Financial Institutions, Markets, and Risk (E4729)  
Columbia University School of Engineering and Applied Science  

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Course Description:  
This core curriculum course introduces students pursuing a graduate degree in financial engineering to the key areas and concepts of modern finance. The course’s objective is to connect the dots between financial theories and disciplines and provide a broad perspective on how financial theory and practice interact, preparing students for successful careers in the financial industry and facilitating in-depth studies that follow.

Lecture 1 (7/15/13)  Introduction to Finance  
- Course objectives & logistics  
- Economic and Financial Habitat  
- Languages of Finance  
- Overview of Balance Sheets and Income Statements  
- Flows of Funds and Risks  
- Primary and Secondary Markets  
- Role of Macroeconomic Drivers and Expectations  
- Leverage and Rates of Return

Assignments:  
Prior to the class, watch the movie “It’s a Wonderful Life” (1946)  
SAB: Chapters 2; 16.1; 16.9; 22.5; 22.8  
*Homework Essay #1:* What happened at JP Morgan (London Whale)?

Lecture 2 (7/17/13)  Financial Analytics and Yield Curves  
- Valuation of Riskless Securities  
- Yield Curves  
- Spot and Forward Rates  
- Preview of Risky Valuation  
- Quick Overview: Valuation of Equity Securities (dividend discounting models)

Assignments:  
SAB: Chapters 5, 14.1-4; 15.2-15.4

Lecture 3 (7/22/13)  Overview of Major Financial Markets  
- Fixed Income Markets  
- Derivatives  
- Case Study: The U.S. Mortgage Market  
- Equity Markets  

Assignments:  
SAB: Chapters 3, 16.2, 16.8, 17.1; 17.9  
Handouts on major Fixed Income Markets
- Market Efficiency
- Risk-Based Transparency
- Utility Theory
- Expected Returns and Standard Deviations
- Portfolio Theory
- The Market Model

Assignments:
SAB: Chapters 4.2; 6; 7; 8; 9.4
Financial Darwinism pp. 35-36 (on risk-based transparency)

Lecture 5 (7/24/13)  Macroeconomics (Guest Lecture)
- The Standard Model
- Macroeconomics
- Recent Economic History
- Why Macro Matters
- Case I: The Debasement of Fiat Money
- Case II: Shifting Monetary Winds
- Indicator Analysis
- Current Economic & Market Snapshot

Optional Reading:
The WSJ Guide to the 50 Economic Indicators That Really Matter

Lecture 6 (7/31/13)  Portfolio Theory & CAPM
- Remainder of the Portfolio Theory from 7/23
- CAPM
- Link to APT

Lecture 7 (8/5/2013)  Regulation and Risk Management
- Regulation (pre-crisis)
- Regulation (post-crisis)
- Valuation vs. Risk Management
- Risk Management: Stress Testing
- Risk Management: Individual Risk Exposures
- Risk Management: Aggregate Risk Exposures
- Credit Risk Management

Assignments:
SAB: Chapters 9.1-9.3
Golub-Tilman, Risk Management, Chapter 2
Lecture 8 (8/7/2013) Financial Darwinism

- The Setting
- The Disconnect
- Financial Darwinism = Dynamism
- Crisis Management as a Core Value Proposition
- Careers in Modern Finance

Final Exam (8/12/13)

Required Texts:
Sharpe, Alexander & Bailey, Investments, 6th Ed., Prentice Hall (SAB)

Optional Texts and Other Readings:
Tilman, Financial Darwinism, J. Wiley & Sons, Inc., 2008
Roger Lowenstein, When Genius Failed: The Rise and Fall of Long-Term Capital Management.
Peter Bernstein, Against the Gods: The Remarkable Story of Risk
Burton Malkiel, A Random Walk Down Wall Street

Grading: 70% Final Exam; 30% Papers

Leo M. Tilman is President of Tilman & Company, a strategic advisory firm that serves corporations, financial institutions, governments, and institutional investors worldwide. Through thought leadership and actionable solutions, Tilman & Company helps its clients create lasting value for the benefit of all stakeholders. Prior to founding the firm, he held senior positions with BlackRock and Bear Stearns, where he was Chief Institutional Strategist and Senior Managing Director. Mr. Tilman teaches finance at Columbia University and is the author of three books translated into foreign languages: Financial
Darwinism (2009), Asset/Liability Management (2003), and Risk Management (2000). In 2010, in collaboration with the Nobel economist Edmund Phelps, he co-authored a Harvard Business Review proposal to create the First National Bank of Innovation – a novel financial institution dedicated to financing innovative entrepreneurial projects and fostering economic dynamism. In a 2012 European Financial Review article, he redefined risk intelligence and designated it a new essential competence for companies and investors who aspire to contribute to economies and societies. Mr. Tilman has been profiled as a Business Visionary by Forbes, a distinction given to “influential authors, decision makers, and thought leaders in the field of business.” He is a contributing editor of The Journal of Risk Finance and a Fellow of the Foreign Policy Association. Mr. Tilman serves on the board of directors of Atlantic Partnership and advisory boards of the Center on Capitalism and Society at Columbia University and British American Business. He was honored by the World Economic Forum among a select group of executives, public figures and intellectuals recognized for “their professional accomplishments, commitment to society and potential to contribute to shaping the future of the world.” Mr. Tilman received B.A. and M.A. degrees in mathematics from Columbia University and executive education in leadership and public policy from the Kennedy School of Government at Harvard University.