MS Finance Courses

Summer Foundations Courses

FIN B62 510 Introduction to Finance

The main topics to be covered in this course are (1) principles of investments, (2) financial analysis of corporate projects, (3) cost of capital, and (4) capital structure and financing policies. The objective of the company is assumed to be shareholder value maximization. Shareholder value is created by earning more than the cost of capital. The cost of capital is an opportunity cost – what investors could expect to earn on comparable investments in the financial markets. To understand the cost of capital, we need to understand the viewpoint of investors. Furthermore, to understand whether a project earns more than the cost of capital, we need to know how to estimate and discount project cash flows. So, the first three topics are closely connected. The main question in the fourth topic is whether we can create shareholder value through the financial structure of the firm. For example, we will ask whether we can lower the cost of capital by financing with debt instead of equity, or vice versa. 2 Credits.

ACCT B60 560 Introduction to Accounting (Online Course)

In this course, we will study the three fundamental financial accounting issues, including (1) recognition, (2) measurement/valuation, and (3) classification/disclosure and consider how business transactions are reflected on the financial statements using generally accepted accounting principles (GAAP). We will cover the four primary financial statements (balance sheet, income statement, statement of stockholders' equity, and statement of cash flows), the supporting footnotes to these statements, and several reports (annual reports, proxy statements, and press releases). The course incorporates both a preparer's perspective (i.e., GAAP requirements for recording and presenting financial information) and a user's perspective (i.e., how an investor or analyst can interpret and use financial statement information). 2 Credits.

ACCT 562 Financial Accounting II (Intermediate Accounting)

Primary subject matter includes asset and liability valuation and income measurement addressed at a deeper level than in introductory financial accounting. Recent additions to the professional accounting literature and the conceptual underpinnings of corporate financial reporting are emphasized, and articles from the popular business press are used to illustrate the factors that motivate corporate reporting decisions. Financial reporting issues related to a variety of topics not covered in earlier accounting coursework, such as segment reporting, securitization, and convertible securities, are introduced. 2 Credits.
**Fall Semester**

**ACCT B60 503 Business Analysis Using Financial Statements**

In this course we use concepts from financial accounting, finance, and strategy to develop models used by financial analysts in valuing equity securities (although we will focus on equity valuation, our approach is applicable to issues faced by managers considering investment opportunities). We will discuss/review a variety of models, including the dividend model, the free cash flow model, the method of comparables/multiples, and the asset-based valuation model. These more traditional models will be contrasted with the residual income valuation model, a relatively recent valuation innovation. 1.5 Credits.

**ACCT B60 503B Advanced Business Analysis Using Financial Statements**

This course builds on ACCT 503. We investigate approaches to forecasting future value drivers of firms and then the preparation of pro forma financial statements based on these forecasts. The concepts will be applied by having students prepare an equity analyst report. The report is the communications of evidence collected from a systematic study of a firm, its environment, and its future prospects to justify a recommendation. Prerequisite: ACCT 503. 1.5 Credits.

**FIN 500K Finance Consulting Seminar**

Students returning from summer internship and research project experiences will conduct academic research in the areas of their summer experiences and will write papers on research topics as appropriate, under the direction of the supervising faculty member. In addition, students will be required to make presentations about their work experiences and research findings to their classmates. The timing of the course will Fall A in the second fall semester for Quantitative Finance students in the 17-month version of the program. Prerequisites: Completion of the first year of the MSF program. Other students may apply to participate with the permission of the instructor. 1.5 Credits.

**FIN 500N Corporate Finance and Investments Industry Seminar**

This course is designed to expose SMP and MBA students to the language, issues, and skill sets necessary for careers in corporate finance, investment banking, private equity and asset management. The primary intent of this course is to offer a detailed introduction to financial markets, as well as those people, companies and other institutions that participate in it as providers of capital, users of capital or the players that work to intermediate between these two. 0.5 credits.

**FIN 500R Topics in Quantitative Finance**

The main objective of this course is to familiarize students with the current cutting-edge techniques implemented by the quantitative finance industry. The contents of this course can vary from year to year. Topics may include risk management, statistical arbitrage, and derivative pricing and hedging. Some practical projects may be used for implementation of these techniques. 1.5 Credits.
**FIN 500V Risk Management and Insurance**

This course will provide an introduction to risk management and insurance. We will explore enterprise risk management broadly and understand what risk is, and how risk can be managed and or mitigated. We will understand the different kinds of risk and the difference between insurance and hedging. We will study the various insurance markets and the basics of how they operate. We will especially focus on the issues of risk management and insurance from an insurance issuer’s perspective and from a corporate risk manager’s perspective. We will also review the insurance operations of Berkshire Hathaway to understand the operations of a diversified insurance company and of Allstate Corporation and State Farm Insurance as we review the basics of auto and homeowners insurance respectively. 1.5 Credits.

**FIN 521 Financial Intermediation**

Discussion centers on the role of banking institutions and credit markets, the design of financial contracts and institutions and the public regulation of financial markets. After establishing a framework for analyzing financial institutions and markets, we turn to a current topic of special interest. Students will research and present a report advocating a particular point of view. 1.5 Credits.

**FIN 523B Mergers and Acquisitions**

The course will provide an in depth view of the theory and empirical regularities of various corporate control transactions. Specifically, we will discuss valuation of target firms, possible sources of value creation, various motives for mergers, tax consequences of mergers, legal issues in mergers, financing an acquisition, defensive tactics in hostile takeovers, going-private transactions and bidding behavior of acquirers. The method of instruction is a mix of lecture and case analysis. Prerequisite: FIN 534. 1.5 Credits.

**FIN 524 Options and Futures**

Focuses on futures with an introduction to options. Discusses forward and futures pricing, and the use of various futures contracts to hedge commodity price risk, interest risk, currency risk, stock portfolio risk, and other risk exposures. 1.5 Credits.

**FIN 524B Derivative Securities**

Provides an in-depth analysis of valuation and trading strategies for options and other derivative securities which have applications across areas of finance such as hedging, swaps, convertible claims, mortgage payments, index arbitrage, insurance, capital budgeting and corporate decision making, and are responsible for many new innovations and developments of the financial markets. Prerequisites: FIN 524. 1.5 Credits.
**FIN 527 Financial Markets**

This course will facilitate further learning in the finance track by providing insights into various financial markets, financial institutions, associated market participants, select representative transactions and industry conventions. Students will examine the role of regulators, rating agencies, commercial and investment banks, and investors in the debt, equity and derivatives markets. In addition, in the context of the Financial Crisis, the role of regulation, monetary policy, leverage and human behavior will be discussed as possible root causes of the crisis with an emphasis on the various market failures in specific markets and their impact on market participants. Lastly, the role of revised regulations and the future of financial innovation will be debated. 1.5 credits.

**FIN 530 International Finance**

Measuring and hedging exposures to exchange rate fluctuations is a central topic of this course. The relationships among spot and forward exchange rates, interest rates, and inflation rates are described. Additional topics include capital budgeting for international projects, international capital markets, and international portfolio diversification. 1.5 credits.

**FIN 532 Investment Theory**

A course in the theory of risk and return in capital markets. Topics covered correspond to those which are covered in the CFA level 1 exam. We will cover the CAPM and APT models of asset pricing and will discuss various measures of mutual fund performance evaluation which arise from these models. We will discuss interest rate determination and also introduce the concepts of price and reinvestment risk in fixed income securities. 1.5 Credits.

**FIN 532B Data Analysis for Investments**

The objective of this course is to obtain an in-depth understanding of some of the major empirical issues in investments. Based on recent research articles and cases, students are required to learn the facts, theories and the associated statistical tools to analyze financial data. The topics for this course include models of stock returns, Bayesian and shrinkage estimations for expected returns and covariances, multifactor asset pricing models, GARCH models, principal components, asset allocation, stock screening, predictability, performance evaluation, anomalies, limits to arbitrage and behavioral finance. Prerequisite: FIN 532. 1.5 Credits.

**FIN 533 Real Option Valuation**

This is an applied course in capital budgeting under uncertainty and flexibility. Traditional NPV analysis assumes that corporate investments are "now or never" and that they are irreversible. However, most corporate projects have a great deal of flexibility in their timing, scale, etc. Our goal is to develop more advanced capital budgeting skills so that the student may attack real-world corporate investment decisions in a sophisticated way. The ability to construct a sophisticated capital-budgeting model is irrelevant if its structure and results cannot be communicated in a clear and convincing fashion. This is particularly important for real-option valuation, as most managers do not understand the issues of risk-neutralization and convenience yield. Furthermore, there are many that are skeptical of the assumptions required for a contingent-claims analysis. Their critiques must be addressed. Prerequisite: FIN 532. 1.5 credits.
FIN 534 Advanced Corporate Finance I – Valuation

This course considers a broad range of issues faced by corporate financial managers with respect to the valuation of projects, divisions, and entire companies. The prime focus will be on assessing the profitability of different business alternatives in a forward-looking sense. It will explicitly consider the impact of financing decisions on the valuation of business alternatives. Other topics covered include an examination of EVA as both a valuation and performance measurement tool, and a brief introduction to Real Options as an alternative to discounted cash flow analysis. The course is designed to be “hands-on”, and will heavily focus on direct applications of the theory and the individual development of spreadsheet modeling skills. Students who successfully complete the course should possess a set of cutting-edge valuation skills. 1.5 Credits.

FIN 534B Advanced Corporate Finance II – Financing

This course considers a broad range of issues faced by corporate financial managers with respect to the financing of investment opportunities. In this course, we turn to the right-hand side of the balance sheet as a direct follow up to the skills acquired in the Advanced Corporate Finance I - Valuation, a course that focused on the left-hand side of the balance sheet. The course is designed to be “hands-on”, and we will heavily focus on direct applications of the theory of financing to business practice. To that end, we will cover topics related to the valuation of bond and convertible securities, estimating the costs of financial distress, the reorganization of firms in financial distress, deriving an optimal capital structure, and the effects of management stock option grants on valuation. Prerequisite: FIN 534. 1.5 Credits.

FIN 534C Advanced Corporate Finance III – Corporate Financial Strategy

This course addresses advanced valuation topics, and applies both theory and practical valuation methods to value real world companies-instead of case studies. You will be valuing foreign and U.S. companies in various industries such as banking, industrials, mining, and information technology. This course assumes that you have basic valuation knowledge and exposes you to the complexities involved in performing real-world valuations, and the myriad of issues that practitioners must address. Prerequisite: FIN 534 1.5 Credits.

FIN 538 Stochastic Foundations for Finance

This is a foundations course, which is designed as a prerequisite to FIN 539, Mathematical Finance. It is therefore mainly designed for students in the Masters in Finance program who aim at quantitative positions in investment banks, hedge funds and consulting firms. While financial examples will be given, the primary focus will be on stochastic process and stochastic calculus theory. Students interested in applications of the theory are expected to take follow-on courses. Topics to be covered include: general probability theory; Brownian motion and diffusion processes; martingales; stochastic calculus including Ito’s lemma; and jump processes. 1.5 Credits.
**FIN 549H Special Topics: Real Estate Finance**

This course provides a broad introduction to real estate finance and investments. Topics include both equity and debt. We begin with an overview of real estate markets in the United States. On the equity side students will be introduced to the fundamentals of real estate financial analysis, including pro forma analysis and cash flow models, and elements of mortgage financing and taxation. Ownership structures, including individual, corporate, partnerships and REITs will also be covered. On the debt side, we examine a number of financing tools in the context of the evolution of the secondary mortgage market, both residential and commercial. Those wishing to pursue more advanced topics in real estate finance could follow this course with Fixed Income and Mortgage-Backed Securities. 1.5 credits.

**FIN 552 Fixed Income Derivatives**

This course builds on the materials developed in FIN 537, Advanced Derivative Securities. Here we will cover market-model pricing of LIBOR caps and floors, swap market model pricing of swaptions, Hull-White and Heath-Jarrow-and-Morton models, and the LIBOR market model for pricing swap derivatives via Monte Carlo techniques. We will also consider how to use these models to price various types of exotic interest rate derivatives commonly seen in practice. Prerequisite: FIN 537. 1.5 Credits.

**FIN 560A Research Methods in Finance**

The course is designed to prepare students for independent research in finance by exploring methods and techniques in a manner that will allow the students to implement them correctly and efficiently. The curriculum will emphasize practical applications of empirical methods used in financial research and how to implement them. Students in the course will learn empirical methods in corporate finance and asset pricing; obtain basic knowledge and familiarity of the databases used in common finance research; get exposure to recent research in finance which applies the methods covered; and learn how to implement the methods covered using relevant programming languages. 3 credits.

**MEC 537 Data Analysis, Forecasting & Risk Analysis**

Course develops the methods and techniques of econometrics that are of particular relevance to students of business and economics. A range of models, namely single equation regression models, time series models and models for discrete response data are studied. The purpose of building these models is described within the context of aggregate data, and micro data at the level of firms and individuals. Procedures to evaluate the estimated models are discussed, and emphasis is placed on the interpretation of results and the forecasting of future observations. Students are expected to complete an individual (non-group) project in which the technique developed in the course are applied to real world problems. The course should be valuable for a variety of students including those with primary interest in finance, marketing, operations, and accounting. 3 Credits.
MGT B63 537 Invest in Your Career

This is a customized career preparation course to help assess strengths and weaknesses and professional interests to best position students with regard to careers in areas of choice such as: securities research, securities and commodities quant-based trading, investment management, corporate finance, finance-focused government jobs, investment banking and academia, including Ph.D. programs and other pure research pursuits and/or teaching. The course also will provide opportunities to learn how to enhance business communication skills, networking and interviewing skills. 0 credits.

MGT B63 550Z Professional Communication Forum

The course focuses on the development and delivery of a technical presentation in a persuasive manner, reflecting a typical consulting environment. The course teaches students communication skills necessary to communicate to both technical and non-technical audience members. The students will deliver both an oral team presentation and a client proposal “leave behind.” 1.5 Credits.

E81 CSE 501N Programming Concepts and Practice (Java Programming) plus lab

An introduction to software concepts and implementation, emphasizing problem solving through abstraction and decomposition. Introduces processes and algorithms, procedural abstraction, data abstraction, encapsulation, and object-oriented programming. Recursion, iteration, and simple data structures are covered. Concepts and skills are mastered through programming projects, many of which employ graphics to enhance conceptual understanding. Java, an object-oriented programming language, is the vehicle of exploration. Active-learning sessions are conducted in a studio setting in which students interact with each other and the professor to solve problems collaboratively. An evening exam at which attendance is required will be on Monday, March 4th from 6:30-8:30 p.m. Prerequisites: Comfort with algebra and geometry at the high school level is assumed. Patience, good planning, and organization will promote success. This course assumes no prior experience with programming. 3 Credits.

Spring Semester

ACCT 500G Analysis of Financial Institutions & Financial Instruments

The main goal of the course is to give you an in-depth understanding of how financial reports provide unusually accurate and detailed (but not perfect) information about the risks and performance of firms in the financial services industries. These firms' financial statements increasingly are based on fair value accounting and their financial reports typically include extensive risk and estimation sensitivity disclosures. Both fair value accounting and risk and estimation sensitivity disclosures are necessary ingredients for financial reports to convey the risk and performance of financial services firms in today's world of complex, structured, and risk-partitioning financial instruments and transactions. While financial services firms often apply fair value accounting and risk and estimation sensitivity disclosures imperfectly (or worse), careful joint analysis of the information they do provide invariably yields important clues about their risks and performance. 1.5 credits.
**FIN 500Q Quantitative Risk Management**

Risk management is an increasingly important, but often misunderstood, aspect of corporate financial policy. This course is designed to provide solid theoretical and technical foundations for financial risk management with applications to a variety of different industries and firms. Measures of risk, regulatory requirements for risk control, and risk management strategies employing derivative securities against market and credit risks will be analyzed. In addition, risk management methods and tools that are commonly used in practice will be introduced. Prerequisite: Fin 524, Fin 524B. 3 credits.

**FIN 500S Tools of Early Stage Investing**

The course provides basic terminology and tools used in evaluation (not just valuation) of early-stage venture investing. Topics covered include term sheets, term sheet negotiation, due diligence, financial projections, and the Private Equity industry. The course will be offered in the Spring B term, and a satisfactory grade in this course will be a strict prerequisite for participation in the fall private equity experiential learning course (Fin 500L: SSVF), along with an interview. Observe, however, that enrollment in the subsequent experiential course is not required to derive benefit from the tools course as it would be useful to individuals looking to enter the fields of investment banking, angel & venture investing, buyout investing, and entrepreneurship/starting a business. 1.5 credits.

**FIN 523B Mergers and Acquisitions**

The course will provide an in depth view of the theory and empirical regularities of various corporate control transactions. Specifically, we will discuss valuation of target firms, possible sources of value creation, various motives for mergers, tax consequences of mergers, legal issues in mergers, financing an acquisition, defensive tactics in hostile takeovers, going-private transactions and bidding behavior of acquirers. The method of instruction is a mix of lecture and case analysis. Prerequisite: FIN 534. 1.5 Credits.

**FIN 525 Fixed-Income Securities**

This course analyzes investment in bonds and related fixed-income instruments. Major topics are bonds, interest rate risk, and derivative securities. Bond topics include interest rate compounding conventions, yield curves, and forward interest rates. Risk analysis covers duration, convexity, and immunization. Derivative securities are analyzed using an option-theoretic approach to valuing interest rate contingent claims. Prerequisites: FIN 524 and FIN 524B. 1.5 Credits.

**FIN 528 Investments Praxis**

In this course students serve as managers of a portfolio, the Investment Praxis Fund, which is owned by the school. Students will analyze investment opportunities in various industries and present recommendations to the class for possible purchases or sales of securities. Students must demonstrate that their investment decisions are consistent with the style and objectives of the fund. Valuation tools and financial statement analysis are emphasized as part of a thorough analysis. The course will emphasize contact with investment professionals such as portfolio managers, securities traders, consultants, custodians, and plan sponsors. At the end of the semester the students will report on their performance to the advisory board of the fund which is composed of University financial officers and outside investment professionals. 3 Credits.
FIN 530 International Finance

Measuring and hedging exposures to exchange rate fluctuations is a central topic of this course. The relationships among spot and forward exchange rates, interest rates, and inflation rates are described. Additional topics include capital budgeting for international projects, international capital markets, and international portfolio diversification. 1.5 credits.

FIN 531 Venture Capital and Private Equity

Private equity funds are an important source of financing for new ventures and buyouts of established companies. Asymmetric information and the need for monitoring and control are among the reasons private equity has evolved as a substitute for other financing sources, such as bank loans and public debt and equity issues. This course will discuss how private equity funds are raised and structured and how private equity investors (i) analyze investment opportunities, (ii) interact with the management of the companies they finance, and (iii) exit investments. Students will be expected to have some proficiency in financial valuation. Prerequisite: completion of at least one of the following: Advanced Corporate Finance I—Valuation, Investment Banking, Mergers & Acquisitions, Financial Statement Analysis or consent of the instructor. At least one of the following recommended: FIN 534, FIN 523B, FIN 549F, or ACCT 503 or permission of the instructor. 1.5 credits.

FIN 536/ACCT 507 Financial Issues in Leasing

This course is devoted to studying the various elements that are involved in identifying leasing opportunities and structuring a lease. Topics covered include accounting and tax issues related to leases, the legal and financial structure of a lease, options embedded in lease agreements, and the marketing and negotiation of leases. 1.5 credits.

FIN B62 537 Advanced Derivative Securities

This course focuses on implementation of models for pricing and hedging derivative securities in the equity, currency, and fixed-income markets. Students will learn to write programs in a programming environment such as MATLAB to implement the Black-Scholes model, binomial models, Monte-Carlo methods and finite-difference methods. The derivatives studied will include exotic equity and currency derivatives and caps, floors and swaptions. The goals of the course are to learn more about the various instruments that are traded, the various assumptions and methods that may be chosen in modeling them, and the importance of the assumptions in determining the prices and hedges that are chosen. The course will be especially useful to students pursuing careers in sales and trading who will interact with research departments and students pursuing careers in asset management. Prerequisites: FIN 524 and 524B. 3 Credits.

FIN 539 Mathematical Finance

This course focuses on continuous-time derivative pricing and optimal security trading. In the first half of the course, students will learn how to derive partial differential equations and pricing formulas for various derivative securities including options with stochastic volatility, options with jump diffusion, and American style options. In the second half of the course, students will learn how to solve optimal portfolio selection problem with or without portfolio constraints through both the Hamilton-Jacob-Bellman equation approach and the martingale approach. The course is mainly designed for students in the Masters in Finance program who aim at quantitative positions in investment banks, hedge funds and consulting firms. The course might also be of interest to those who want a more theoretical approach to analyze embedded derivatives and risk management issues at corporations. Prerequisites: FIN 524 and FIN 538. 1.5 Credits.
FIN 549H Special Topics: Real Estate Finance

This course provides a broad introduction to real estate finance and investments. Topics include both equity and debt. We begin with an overview of real estate markets in the United States. On the equity side students will be introduced to the fundamentals of real estate financial analysis, including pro forma analysis and cash flow models, and elements of mortgage financing and taxation. Ownership structures, including individual, corporate, partnerships and REITS will also be covered. On the debt side, we examine a number of financing tools in the context of the evolution of the secondary mortgage market, both residential and commercial. Those wishing to pursue more advanced topics in real estate finance could follow this course with Fixed Income and Mortgage-Backed Securities. 1.5 credits.

FIN 551 Advanced Fixed Income and Credit Risk Modeling

This course is an advanced course in fixed-income. This means that a basic knowledge of fixed-income markets and concepts is assumed. The focus of the course is on the modeling of fixed-income securities. We will examine the behavior of the yield curve and discuss what this suggests for hedging liabilities. We will cover models of the term structure and of various types of fixed-income derivatives including caps, floors, and swaptions. We will also introduce credit-risk modeling, credit-default swaps, and collateralized debt obligations. Prerequisites: Fin 525, 538, and 539. 1.5 credits.

MEC 538 Economics of the Organization

Business organizations are complex systems with mutually dependent parts. Understanding the economic factors that influence how the organizational pieces function together can be a daunting task. The goal of this course is to provide an economic framework for the analysis of a variety of challenges that face businesses, both at the organizational and individual employee levels. In this course we will consider what economics can say about the efficient organization of firms and businesses, and provides an economic approach to solving organizational and incentive problems. The aim of this mini is to describing general organizational issues facing firms, such as incentive problems arising from adverse selection, moral hazard, and agency. We consider alternative solutions to these problems and then apply these lessons to readings and cases. 1.5 Credits.

MEC 540 Money, Capital Markets and Economic Growth

An introduction to the U.S. monetary and financial system and its interaction with the overall economy. Among topics considered are the determination of interest rates, the relationship between monetary and "real" sides of the economy including savings and investment decisions and inflation rates, and the role of capital markets in GDP and productivity growth. 1.5 Credits.

MEC 592 Competitive Industry Analysis

Uses economic and game-theoretic models to analyze behavior of firms. Focus will be split between evaluating the competitive environment within industries and developing competitive strategies that are responsive to specific competitive forces facing individual firms. Topics typically covered include models of price and quantity competition, barriers to entry, commitment strategies and credible threats, product differentiation, vertical integration, research and development, and patenting strategies. 3 Credits.
**MGT 501 Management Center Practicum**

Students work in four-person teams on consulting projects, applying insights from their course work to real-world business problems under faculty supervision. Each student is expected to spend about 150 hours on the project. Grades are based on the quality of the final written and oral reports, as determined by the faculty supervisor. Students are paid a small gratuity, the amount, depending on the quality of the work. 3 credits.

**MGT 511A Law and Business Management**

We will review different rules of substantive law which affect the conduct of individuals and businesses. We will analyze different legal theories and rules of substantive law which regulate the conduct of individuals and businesses and which impose liability for damages on individuals and business entities when those rules are violated. We will survey basic rules of criminal law, intentional torts, and negligence. We will next focus on the rules affecting the making and performance of contracts, and the liability which results from breach of contractual relationships. This will include general contract law, as well as specific rules that exist in the sale of goods and merchandise, and in the purchase, ownership and sale of real property. In addition, we will also analyze and compare the choices available for dispute resolution, including mediation, arbitration, and trial in court. 1.5 credits.

**MGT 550F Critical Thinking Processes and Modeling for Effective Decision Making**

Critical thinking is the cornerstone of effective decision-making. This course will introduce students to a variety of tools that will enhance their critical thinking skills and ultimately their ability to make effective decisions. Students will gain practice in assessing critical thinking by others, which will help them develop a plan for ongoing advancement of their own critical thinking skills. The course has the following objectives: (a) to introduce students to the science of fact based, data driven, decision making; (b) to expose students to different approaches, support tools, and analytical methods for decision making; (c) to enhance and reinforce students’ critical thinking skills and their ability to intelligently use information; (d) to develop, integrate and reinforce students’ modeling skills (often based on spreadsheet usage) by using such skills in a variety of decision-making-oriented applications; and (e) to introduce students to a process for team decision making. These objectives will be facilitated through the three key quantitative modeling tools taught in this course, which are: (1) decision analysis; (2) simulation for risk-analysis and modeling uncertainty; and (3) optimization tools and constrained resource allocation. 3 credits.

**E81 CSE 502N Fundamentals of Computer Science**

This course, intended for graduate students without a computer science background, covers the core components seen in a computer science undergraduate curriculum on which our graduate level courses rely. Topics include fundamental algorithms, data structures, proof techniques, computational models, machine organization, and software design and implementation. Prerequisites: graduate standing; CSE 501N or prior programming experience; some mathematical sophistication highly desirable. 3 credits.