IEOR E4003: Industrial Economics
Syllabus

• Financial Analysis
  o Cash Flow Cycle
  o Balance Sheet
  o Income Statement
  o Sources and Uses Statement
  o Cash Flows and Free Cash Flows

• Compounding
  o Ratio Analysis
  o Discrete Compounding (uniform, linear-gradient and geometric gradient)
  o Continuous Compounding
  o Equivalence of Cash Flows
  o Effect of Inflation
  o Cash Flow Transform Techniques (Z-transforms and Laplace transforms)

• Figures of Merit
  o The Net Present Value, the Future Value and the Annual Equivalence Criteria
  o The Internal Rate of Return, Solomon’s Average Rate of Return and The Modified Internal Rate of Return Criteria
  o The Benefit-Cost Ratios Criteria
  o The Discounted Payback Period
  o The Project Balance Concept; Conventional, Potentially Profitable, Pure and Mixed Investments

• Weighted Average Cost of Capital
  o WACC Tree
  o Estimating WACC parameters
  o Cost of Debt, Cost of Equity, CAPM and Beyond
  o Unlevering and Relevering Betas

• Deterministic Capital Budgeting Models
  o Decision Rules for Selecting Among Multiple Alternatives
  o Comparison of Industrial Projects with Unequal Lives
  o The Use of Linear Programming Models
  o Pure Capital Rationing, with no Lending or Borrowing Allowed
  o Capital Budgeting, with Equal Borrowing and Lending Rates
  o Capital Budgeting, with Unequal Borrowing and Lending Rates
  o Discrete Capital Budgeting
• **Utility Theory**
  - Preference and Ordering Rules
  - Properties of Utility Functions
  - Empirical Determination of Utility Functions
  - Mean-Variance Analysis

• **Optimization under Uncertainty**
  - Decision Trees and Decision Analysis
  - Dynamic Programming
  - Applications to Pricing and Airline Revenue Management
  - Simulation

• **Real Options Analysis**
  - Valuing Entry and Exit Options
  - Fireflies Before the Storm
  - How Much is Flexibility Worth?
  - Making Real Options Real
  - Real Power of Real Options