BUSINESS PH.D. (BPHD)

BPHD 0001. Year 1 Comprehensive Exam. (0 Credits)
The Year 1 comprehensive exam is a written exam designed to measure a student's fundamental understanding of business, with an emphasis on economics, management, and quantitative and empirical methods.

BPHD 0002. Year 2 Comprehensive Exam. (0 Credits)
The Year 2 comprehensive exam is a written field exam. Students work with advisers to determine two appropriate reading lists at the end of Year 1 and read for the exam during Year 2. The field exam measures knowledge of the field(s) and determines readiness to move on to the dissertation phase.

BPHD 0003. Year 2 Paper. (0 Credits)
At the conclusion of Year 2, students present a paper to the faculty during a doctoral program workshop. The paper may be an extension of a course paper or a research paper pursued independently. This paper provides an opportunity for students to build presentation and workshop skills, and should ideally serve as an eventual component of the dissertation.

BPHD 0004. Dissertation Proposal Acceptance. (0 Credits)
Students defend their dissertation proposal to their prospective dissertation committee at the conclusion of Year 3.

BPHD 0005. Dissertation Defense. (0 Credits)
The dissertation is a large-scale, closely supervised research project typically consisting of three to four article-length papers, preferably along a similar topic, with extensive research, writing, and revision expected. Students offer regular progress updates to their dissertation committee members, who in turn meet with the doctoral program director to ensure sufficient progress. Upon successful completion and defense of the dissertation, students are awarded a Doctor of Philosophy in Business (Ph.D.).

BPHD 8001. Philosophy of Science. (3 Credits)
Provides an understanding of the philosophy, history, theory, and institutions of doctoral-level research in business.
Attribute: BPD1.

BPHD 8002. Research Methods. (3 Credits)
Provides an understanding of the key elements of theory building, research design and methods.
Attribute: BPD1.

BPHD 8003. Intro to Micro & Macro. (3 Credits)
Introduction to micro and macroeconomics.
Attribute: BPD1.

BPHD 8004. Financial Econometrics. (3 Credits)
This course covers estimation of parametric and non-parametric techniques commonly used in finance, applying high-frequency financial databases. We will discuss properties of financial data; linear time-series data analysis; and the basic theory of statistical inference with linear models, general linear models, conditional Heteroskedasticity models, nonlinear models, and Bayesian inference and estimation. Students will develop advanced skills in statistical analysis and will be able to apply econometric methods to financial data. This course will address both advanced empirical research methods and select models of cutting-edge finance theory.
Attribute: BPD3.

BPHD 8005. Empirical Capital Markets. (3 Credits)
Provides an understanding of the key elements of the study of capital markets.
Attribute: BPD3.

BPHD 8006. Data Analysis. (3 Credits)
Provides an understanding of the key elements of contemporary data analysis.
Attribute: BPD1.

BPHD 8007. Econometrics. (3 Credits)
Overview and in-depth analysis of econometrics theory and practice.
Attribute: BPD1.

BPHD 8008. Fundamentals of Acct 1. (3 Credits)
Provides insights into how accounting information can be used by investors and creditors to measure the results of business operations.
Attribute: BPD3.

BPHD 8009. Quantitative Issues in Capital Markets. (3 Credits)
In-depth study of the key quantitative issues in capital markets.
Attribute: BPD3.

BPHD 8010. Raising Capital & Inv in Glob. (3 Credits)
Provides a comprehensive overview of the going-public decision. Examines the strategies and process of corporate restructuring and investing activities, such as mergers and acquisitions, corporate diversification, spin-offs, carve-outs, asset sell-offs, tracking stock, exchange offers, and debt restructuring.
Attribute: BPD3.

BPHD 8011. Seminar in Corporate Theory. (3 Credits)
In-depth study of a variety of topics in corporate theory.
Attribute: BPD2.

BPHD 8012. Quantitative Methods. (3 Credits)
This course provides advanced knowledge of quantitative methods for finance research. The course will consider empirical research and theory side by side. Topics addressed may include descriptive statistics, probabilities, advanced data analysis, hypothesis generation and testing, estimations, variance, linear regressions, and other issues relevant for business modeling.
Attribute: BPD3.

BPHD 8013. Managerial Accounting Analysis. (3 Credits)
In-depth study of managerial accounting analysis.
Attribute: BPD3.

BPHD 8014. Financial Statement Analysis. (3 Credits)
An understanding of financial statements and the information they communicate on the operating, investing and financing activities of corporations. Focuses on the impact of financial accounting principles, disclosure standards and alternative accounting practices on financial reports. Examines and evaluates traditional and non-traditional methods of financial statement analysis.
Attribute: BPD3.

BPHD 8015. Economic Analysis and Business Decisions. (3 Credits)
Presents economic theories to examine business pricing, production, marketing, and profits within different market structures and environments. Topics include: consumer choice and demand; the behavior of firms; market power and structure; the efficiency of competitive markets; externalities and social costs; information and behavior under uncertainty. The course also discusses social costs and benefits of business actions and related ethical and regulatory issues.
Attribute: BPD3.

BPHD 8016. Investment Banking. (3 Credits)
In-depth study of investment banking.
Attribute: BPD3.

BPHD 8017. Seminar in Banking & Finance. (3 Credits)
In-depth study of research questions, theory, and methodology in banking and finance.
Attribute: BPD2.

BPHD 8018. Research in Economics. (3 Credits)
In-depth study of research in economics.
Attribute: BPD3.

BPHD 8019. International Accounting. (3 Credits)
In-depth study of international accounting.
Attribute: BPD3.

BPHD 8020. Empirical Research in Accounting and Capital Markets. (3 Credits)
In-depth study of a variety of topics in accounting and capital markets.
Attribute: BPD3.

BPHD 8021. International Corporate Tax. (3 Credits)
Introduces the complexities of international taxation by focusing on the U.S. tax system's impact on U.S. companies investing or operating abroad and on foreign companies investing or operating in the U.S. Topics include tax treaties, foreign tax credits and controlled foreign operations.
Attribute: BPD3.

BPHD 8022. Web Analytics. (3 Credits)
Web analytics— also referred to as Web metrics, e-Metrics, or e-analytics — is the science of Internet audience measurement and analysis. It deals with the identification, gathering and formatting of Web usage data, the computation and presentation of metrics, and the exploitation of the results, in order to measure website success. Meaningful insight is gained from traffic and visitor analytics data. It not only covers the unique measurement challenges associated with segmentation, but also comes with strategic recommendations for focusing the entire analytics process — from where to begin to what your larger, overall web analytics goals should be (Google Analytics, IBM ShowCase Web Analysis).
Attribute: BPD3.

BPHD 8023. Fixed Income Analysis. (3 Credits)
Introduces techniques for valuing fixed income securities and their derivatives. Emphasizes pricing and risk-measurement for government, corporate and mortgage-backed instruments. Analyzes embedded options using the binomial model. Develops fixed-income trading and portfolio management techniques, including the use of repo, futures, options, swaps and credit derivatives. Examines theory and empirical evidence on the term structure of interest rates, including the derivation of spot and implied forward yield curves.
Attribute: BPD3.

BPHD 8024. Quantitative Issues in Management and Finance. (3 Credits)
This course is dedicated to preparing Ph.D. students for the complex world of modern financial scholarship and practice. We will cover current trends in theoretical and empirical corporate finance and management science, with up-to-date research, literature, and reflection, while providing a solid foundation of the established theory. Students will be exposed to frequent data projects, as well as presentation and discussion of academic literature and the writing of an independent research paper.
Attribute: BPD3.

BPHD 8025. Corporate Finance. (3 Credits)
Studies corporate finance and its specific decisions. Topics include evaluating capital expenditure proposals, forecasting financing requirements and selecting sources of financing. The course also discusses working capital management, dividend policy and contingency planning, and addresses the additional challenges of multinational firms.
Attribute: BPD3.

BPHD 8026. Big Data Analytics. (3 Credits)
This course provides students with an understanding of big data analytics, research, and methods.
Attribute: BPD3.

BPHD 8028. Empirical Research in Accounting: Financial Instruments, and Debt Contracting. (3 Credits)
This course provides advanced knowledge of banking, financial instruments, and debt contracting.
Attribute: BPD3.

BPHD 8029. Empirical Research in Financial Accounting. (3 Credits)
This course provides advanced knowledge of financial accounting.
Attributes: BPD2, BPD3.

BPHD 8030. Macro-Finance. (3 Credits)
This course covers advanced topics at the intersection of macroeconomics, monetary economics, banking, and international finance.
Attribute: BPD3.

BPHD 8033. Financial Accounting. (3 Credits)
Students in this course develop the ability to analyze and interpret financial statements and study the effects of alternative accounting standards and practices on income statements, balance sheets, and statements of cash flows.
Attribute: BPD3.

BPHD 8034. Applied Microeconometrics. (3 Credits)
The primary goal of this course is to improve students' ability to conduct high-level empirical research, combining economics, econometrics, and data. The course will cover instrumental variables estimation, regression discontinuity, propensity score matching, control function approach, randomized control trials, static panel data models, and dynamic panel data models. The course is intended to be particularly useful for advanced Ph.D. students and master's students planning to write or currently writing a thesis. The course will mainly draw on a series of high-quality journal publications from the field of applied microeconomics that use the aforementioned applied econometric techniques for causal inference.
Attribute: BPD3.

BPHD 8035. Seminar in Theoretical Corporate Finance. (3 Credits)
This course considers the theoretical underpinnings of corporate finance, with particular attention paid to the history of corporate finance and contemporary theoretical studies. The course seeks to address the core issues related to funding, capital structure, firm value, and how these abstractions inform our empirical view of corporate finance today.
Attribute: BPD2.

BPHD 8036. Fintech & Machine Learning. (3 Credits)
A comprehensive survey of the tools related to the burgeoning fields of financial technology and machine learning in a business context. The course addresses technology and innovation and their relationship to financial services, as well as the algorithms and statistical models that may be deployed to help build these systems.
Attribute: BPD3.

BPHD 8037. Financial Modeling. (3 Credits)
This course helps students develop the type of Excel-based financial models that businesses use every day to analyze a wide range of financial problems and make decisions. Students deliver written and oral presentations of their models and practice skills critical for a successful career in finance.
Attribute: BPD3.

BPHD 8038. Advanced Corporate Finance. (3 Credits)
This course teaches students the art of applying corporate finance theory, providing them with tools and techniques essential to strategic decision-making in critical real-life situations faced by organizations. The course enhances students' understanding of corporate finance by providing a comprehensive examination of selected advanced topics, such as alternative valuation methods, real options in corporate finance, decision trees, international operations, mergers and acquisitions, risk arbitrage, debt capacity and leveraged buyouts, private equity, warrants and convertibles, and ethical issues.
Attribute: BPD3.

BPHD 8039. Fundamentals of Strategy. (3 Credits)
Students in this course focus on defining an organization's mission, establishing its objectives, developing strategies for achieving those objectives, and assuring implementation and continual updating of long-term plans. This course integrates the knowledge and skills developed in the core courses.
Attribute: BPD.

BPHD 8040. Seminar in Strategic Management. (3 Credits)
This course involves intensive study of strategy, with a focus on theory, research, and methodology. Topics covered may include organizational theory, behavior, sustainability, green technology, energy, business and government relations, nonmarket strategy, and social media. Techniques will include statistical analysis, case study review, and other deep-dives.
Attribute: BPD2.

BPHD 8041. Global Risk Management. (3 Credits)
This course covers market risk and volatility, calculation of vaR (value at Risk), Monte Carlo Simulation, credit risk and use of credit derivatives, operational risk, counterparty risk, and other topics. It discusses risk regulations, including Basel II, recent developments in Basel III, and recent regulations on the banking industry in the U.S.
Attribute: BPD3.

BPHD 8042. Equity Analysis. (3 Credits)
This course will feature a series of guest lecturers who are highly regarded experts in their respective areas. The course will cover wealth management, private equity, equity analysis in general, and analysis within specific industry sectors such as retail, media, insurance, etc. We are looking for highly motivated students who will ask lots of questions and who will engage the guest lecturers in meaningful dialogue during the discussion periods.
Attribute: BPD3.

BPHD 8043. Advanced Global Portfolio Management. (3 Credits)
The course will review (1) basics of modeling of securities' returns and volatility in the context of portfolio management / "buy-side"; (2) theoretical basis and empirical evidence of risk-return tradeoff and investor preferences; (3) main approaches to portfolio construction and challenges with their practical application; (4) performance evaluation, and other relevant portfolio management topics.
Attribute: BPD3.

BPHD 8044. Machine Learning. (3 Credits)
This course covers the mathematical and algorithmic underpinnings of core methods in machine learning. Students learn to develop and implement classifiers and learners, using calculus and linear algebra, and they consider learning on fully labeled, partially labeled, and unlabeled data. Students also analyze and implement dimensionality reduction methods. Topics include gradient ascent/descent, support vector machines, neural networks, hidden Markov models, information criteria, factor/component analysis, and expectation-maximization.
Attribute: BPD3.

BPHD 8045. Financial Intermediation. (3 Credits)
This seminar course provides an exposure to recent research on key topics in banking, and more generally, in financial intermediation. The course begins with the fundamentals of managerial decision-making in modern financial institutions and its impact on the flow of funds in the community and financial markets. The course also focuses on the functions of depository financial institutions, their operational issues, regulatory environments, and risk management strategies. The seminar additionally emphasizes the theoretical underpinnings and empirical frontiers in the field.
Attribute: BPD2.

BPHD 8046. Industrial Organization and Market Structure. (3 Credits)
This seminar covers a variety of micro- and macro-economic issues. It provides advanced understanding of economic fundamentals associated with consumers, firms, industry, and markets. The course may additionally addresses the challenges of aggregate economies, with issues covered including employment, inflation, trade, boom, recession, and/or crisis.
Attribute: BPD2.

BPHD 8047. Seminar in Empirical Corporate Finance. (3 Credits)
The course aims to improve doctoral students' empirical skills in corporate finance research. We will first spend five sessions covering Python, natural language processing, and the use of unstructured textual data in corporate finance. The rest of the sessions focus on the most widely used databases and identification strategies in empirical corporate finance.
Attribute: BPD2.

BPHD 8048. Research Methods & Design. (3 Credits)
This course will aid students in developing their dissertation work and perfecting their presentation and interview skills. It will cover new software for aiding dissertation work, Latex and Beamer, and data presentation strategies. It is intended for Ph.D. students who have completed their comprehensive exams and the Research and Writing course.
Attribute: BPD2.

BPHD 8049. Deep Learning. (3 Credits)
This course is an introduction to deep learning, a branch of machine learning typified by deep neural networks. Deep learning is behind many recent advances in AI, ranging from text mining and image recognition to machine translation, planning, and even game playing and autonomous driving. In this course, we will cover a range of topics including basic neural networks, Convolutional network, RNN, LSTM, GAN, Autoencoder, and Restricted Boltzmman Machine (RBM). Various learning techniques such as Adam, Dropout, BatchNorm, Xavier initialization, CD-K sampling, etc., will also be explored throughout the course. This is a programming intensive course. Students are required to be proficient in Python programming and have knowledge of basic machine learning algorithms and techniques.
Attribute: BPD3.

BPHD 8050. Advanced Quantitative Modeling I. (3 Credits)
This course is an in-depth study of the current modeling techniques used in finance research. The course will expand students' understanding of most contemporary empirical research methods in financial economics and banking, including skills in programming and designing empirical tests. Methodology and theory may both be covered. The course will offer rigorous hands-on exercises and train students in developing significant academic papers.
Attribute: BPD3.

BPHD 8051. Advanced Quantitative Modeling II. (3 Credits)
This course continues its in-depth study of the current modeling techniques used in finance research. The course will expand students' understanding of most contemporary empirical research methods in financial economics and banking, including skills in programming and designing empirical tests. Methodology and theory may both be covered. The course will offer rigorous hands-on exercises and train students in developing significant academic papers.
Attribute: BPD3.

BPHD 8052. Advanced Quantitative Modeling III. (3 Credits)
This course continues its in-depth study of the current modeling techniques used in finance research. The course will expand students' understanding of most contemporary empirical research methods in financial economics and banking, including skills in programming and designing empirical tests. Methodology and theory may both be covered. The course will offer rigorous hands-on exercises and train students in developing significant academic papers.
Attribute: BPD3.

BPHD 8053. Advanced Quantitative Modeling IV. (3 Credits)
This course continues its in-depth study of the current modeling techniques used in finance research. The course will expand students' understanding of most contemporary empirical research methods in financial economics and banking, including skills in programming and designing empirical tests. Methodology and theory may both be covered. The course will offer rigorous hands-on exercises and train students in developing significant academic papers.
Attribute: BPD3.

BPHD 8054. Strategic Branding. (3 Credits)
This course demonstrates the strategic importance of branding by focusing on the various ways brands acquire and sustain value in the marketplace. Students analyze relevant and comprehensive theories and all the necessary tools, ideas, and concepts to uncover the brands' identities and help managerial branding decisions. Topics discussed include sociocultural perspectives on branding and brand management, emotional branding, financial considerations, and consequences of branding decisions.

BPHD 8055. Data Analysis II. (3 Credits)
This course continues Data Analysis I. The course provides further understanding of the key elements of contemporary data analysis.
Attribute: BPD2.

BPHD 8090. Dissertation 1. (3 Credits)
Supervised dissertation hours.

BPHD 8091. Dissertation 2. (3 Credits)
Supervised dissertation hours.

BPHD 8092. Dissertation 3. (3 Credits)
Supervised dissertation hours.

BPHD 8093. Dissertation 4. (3 Credits)
Supervised dissertation hours.

BPHD 8094. Dissertation 5. (3 Credits)
Supervised dissertation hours.

BPHD 8095. Dissertation 6. (3 Credits)
Supervised dissertation hours.

BPHD 8096. Dissertation 7. (3 Credits)
Supervised dissertation hours.

BPHD 8097. Dissertation 8. (3 Credits)
Supervised dissertation hours.

BPHD 8098. Dissertation 9. (3 Credits)
Supervised dissertation hours.

BPHD 8099. Dissertation 10. (3 Credits)
Supervised dissertation hours.

BPHD 8100. Dissertation 11. (3 Credits)
Supervised dissertation hours.

BPHD 8101. Dissertation 12. (3 Credits)
Supervised dissertation hours.

BPHD 8102. Dissertation 13. (3 Credits)
Supervised dissertation hours.

BPHD 8103. Dissertation 14. (3 Credits)
Supervised dissertation hours.

BPHD 8999. Independent Study. (3 Credits)
Independent study for Ph.D. students in business with a faculty adviser on an agreed-upon topic. In close collaboration with their advisers, students use the independent study to develop, research, and write an academic paper.

BPHD 9001. Topics in Business Research 1. (1.5 Credits)
In-depth study of a variety of theoretical and empirical topics in business disciplines.
Attribute: BPD1.

BPHD 9002. Topics in Business Research 2. (1.5 Credits)
In-depth study of a variety of theoretical and empirical topics in business disciplines.
Attribute: BPD1.

BPHD 9003. Topics in Business Research 3. (1.5 Credits)
In-depth study of a vairety of theoretical and empirical topics in business disciplines.
Attribute: BPD1.

BPHD 9004. Topics in Business Research 4. (1.5 Credits)
In-depth study of a variety of theoretical and empirical topics in business disciplines.
Attribute: BPD1.

BPHD 9005. Topics in Business Research 5. (1.5 Credits)
In-depth study of a variety of theoretical and empirical topics in business disciplines.
Attribute: BPD1.

BPHD 9006. Topics in Business Research 6. (1.5 Credits)
In-depth study of a vairety of theoretical and empirical topics in business disciplines.
Attribute: BPD1.

BPHD 9007. Empirical Issues in Business Research. (3 Credits)
Provides an understanding of empirical issues in business research.
Attribute: BPD2.

BPHD 9008. Quantitative Analysis I. (1.5 Credits)
In-depth study of quantitative analysis.
Attribute: BPD3.

BPHD 9009. Quantitative Analysis II. (1.5 Credits)
Continuing in-depth study of quantitative analysis.
Attribute: BPD3.

BPHD 9010. Empirical Issues in Research 2. (3 Credits)
Provides a continuing understanding of empirical issues in business research.
Attribute: BPD2.

BPHD 9011. Empirical Issues in Business Research 3. (3 Credits)
This course provides a continuing understanding of empirical issues in business research.
Attribute: BPD2.

BPHD 9012. Topics in Business Research 7. (1.5 Credits)
This course offers an in-depth study of a variety of theoretical and empirical topics in business disciplines.
Attribute: BPD1.

BPHD 9013. Topics in Business Research 8. (1.5 Credits)
This course involves in-depth study of a variety of theoretical and empirical topics in business disciplines.
Attribute: BPD1.

BPHD 9014. Blockchain. (1.5 Credits)
Students in this course will explore the role currency plays in the economy; the emerging technologies pioneering new forms of digital money; and the impact these technologies will have on currency, the economy, and the broader category of capital.
Attribute: BPD3.

BPHD 9015. Digital Currencies. (1.5 Credits)
This course will explore specific examples of new technologies being used to develop new forms of currency and digital money, and redefine the broader category of capital. The course will use real products and services to explore these topics.
Attribute: BPD3.

BPHD 9016. Empirical Issues in Business Research 4. (3 Credits)
This course provides a continuing understanding of empirical issues in business research.
Attribute: BPD2.

BPHD 9017. Empirical Issues in Business Research 5. (3 Credits)
Provides a continuing understanding of empirical issues in business research.
Attribute: BPD2.

BPHD 9030. Machine Learning and Text Mining 1. (1.5 Credits)
This course covers technical topics of web and text mining methodologies and research studies in the area of design science and social computing.
Attribute: BPD3.

BPHD 9031. Machine Learning and Text Mining 2. (1.5 Credits)
This course covers technical topics of web and text mining methodology and research studies in the area of design science and social computing.
Attribute: BPD3.

BPHD 9039. Learning from Established Scholars. (3 Credits)
This course puts students in direct conversation with established international scholars. Through a series of lectures, seminars, workshops, and other modules, students will receive instruction on a variety of topics from visiting scholars who are among the very best in their field. Research performed during this course may lead to further collaboration and independent work.
Attribute: BPD3.

BPHD 9040. Acting. (1.5 Credits)
This course covers acting techniques for doctoral business students. It includes empathetic listening, assertive influence, sense of of space, expressive power, and other key concepts. The course provides students with knowledge and skills that may later be used for presentations, classroom teaching, and other contexts in which ideas will be delivered.
Attribute: BPD3.

BPHD 9041. Learning from Established Scholars 2. (3 Credits)
This course continues to put students in direct conversation with established international scholars. Through a series of lectures, seminars, workshops, and other modules, students will receive instruction on a variety of topics from visiting scholars who are among the very best in their field. Research performed during this course may lead to further collaboration and independent work.
Attribute: BPD3.

BPHD 9042. Learning from Established Scholars 3. (3 Credits)
This course continues to put students in direct conversation with established international scholars. Through a series of lectures, seminars, workshops, and other modules, students will receive instruction on a variety of topics from visiting scholars who are among the very best in their field. Research performed during this course may lead to further collaboration and independent work.
Attribute: BPD3.

BPHD 9043. Learning from Established Scholars 4. (3 Credits)
This course continues to put students in direct conversation with established international scholars. Through a series of lectures, seminars, workshops, and other modules, students will receive instruction on a variety of topics from visiting scholars who are among the very best in their field. Research performed during this course may lead to further collaboration and independent work.
Attribute: BPD3.

BPHD 9050. Ethics. (1.5 Credits)
This is an intensive course focused on issues related to ethics. Students may consider issues of morality, value, and virtue, among other topics, and they will consider the notion of ethics both in a general philosophical sense and in the specific context of their own business studies and research.