



PREPROGRAM FOUNDATIONS REQUIREMENTS

Preparatory work begins in July/August, is in addition to required credits, and does not affect GPA.

DAT 500V: Introduction to R Programming *.5 credit*
 ACCT 560: Introduction to Financial Accounting

FALL 1 REQUIRED COURSES	SPRING REQUIRED COURSES	FALL 2 REQUIRED COURSES
<p>REQUIRED CREDITS: 15</p> <p>Core: MGT 560F: Professional Business Communication <i>1.5 credits</i> DAT 500S: Predictive Analytics for Business Decision-Making <i>3 credits</i> DAT 561: Introduction to Python & Data Science <i>3 credits</i></p> <p>Track: FIN 5203: Financial Management <i>3 credits</i></p> <p>Fall A 1.5 credits course : Fall B 1.5 credits/course DAT 560G: Database Design & SQL : DAT 500N: Prescriptive Analytics : DAT 560M: Big Data & Cloud Computing</p>	<p>REQUIRED CREDITS: 15</p> <p>Core: DAT 500W: A/B Testing in Business & Social Science <i>3 credits</i></p> <p>Track: FIN 550F: Financial Technology (FinTech) – Methods & Practice <i>3 credits</i></p> <p>Spring A 1.5 credits/course : Spring B 1.5 credits/course FIN 524: Options & Futures : DAT 560E: Data Visualization FIN 525: Fixed Income Security : DAT 562: Text Mining FIN 532: Investments Theory FIN 534: Advanced Corporate Finance I – Valuation</p>	<p>REQUIRED CREDITS: 3</p> <p>FIN 560G: Seminar in Financial Technology <i>3 credits</i></p>
FALL OR SPRING RECOMMENDED ELECTIVE COURSES		EXPERIENTIAL LEARNING REQUIREMENT
<p>ELECTIVE CREDITS: 3+</p> <p>CSE 501N: Intro to Computer Science <i>3 credits*</i> MKT 500U: Digital Marketing <i>1.5 credits</i> CSE 514A: Data Mining <i>3 credits*</i></p> <p style="text-align: right;">DAT 565E: Deep Learning for Prediction of Business Outcomes <i>1.5 credits*</i> INFO 558: Applications of Deep Neural Networks <i>3 credits*</i></p>		<p>COMPLETE 1 COURSE: MGT 551E: Internship, Business, & Application <i>1.5 credits</i> FIN 500K: Financial Consulting Projects <i>3 credits</i> FIN 501P: CFAR Practicum <i>3 credits</i> MGT 501V: Applied Problem Solving for Orgs <i>1.5 credits</i></p> <p>* Elective courses offered either in Fall or Spring semesters</p>
<p>TOTAL CREDITS: 39 MSA Common Core: <i>18</i> MSFTA Track: <i>15</i> Elective: <i>6</i></p>		

Academic Year 2021-2022 The degree requirements in this document apply to students entering Washington University during the 2021–2022 academic year.

Under the flat tuition rate, students may take up to 18 credits per semester. Additional credits must be approved and are charged at the per credit rate. Every effort is made to ensure that the information is accurate and correct as of the date of publication (5/7/21). Washington University reserves the right to make changes at any time without prior notice. Therefore, this curriculum document may change from time to time without notice. The governing document at any given time is the then-current version, as published online.



MSA – Financial Technology Course Descriptions

Summer Foundations Workshops

MKT 500V Basics of R Programming

R has become the tool of choice for many data science and customer analytics professionals in every industry and field. It is not surprising to see a requirement for being familiar with R in job descriptions. R is very flexible in carry out data analysis. Part of the benefit of being open source is that many programmers/researchers are constantly introducing new statistical analysis tools into R through R packages. Given all the benefits, R does have a relatively steeper learning curve. To better prepare MSCA students, we introduce this 2 day introduction to R programming course. This class will help you master the basics of R. We will start from the very beginning - installation of the program. No prior knowledge in programming is required. Through in class demonstration and lots of hands-on practice, by the end of the second day, you will have the chance to undertake your own data analysis and solve relevant business problems using R. 0.5 Credits. Graded Pass/Fail.

ACCT 560 Introduction to Accounting

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).

Required Core Courses

DAT 500N Prescriptive Analytics

This course covers optimization models and tools as they apply to the design and analysis of supply chains. Production planning, distribution, network design, and revenue management problems are covered using the methods of linear, non-linear, and integer programming. Upon successful completion of this course, students will demonstrate competency in formulating and solving supply chain optimization models of real-life complexity using state-of-the-art software. They will become proficient with industrial strength software tools like AMPL and Gurobi alongside Excel's Solver. The course emphasizes proficiency in model-building and using software tools rather than theory.

1.5 credits

DAT 500S Predictive Analytics for Business Decision-Making

Predictive Analytics deals with the employment of formal learning from business experience, using business data, to predict the future behavior of customers or other critical organizational elements in order to drive better business decisions. This course emphasizes data situations that students are likely to face in marketing, finance, manufacturing and consulting jobs. Students will analyze real-world business datasets using various advanced analytic techniques such as logistic regression, decision trees, neural networks, stochastic gradient boosting, MARSplines, Ensembles, Clustering, Associations etc. The focus of the course lies in the conversion of raw and messy business data in to robust actionable predictions for decision-making. 3 credits.

DAT 500W A/B Testing in Business and Social Science

This course introduces students to causal methods that are used to measure the impact of business and policy decisions. The key insight of the course is that correlation does not imply causation and therefore cannot measure impact. In this class, we will learn about A/B testing and other causal methods, as well as how to implement them in business, economic, and policy situations. 3 credits.

DAT 560G Database Design and SQL

Databases are at the foundation of every organization's information strategy. Understanding the structure of databases and mastering the tools to analyze data are essential skills in any role. The tools developed in this course assist students in implementing a company's data management strategy and developing well-grounded analytical recommendations. In this course, we focus on understanding how data is structured in relational databases. With vast amounts of data available, from disparate sources, effective organization of the data is essential to its utilization. To complement this, we utilize SQL (Structured Query Language) as the primary tool to extract data for managerial reports and for advanced analytical models. Practical experience with current relational database software is developed throughout the course. This course is required for MS/CA students and priority will be given to SMP students. 1.5 credits.

DAT 560M Big Data and Cloud Computing

The growth in available data is a challenge to many companies. This presents an opportunity for companies to conquer the vast and various data available to them. The growth in data includes traditional structured data, as well as unstructured data created by both people and machines. It is essential for analysts to be comfortable in the new technologies and tools that are being developed to store, retrieve, analyze, and report, using the vast data resources available. This course introduces students to the technologies currently deployed to overcome the challenges of Big Data. Prerequisite: MGT 560G. 1.5 credits.

DAT 560N Introduction to Cybersecurity

This course covers a broad range of cyber security terms, definitions, perspectives, concepts, and current trends with a focus on managing risk and the use of information and cyber security as business enablers. Students will complete a cybersecurity analytics-related project as part of the coursework. 1.5 credits.

DAT 561 Introduction to Python and Data Science

This is a 3-credit course offered to MSBA students. It provides students the necessary skill set to extract reliable insights from large datasets prevalent in various business applications, such as supply chain management, marketplace operations, healthcare analytics and financial engineering, using Python. In this course, students will develop basic tools to understand Python programs and implement data processing pipelines using Python. In particular, students will learn how to acquire, clean, analyze and visualize data in Python, which they will then use to improve decision-making processes. Throughout the course, students will use the Python programming language, which is very effective for data manipulation, reporting, and complex optimization. Topics covered include introduction to Python programming, data acquisition and cleaning, data manipulation, current multi-source data collection technology used in practice, basic data visualization using Matplotlib, ggplot2 and Bokeh. 3 credits.

DAT 562 Text Mining

Consumers and companies constantly generate large amounts of unstructured or lightly structured texts on the web and offline: exchanges of consumer opinions on products and services on social media, transcripts of phone conversations with customer representatives, open-ended surveys, etc. By employing text analytics, businesses can derive at scale valuable insights into consumer attitudes to brands, competitive landscape, and customer relationships, among other applications. This course introduces students to the methods of mining, organizing, summarizing, and analyzing textual data with the objective of driving business decision-making. 1.5 credits.

MGT 560F Professional Business Communication

Communication is the process of sending and receiving messages, however, communication is effective only when the message is understood and when it stimulates action or encourages the receiver to think in a new way. This course will introduce students to fundamental best practices in business writing and business speaking that will ensure effective communication. Students will participate in activities that will develop professional business communication skills in both writing and speaking. These will include: preparing, writing and delivering presentations, composing clear concise business messages in a variety of formats, understanding emotional intelligence to reach the audience and utilizing critical thinking as a basis for communication strategies. 1.5 credits.

Required Track Courses

FIN 5203 Financial Management

Students will learn in this class how the decisions of a company affect shareholder value and what decisions can increase it. To understand the perspectives of shareholders, we will study basic principles of investing: time value of money, valuation of debt and equity securities, discounted cash flow as a foundation for stock prices, the impacts of diversification and leverage on portfolio risk, the relationship between risk and expected return in securities markets, and capital market efficiency. We will use these principles to analyze capital investment decisions by estimating cash flows and discounting them at the appropriate cost of capital. We will also study how shareholder value is affected by a firm's financing decisions, such as the choice of using debt or equity capital. 3 credits.

FIN 524 Options & 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. Provides both binomial tree and Black-Scholes models for option valuation. 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 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 550F Financial Technology – Methods and Practice

This course is offered to MSA students in the FinTech track. The course will provide an overview of financial technology and will cover specific topics in this area. Topics covered include data-driven credit modeling, crypto currencies, digital wallets and blockchains, smart contracts, robo advising, high-frequency trading, crowd funding, and peer-to-peer lending. The course will also discuss regulatory aspects of FinTech. The course will cover different methods as well as practical applications. 3 credits.

FIN 560G Seminar in Financial Technology

This course is offered to MSA students in the FinTech track. The course will provide students with an opportunity to delve deep into one aspect of financial technology and write an extensive paper on this topic. The paper needs to include an analytical component and may be either a research paper analyzing data and testing some hypotheses related to financial technology or an in-depth case study of a FinTech company or technology and their implications. Other topics may also be considered with the instructor's approval. 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 only eligible to participate in 1 Practicum Course per semester, if selected. PREREQUISITES: You must apply for Practicum projects. Students are notified when projects are available. 3 credits.

Electives

DAT 537 Data Analysis, Forecasting and Risk Analysis

This course presents a modern and contemporary coverage of several econometric models that are used for the analysis and forecasting of business data. The basic building blocks for the analysis are regression time series models. Broad coverage of non-seasonal and seasonal ARIMA models is included. The important family of ARCH-GARCH models, used to represent changing volatility, are also covered in detail. These models are widely used in option pricing and in other financial applications. The course includes some extensions of these models to multivariable problems. Students are exposed to numerous real data sets in class and in assignments. All the models are analyzed with a popular econometrics software package that is employed in business. A group project is required. 3 credits.

FIN 500W Venture Capital Methods

This course provides basic terminology and tools used in evaluation of early-stage venture investing. The course will also cover the history of venture capital and discuss the different strategies that a venture capital firm could utilize. The course will use case studies and outside speakers to provide overviews of certain aspects of the venture capital industry including investment strategies and VC firm operations. Note: Graduate Business Master Students only. 1.5 credits.

FIN 500X Venture Capital Practice

This course is the capstone for students interested in early stage investing. The course objective is to develop practical skills for angel and early-stage investing in private companies. Students will partner with professional investors in the St. Louis community to perform various activities, including finding deals, performing evaluations of investment opportunities, and where appropriate negotiating, arranging financing, and closing investments. The course also relies on bringing in investment professionals from the local community to provide real-world perspective on early stage investing. PREREQ: Venture Capital Methods and instructor approval 1.5 credits.

FIN 500Y Private Equity Methods

This course will provide the student with an understanding of the basic terminology, due diligence and analytical methodologies critical to evaluating Private Equity investments. The course will also cover the history of Private Equity and the different roles of Private Equity – growth capital, LBO / MBO, Roll-Up, etc. in the evolution of the firm. Private Equity funds in the context of the overall market (strategic vs. financial acquirers) will be discussed as will be the role of leveraged lending and bank financing of financial sponsors. Private Equity as an investment and its role in portfolio construction will be analyzed. Finally, the legal structure of Private Equity funds in the context of firm control and governance will be reviewed. 1.5 credits.

FIN 500Z Private Equity Practice

This course is the capstone for students interested in pursuing careers in private equity. Students will develop practical skills for investing in private companies. Students will partner with professionals in the St. Louis community to perform various activities, including transaction sourcing, evaluating investment opportunities and, where appropriate, negotiating, arranging financing, and closing investments. The course also heavily relies on bringing in professionals from the local community to provide real-world perspectives on private equity investing. Prerequisite: FIN 500Y. 1.5 credits.

FIN 523B Mergers & 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 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 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 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 Valuing Strategic Corporate Investments

The objective is to obtain both an in-depth understanding of the real option theory and the associated implementation skills in real-world applications. The theoretical tools are binomial models and Monte Carlo simulations. The application topics cover all types of typical real options, cases of leasing, R&D, take-over, market expansion, growth values, dot-coms, staged investments, multiple project uncertainties, ranging from standard European and American options to compound and rainbow options. 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 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 549H 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. Additional topics related to real estate finance are covered in Fixed Income Securities (FIN 525). 1.5 credits.

FIN 550C Endowments, Foundations & Philanthropy

The course will cover topics in endowment and foundation governance, grant making and investment management as well as fundamentals of philanthropic giving at both the foundation and personal levels. Topics covered include investment policy statements, spending policies, portfolio construction, giving priorities, socially-responsible / environmental-social-governance investing, impact investing, program related investments, and tax considerations. 1.5 credits.

FIN 550D Hedge Fund Strategies

This course provides both an overview of hedge funds and an in-depth analysis of their trading strategies. Topics covered include structure, incentives, and performance evaluation of hedge funds, regulatory and taxation aspects of hedge funds, common trading strategies of hedge funds (e.g., market neutral, global macro, forex, activism, and event driven), and the academic evidence on the performance and influence of hedge funds. Prerequisite: FIN 532 or instructor's approval. 1.5 credits.

FIN 550E Behavioral Finance

The course will cover topics in behavioral finance, which is a field of finance applying psychology to decisions of investors and corporate managers. Topics covered include prospect theory and non-expected utility preferences, behavioral biases and heuristics, limits to arbitrage, anomalies and their behavioral explanations, bubbles and their behavioral explanations, behavioral biases of individual vs. professional traders, and behavioral corporate finance. The course will cover theoretical aspects, empirical and experimental evidence, as well as practical implications. Prerequisite: FIN 532 or instructor's approval. 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.

MGT 511A Law & 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.