of the legal duties of directors and officers and liabilities toward customers and other parties.

14	Monday	Oct. 23, 2017	Subjective Expected Utility and Ambiguity
15	Wednesday	Oct. 25, 2017	Behavioral Economics
16	Monday	Oct. 30, 2017	Corporate risk management and firm value
17	Wednesday	Nov. 1, 2017	Limited liability and real options
18	Monday	Nov. 6, 2017	Motivation for Corp Risk Management
19	Wednesday	Nov. 8, 2017	BP Case Study
20	Monday	Nov. 13, 2017	Motivation for Corp Risk Management (cont)
21	Wednesday	Nov. 15, 2017	Corporate legal liability
22	Monday	Nov. 20, 2017	Corporate risk management strategies
NC	Wednesday	Nov. 22, 2017	*Thanksgiving Break*
23	Monday	Nov. 78, 2017	Corporate risk management strategies (cont.)
24	Wednesday	Nov. 29, 2017	Insurance Markets and Pension Reform
25	**Monday**	**Dec. 4, 2017**	**Evening Review Session**
NC	**Wednesday**	**Dec. 6, 2017**	**Midterm Exam Module 2 (6-7:20 pm)**