

FINANCE (FNCE)

FNCE 401. Financial Orientation. 1.5 Unit.

This is a mandatory preparatory/refresher course for all entering Master of Finance students. It will cover basic topics in statistics, financial accounting and in financial management, so that all students can hit the road running with the other core courses in the first semester. Prereq: For Master of Finance students only.

FNCE 403. Corporate Financial Technology. 3 Units.

This course is focused on the many aspects of the development in Financial Technology from recent notable successes to the current edge and thoughts about the future. Topics covered will include "FinTech" Applications, Incubators and Angels, Block Chains, Crypto-currencies, Crowdfunding, and Payment Schemes. Topics can change from semester to semester, in tune with changing technology. Offered as BAFI 403, FNCE 403 and FTEC 403. Prereq: For Master of Finance, or Financial Management, or Advanced Financial Management certificate students.

FNCE 403C. Financial Management. 1.5 Unit.

Serves as a prerequisite for several advanced electives in banking and finance. Its purpose is to familiarize the student with the theory and application of models used in financial decision-making by corporations. Issues relating to efficient markets, financing decisions, capital budgeting, risk and return, and securities valuation are among the topics considered. Prereq: For Master of Finance students in Shanghai, China

FNCE 404. Financial Modeling. 3 Units.

This is a course about financial modeling. It covers a range of topics in the field of financial economics. Each topic is chosen because it lends itself to financial modeling. The primary focus of the course is to relate the theory of finance to practical and usable spreadsheet models that will assist a financial manager with a firm's investment and financing decisions. Spreadsheet models have been the dominant vehicle for finance professionals to practice their trade. This course will utilize Excel and challenge the student to improve their finance and modeling skills. Students will improve their familiarity with financial data analysis through various exercises that incorporate completed models. In summary, the course is designed to increase your practical understanding of core concepts in finance, help you develop hands-on spreadsheet modeling skills, and strengthen your ability to perform financial data analysis within an Excel model. Prereq: For Master of Finance, Financial Management certificate, or Quantitative Finance certificate students.

FNCE 404C. Financial Modeling & Value. 1.5 Unit.

Firms try to create value. In their day-to-day operations, they are faced with numerous challenges: Should we accept trade credit or borrow? Will an acquisition create or destroy value? Should we introduce a new product line even if it cannibalizes an existing one? In each of these situations they try to quantify the impact on the value of their firm. The goal of this course is to develop your skills in financial modeling and valuation, so you can tackle issues like the ones described above. The course is designed to be "hands-on": You will learn to apply the theory and develop spreadsheet modeling skills through homework, case studies and a group project. By the end of the course you will have a good understanding of both the theory and practice of valuation, and possess a set of cutting-edge financial modeling skills. This course is designed for students who aspire to work in a regular company, a bank or a consulting firm in (i) corporate finance (including mergers and acquisitions); (ii) strategy; or (iii) equity analysis. Prereq: For Master of Finance students in Shanghai, China

FNCE 411. Handling Financial Big Data with Python. 1.5 Unit.

Python has emerged as the preferred language for building Artificial Intelligence models, a key enabler technology in Fin Tech. Accordingly, Python will also be the language that relevant FinTech courses in our program may employ. This preparatory course introduces participants to the basics of the Python programming language. By carefully choosing examples and case studies from the field of Finance, this course also provides students an early experience of how Python is used in the Finance industry. Offered as FNCE 411 and FTEC 411.

FNCE 412. Algorithmic Trading. 3 Units.

Finding the right algorithm to automatically and successfully trade in financial markets is the holy grail in finance. Not too long ago, Algorithmic Trading was only available for institutional players with deep pockets and lots of assets under management. Recent developments in the areas of open source, open data, cloud computing and storage, as well as online trading platforms, have leveled the playing field for smaller institutions and individual traders - making it possible to get started in this fascinating discipline being equipped with a modern notebook and an Internet connection only. Coding experience required or consent of instructor required. This course aims to: - Trace the evolution of quantitative trading strategies and hedge funds - Expose students to the landscape of datasets (both Reference Data and Market Data) - Discuss univariate time series models and multivariate time series models - Introduce select advanced ideas such as volatility models and optimal execution algorithms - Evaluate the performance of these trading strategies - Provide a comprehensive overview of news analytics Offered as BTEC 412, FNCE 412, and FTEC 412.

FNCE 414. Banking and RegTech. 3 Units.

The FinTech revolution is creating significant disruption to the traditional processes of managing and regulating banks. FinTech is also changing the way financial services and products are delivered. Investors still pour billions of dollars into new FinTech startups each year. Some commentators foresee a revolution in finance, where there will be no need for brick and mortar banks, or even physical money itself. The reality is likely to be a more gradual adoption and integration of innovative technology and mobile applications into the existing financial system. The big financial institutions are not going to go away. They will adapt. This course will: -Enable students to critically examine new Fin Tech services within the context and framework of traditional money, banks, and regulation. -Understand, assess and forecast FinTech's impact on banking. This is particularly important because proper management and oversight of financial institutions is essential to the efficient operation of the economy. -Explore RegTech and the various channels through which RegTech adds value to financial institutions. Offered as FNCE 414 and FTEC 414. Prereq: For Master of Finance students only.

FNCE 415. FinTech and Entrepreneurship. 3 Units.

Globally, the number of FinTech unicorns is growing. FinTech unicorns are start-ups that are privately owned and whose valuation exceeds \$1 bn. In this course, students will take on the role of a FinTech entrepreneur and learn how to: -Identify new opportunities, -Design new products, and -Evaluate the product-market fit. The course also introduces the various financing options that are available to a Fin Tech start-up at various stages of its lifecycle. Offered as FNCE 415 and FTEC 415.

FNCE 416. Managing Massive Financial Datasets. 1.5 Unit.

Several key breakthroughs in the field of banking and finance have been made on the basis of analyzing massive data sets. The goals of this course are to: - Familiarize students with key technologies used in organizing, accessing and manipulating big data in finance. - Expose students to basic platforms such as Hadoop, and to data storage techniques. - Demonstrate the power of data visualization for financial problems. Offered as FNCE 416 and FTEC 416.

FNCE 421. Corporate Financial Analysis. 3 Units.

This course is designed to lay the analytic foundation for careers in corporate finance, banking, consulting, and investment banking. The objective of the course is to strengthen students' conceptual understanding and problem-solving skills, and teach them how to think on their feet. Topics covered include Economic cash flows and valuation, Valuation methods, Long term financial planning and ratios analysis, Growth and external financing, Managerial options and valuation, Capital structure, and Payout policy. Topics covered may change from semester to semester. The course envisages use of spreadsheets and case studies, and will emphasize on links to real-world events. Prereq: For Master of Finance, Financial Management certificate, or Quantitative Finance certificate students.

FNCE 428. Financial Strategy and Value Creation. 3 Units.

The intersection between the theory of perfect markets and the reality of market imperfections provides the basis for the exploration of value creation in this course. Opportunities in both product and financial markets are explored using case studies to develop a framework for strategic financial decisions. Prereq: For Master of Finance, Financial Management certificate, or Advanced Financial Management certificate students.

FNCE 428C. Financial Strategies and Value Creation. 1.5 Unit.

The intersection between the theory of perfect markets and the reality of market imperfections provides the basis for the exploration of value creation in this course. Opportunities in both product and financial markets are explored using case studies to develop a framework for strategic financial decisions. Prereq: For Master of Finance students in Shanghai, China

FNCE 429. Investment Management. 3 Units.

This course explores the characteristics of financial investments and markets and develops modern techniques of investment analysis and management. The goal is to help students develop a level of analytical skill and institutional knowledge sufficient to make sensible investment decisions. Topics include: an overview of stock, debt and derivative asset markets, practical applications of modern portfolio theory, equilibrium and arbitrage-based approaches to capital market pricing, the debate over market efficiency, the term structure of interest rates, bond portfolio management, and uses of derivative assets in investment portfolios. Prereq: For Master of Finance or Financial Management certificate students.

FNCE 429C. Portfolio Management and Asset Allocation. 3 Units.

This course explores the characteristics of financial investments and markets and develops modern techniques of investment analysis and management. The goal is to help students develop a level of analytical skill and institutional knowledge sufficient to make sensible investment decisions. Topics include: an overview of stock, debt and derivative asset markets, practical applications of modern portfolio theory, equilibrium and arbitrage-based approaches to capital market pricing, the debate over market efficiency, the term structure of interest rates, bond portfolio management, and uses of derivative assets in investment portfolios. Prereq: For Master of Finance students in Shanghai, China

FNCE 430. Derivatives and Risk Management. 3 Units.

This course is intended to give students an understanding of options and futures markets both in theory and practice. The emphasis is on arbitrage and hedging. The course concentrates on listed common stock and index contracts as well as commodity markets. Various theories for trading strategies are studied. Prereq: For Master of Finance or Quantitative Finance certificate students.

FNCE 430C. Derivatives Markets and Models. 3 Units.

This course is intended to give students an understanding of options and futures markets both in theory and practice. The emphasis is on arbitrage and hedging. The course concentrates on listed common stock and index contracts as well as commodity markets. Various theories for trading strategies are studied. Prereq: For Master of Finance students in Shanghai, China

FNCE 431. Fixed Income Markets and Their Derivatives. 3 Units.

This class is concerned with fixed income securities, interest rate risk management, and credit risk. Fixed income securities account for about two thirds of the market value of all outstanding securities, and hence this topic is important. The course covers the basic products of fixed income markets including treasury and LIBOR products, such as interest rate swaps. Risk management and hedging strategies are covered as well as selected topics in credit risk models and mortgage-backed securities. Prereq: For Master of Finance or Advanced Quantitative Finance certificate students.

FNCE 431C. Fixed Income Markets and Models. 1.5 Unit.

This class is concerned with fixed income securities, interest rate risk management, and credit risk. Fixed income securities account for about two thirds of the market value of all outstanding securities, and hence this topic is important. The course covers the basic products of fixed income markets including treasury and LIBOR products, such as interest rate swaps. Risk management and hedging strategies are covered as well as selected topics in credit risk models and mortgage-backed securities. Prereq: For Master of Finance students in Shanghai, China

FNCE 432. Corporate Risk Management. 3 Units.

This is a risk management course aimed at participants who wish to enhance their understanding of the risks faced by corporate firms, both financial and non-financial, learn techniques to identify and measure these risks, and understand how derivatives and risk management solutions can be used to manage these risks, create value, and advance the strategic goals of the firm. Offered as BAFI 432 and FNCE 432. Prereq: For Master of Finance students only.

FNCE 432C. Corporate Risk Management. 1.5 Unit.

This is a unique strategic risk management course aimed at participants who wish to enhance their understanding of the risks faced by corporate firms, both financial and non-financial, learn techniques to identify and measure these risks, and understand how derivatives and risk management solutions can be used to manage these risks, create value, and advance the strategic goals of the firm. The course is designed in a manner such that it would be of use to executives of all corporations, financial and nonfinancial, across all functional areas. Prereq: For Master of Finance students in Shanghai, China

FNCE 433. Quantitative Risk Modeling. 3 Units.

This course is designed to help students learn quantitative models for estimating risk in various financial settings for different types of financial institutions (banks, hedge funds, and others). It is a very hands-on course where students will become familiar with several state-of-the-art quantitative risk models as well as their detailed implementation procedure in the real world. The course uses several in-class Excel exercises to illustrate the models as well as their practical implementation using real financial data. Offered as BAFI 433 and FNCE 433. Prereq: For Master of Finance or Advanced Quantitative Finance certificate students.

FNCE 433C. Quantitative Risk Modeling. 3 Units.

This course exposes students to state-of-the-art quantitative techniques in risk modeling. The course covers the analytical as well as simulation based implementation of different types of risk models using Excel, including several Value-at-Risk (VaR) models. It also covers volatility modeling, correlation estimation, extreme value theory, back-testing, and stress testing of risk models. This course is for Master of Finance (China) students. Prereq: For Master of Finance students in Shanghai, China

FNCE 434. Financial Analytics and Banking. 3 Units.

This course will cover empirical and analytical aspects of banking, including loan origination, syndication, sales, stress-testing and securitization; capital adequacy, regulation and supervision; methods of measuring and managing value at risk, credit risk, interest rate risk, liquidity risk, and other risk; credit market information, feedback, and signaling. Offered as BAFI 434 and FNCE 434. Prereq: For Master of Finance or Advanced Quantitative Finance certificate students.

FNCE 434C. Financial Econometrics. 3 Units.

This course represents a rigorous study of the latest developments in the area of financial econometrics. It assumes that you have had a basic statistics class and that you have had regression analysis. It is taught using economic motivations and examples from the financial world. The course concerns modern econometric topics like time-series forecasting, volatility modeling, and panel data analysis. Various concepts and approaches in the course will be subjected to real world data. Students are expected to have basic knowledge of the fundamentals of corporate finance and statistics. The course aims at providing a lasting conceptual framework for model building using modern applied econometric techniques commonly employed in finance. Prereq: For Master of Finance students in Shanghai, China

FNCE 435. Empirical Finance. 3 Units.

This course provides an introduction to empirical analysis and research in finance. This involves the management of empirical datasets and the aspects of quantitative applications of finance theory. The goal is to enable the student to deal with the need to analyze complex and large financial and economic datasets that is present in many fields of the financial profession. The scope of the data as well as the quantitative methods used in such analysis often requires familiarity with robust computational environments and statistical packages. As such, another goal of the course is to familiarize the student with at least one such environment. Applications are conducted using real financial and economic data. The course draws on the theoretical aspects of the subjects covered, but mainly focuses on the practical matters required to undertake an empirical analysis of financial topics—e.g., the definition of the research question, the datasets required, the computational needs, and, then, the implementation. The course enables the student to evaluate outstanding financial research as well as to conduct his or her own research. Offered as BAFI 435 and FNCE 435. Prereq: For Master of Finance or Quantitative Finance certificate students.

FNCE 436A. Individual, Team and Career Development. .75 Unit.

This course is designed to focus on three areas of development critical to students' personal and professional success: 1) Individual; 2) Team; and 3) Career. The individual and team aspects include developing self and other awareness through exploration of learning styles, process skills, and building communication and presentation competencies. Career development includes a focus on strategies for success such as networking, resume building, and learning from executives through intensive and interactive seminars. The course involves use of assessments, group discussions, presentations and experiential activities. Prereq: For Master of Finance students only.

FNCE 436B. Individual, Team and Career Development. .75 Unit.

This course is designed to focus on three areas of development critical to students' personal and professional success: 1) Individual; 2) Team; and 3) Career. The individual and team aspects include developing self and other awareness through exploration of learning styles, process skills, and building communication and presentation competencies. Career development includes a focus on strategies for success such as networking, resume building, and learning from executives through intensive and interactive seminars. The course involves use of assessments, group discussions, presentations and experiential activities. Prereq: For Master of Finance students only.

FNCE 436D. Individual, Team, and Career Development. 0 Unit.

This course is designed to focus on three areas of development critical to a student's personal and professional success: individual, team, and career development. This will be accomplished through a project with a company so that students get a real-life experience related to their field of study. This experience provides students with the opportunity to explore their career interests while applying knowledge learned in the classroom in a real-life setting. The experience also helps students build their professional networks and be part of a team assigned to work on the corporate project. Prereq: For Master of Finance students only.

FNCE 440. Financial Decisions Modeling and Analytics. 3 Units.

The firm is a nexus of contracts among its various stakeholders (e.g., managers, shareholders, debt holders). In this course, we will examine Valuation, Quantitative Analysis of Real Options, Asymmetric Information, Agency Cost, Incentive Contracts and Performance Metrics, Regulation and Reputation. The takeaway learnings from this course are: (a) Understanding how value can be created or destroyed, (b) Measuring/quantifying value using financial big data, (c) Understanding the links between capital structure and asymmetric information, market reactions and signaling, agency and management incentives, taxes and shareholder, bondholder conflicts, (d) Understanding the links between payout policy and informational content, market reaction, stock returns and signaling, and clientele effects, and (e) design of Performance Metrics. We will download corporate financial data (financial big data) from research databases, and conduct empirical analysis to understand the value implications of financial decisions. Excel/SAS will be used. We will analyze case studies and real-world events. Prereq: For Master of Finance students only.

FNCE 440C. Financial Decisions, Contracting and Value. 1.5 Unit.

This course exposes the students to in-depth treatment of topics that include investment decisions, financing decisions, payout decisions, contracting decisions and performance metrics, internal control systems, risk management, real options, diversification and valuation. Topics covered may vary from semester to semester. Prereq: For Master of Finance students in Shanghai, China

FNCE 441AC. Global Banking and Capital Markets I. 1.5 Unit.

This course will expose students to Banking and Capital Market Structure, Practices, and Regulations. Topics covered include the financial services industry, especially commercial banking and investment banking, regulatory framework, market reactions to various corporate events, understanding risk, the return demanded by investors, activists involvement in target firms, and market reactions to such events. Several case studies are used to expose students to different issues and questions that arise in the day-to-day jobs of financial managers in this industry. Prereq: For Master of Finance students in Shanghai, China

FNCE 441BC. Global Banking and Capital Markets II. 1.5 Unit.

This course will expose students to Banking and Capital Market Structure, Practices, and Regulations. Topics covered include the financial services industry, especially commercial banking and investment banking, regulatory framework, market reactions to various corporate events, understanding risk, the return demanded by investors, activists involvement in target firms, and market reactions to such events. Several case studies are used to expose students to different issues and questions that arise in the day-to-day jobs of financial managers in this industry. Prereq: For Master of Finance students in Shanghai, China

FNCE 444. Entrepreneurial Finance. 3 Units.

The objective of this course is to introduce students to the issues of financial management and capital formation in new ventures. The course will address issues of estimation of cash requirements, development of pro forma financial plans, firm valuation and the process and tools used in raising debt and equity financing. Bootstrapping, angel investing, venture capital, strategic alliances and initial public offerings will be covered. The emphasis is on the entrepreneur and how he/she can assess financial needs and develop a sensible plan for acquiring financial resources in a manner that is consistent with their financial needs and other strategic goals. Offered as BAFI 444 and FNCE 444. Prereq: For Master of Finance or Financial Management certificate students only.

FNCE 450. Mergers and Acquisitions. 3 Units.

This course examines the economic rationale and motivation for the different merger and acquisition and recapitalization activity undertaken by firms and individuals in the U.S. market. Emphasis is on the different three (3) methods of valuing a firm, the various forms of debt and equity capital employed to fund mergers and acquisitions and recapitalizations, how lenders and investors structure their loans and/or investments, and how investors realize the gains through different exit strategies. The course gives the student an excellent understanding of the role that senior commercial banks, insurance companies, pensions funds, LBO funds, investment banking firms, and venture/growth capital investors play in mergers and acquisitions. Prereq: For Master of Finance, Financial Management, or Advanced Financial Management certificate students.

FNCE 450C. Corporate Valuation and M&A Restructuring. 1.5 Unit.

This course examines the economic rationale and motivation for the different merger and acquisition and recapitalization activity undertaken by firms and individuals in the U.S. market. Emphasis is on the comparable publicly traded proxy company, comparable "change of control" transaction, and discounted cash flow methods of valuing a firm. The class will also review the different types of debt and equity capital employed to fund mergers and acquisitions and recapitalization, how senior lenders and equity investors structure their loans and/or investments, and how investors realize the gains through different exit strategies. The legal and tax ramifications of various forms of M&A activity are also discussed. The course gives the student an excellent understanding of the role that senior commercial banks, insurance companies, pensions funds, LBO funds, investment banking firms, and venture/growth capital investors play in mergers and acquisitions and will strengthen the students' ability to value a business enterprise. Prereq: For Master of Finance students in Shanghai, China

FNCE 455C. A Foundation in Basic Concepts of Innovations and Applications for Financial Technology. 3 Units.

Over last few years, field of finance has experienced a burst of technological advances that have disrupted and transformed traditional methods of accessing, allocating, and transferring capital. Understanding the evolution of traditional finance methods is increasingly important for finance students so they can meaningfully distinguish advantages and disadvantages of traditional versus emerging methods and models. Main objective of course is to provide foundation in basic concepts of these innovations and their applications. It is this collective financial technology focus that has garnered the name of FinTech. This course will cover many aspects of FinTech proliferation, from notable successes to current innovations and thoughts about future opportunities. Topics will include FinTech applications, blockchains, cryptocurrencies, crowdfunding, payment systems and trading technology. This list may change from semester to semester, in tune with changing technology and as business models become disrupted. Prereq: For Master of Finance students in Shanghai, China

FNCE 460. Investment Strategies. 3 Units.

This course provides a broad survey of some of the main strategies used by hedge funds today. Through exercises and projects, the hedge fund strategies will be presented using real data. Students will learn to use a methodology referred to as "back testing" in order to evaluate hedge fund strategies. The course will also cover institutional details related to short selling, liquidity, margin requirements, risk management, and performance measurement. Since hedge funds today use advanced modeling techniques, the course will require students to analyze and manipulate real data using mathematical modeling. The objective of the course is for students to gain practical knowledge about creating, back-testing, and implementing hedge fund trading strategies. Offered as BAFI 460 and FNCE 460. Prereq: For Master of Finance students only.

FNCE 460C. Investment Strategies. 1.5 Unit.

The class describes some of the main strategies used by hedge funds and provides a methodology to analyze them. In class and through exercises, the strategies will be illustrated using real data and students will learn to use "back testing" to evaluate a strategy. Throughout the semester, we will discuss the economics underlying these strategies and we will analyze why certain strategies might work and why others might not. The class also covers institutional issues related to short selling, liquidity, and performance measurement. The class is fairly quantitative. As a result of the advanced techniques used in state-of-the-art hedge funds, the class requires the students to work hard, analyze and manipulate real data, and use mathematical modeling. Prereq: For Master of Finance students in Shanghai, China

FNCE 470. Financial Models Using Big Data. 3 Units.

This course is focused on developing models in investments using financial big data. A strong theoretical base will be developed and then relevant empirical analyses using real data will be used for testing models, via individual assignments and group projects. In the projects, groups of students will be immersed in collecting, analyzing, and interpreting financial big data sets. Prereq: For Master of Finance students only.

FNCE 471. Applications in Financial Big Data. 3 Units.

This course is project-based and focused on solving real-life problems using financial big data. Groups of students will collect/use data, estimate parameters, and conduct appropriate validation tests. Not only do the members have to work together, but they also have to be professional, make interim reports, and communicate effectively with each other. Prereq: For Master of Finance students only.

FNCE 480. Global Banking & Capital Markets. 3 Units.

This course will expose students to Banking and Capital Market Structure, Practices, and Regulations in North America, Europe, as well as Asia. Students will learn about structure of the financial services industry in different parts of the world, the history and evolution of the regulatory frameworks in this industry, and its consequent impact on financial and economic development as well as risk. Several case studies are used to expose students to different issues and questions that arise in the day-to-day jobs of financial managers in this industry. Offered as BAFI 480 and FNCE 480. Prereq: For Master of Finance students only.

FNCE 480C. International Finance. 1.5 Unit.

This course introduces students to international finance and foreign exchange risk management by corporations. Topics include foreign exchange markets and international financial institutions; fx contracts; exchange rate risk and corporate risk management; and international aspects of long-term financing. Prereq: For Master of Finance students in Shanghai, China

FNCE 490. Cases in Applied Corporate and Real Estate Valuation. 3 Units.

This course is focused on engaging groups of students in identifying, analyzing and making decisions on real-world corporate financial problems. Teams of students will be assigned to a specific client situation drawn from one of four general areas: (i) mergers and acquisitions (involving corporations and/or leveraged buyout firms), (ii) public equities (IPOs and/or equity research), (iii) corporate financial policies and transactions or (iv) real estate. Learning will include lectures, structured problem solving using live case studies and an in-depth project in which will evaluate an actual current business opportunity and present it to a panel of industry veterans. In addition to learning deeper financial skills, the course will enhance unstructured problem solving, project management, team building and high level communications skills. Offered as BAFI 490 and FNCE 490. Prereq: For Master of Finance students only.

FNCE 491. Python Programming w Appl in Finance. 3 Units.

There are two parts to this course. (i) In the first part we learn the basics of Python programming language by solving a sequence of rather simple problems each focusing on broadening your knowledge. At each stage we introduce important commands of Python and slowly learn the structure of object oriented programming with Python. The objective is to make you Python literate. (ii) The second part of the class is for you to tackle significant financial problems either in risk management or in corporate finance using the Python language as the primary tool to do the analysis. You will develop a series of financial models in your track and then tackle two major projects which will utilize all the skills developed. Offered as BAFI 491 and FNCE 491. Prereq: For Master of Finance students only.

FNCE 493. Blockchains, Cryptocurrencies, and Cryptoventures. 3 Units.

It behooves today's business leaders to be well acquainted with blockchain technologies and AI, two seemingly disparate technologies that have the potential to fundamentally disrupt a wide range of businesses. The popularity of blockchain technologies has increased exponentially since the release of bitcoin in 2009. While bitcoins garnered a lot of attention during the initial days, the focus has shifted over time to the underlying technology: blockchain. This wildly innovative technology has made possible tasks that were hitherto deemed implausible: validate ownership in a digital asset, verify the true state of a transaction without relying on a costly intermediary etc. Accurate predictions and sound judgements are two critical ingredients of any decision making process. While the jury is still out on whether algorithms can make sound judgements, recent developments in a field called machine learning (and its sub-field, deep learning) have led to dramatic improvements in the accuracy of predictions made by these algorithms. Significantly, this gain in accuracy has been accompanied by a reduction in overall costs. These in turn have spurred the recent interest in AI. Organizations that have enabled AI at the enterprise level appear to be making more informed decisions and innovating new products. In this course, we will unpack these technologies and examine a wide range of relevant business use cases. Our objective is to provide a practical introduction to these key technologies and their business implications. We focus on business perspectives, rather than on the technical dimensions. Fittingly, this course is open to all graduate students of Weatherhead School (MBA and all specialty Masters). Students are not expected to have any specific programming background; however, a basic understanding of statistics is required to better appreciate the discourse on Artificial Intelligence. Offered as BTEC 493, FNCE 493 and FTEC 493. Prereq: For Master of Finance students only.

FNCE 494. Artificial Intelligence for Financial Modeling. 3 Units.

This is a hands-on course on Artificial Intelligence (A.I.) where the emphasis is not only on understanding the theoretical underpinnings of various AI models but also on building, evaluating, and critiquing A.I. models as they apply to the finance industry. This course begins with an introduction of Machine Learning models; various key ideas such as bias-variance tradeoff, cross-validation, regularization techniques are introduced with relevant examples from Finance. The course then proceeds to discuss Artificial Neural Networks and its relevance to Deep Learning. Foundational ideas such as back-propagation are discussed in sufficient detail; we also lay a lot of emphasis on evaluating the performance of all these models. A key objective of this course is help students build cutting-edge A.I. models that are ready for prime time, i.e., real-life applications. Fittingly, we work with several real-life datasets and case studies from banking and finance. We will work with three case studies, each of which span multiple sessions. -In the first case study, students use Machine Learning algorithms to understand how imbalanced datasets are handled in real-life. -In the second study, students use time series data and learn not only about the power of regularization techniques but also to highlight the prominence of A.I. in financial markets. -In the third case study, students learn how to use cutting-edge Deep Learning models to extract sentiments from disparate news sources; these are in turn used to generate trading strategies. By contrasting the effort that goes into and the payoff obtained from Machine Learning and Deep Learning models, students gain an intuitive appreciation of both these classes of models. Offered as BTEC 494, FNCE 494 and FTEC 494. Prereq: For Master of Finance students only.