

# Business Administration (BSAD/BUSA)

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## COURSES

### **BSAD 6182. INDEPENDENT STUDIES IN BUSINESS ADMINISTRATION. 1 Hour.**

This independent study course is centered on the application of content related to teaching in higher education settings. Students will be expected to design a lesson, present a lecture, and arrange for a final feedback report following an observed teaching demonstration. The focus will be on reflective teaching, sound lesson design, and receiving feedback towards improved teaching practice in higher education.

### **BSAD 6310. FOUNDATIONS OF SCIENTIFIC INQUIRY. 3 Hours.**

The evolution of the modern corporation is briefly addressed. The core topics include the structure of explanation, the structure of scientific laws, theory building, philosophy of science and relativistic/post-relativistic philosophies of science.

### **BSAD 6311. EXPERIMENTAL DESIGN AND RESEARCH METHODS. 3 Hours.**

In-depth coverage of selected topics in the design of research; topics include philosophy of science, theory of measurement, complex experimental and quasi-experimental designs.

### **BSAD 6312. REGRESSION. 3 Hours.**

The theoretical and practical aspects of regression analysis. Topics include simple and multiple linear regression, the matrix formulation of regression models, regression diagnostics and remedial measures, collinearity and ridge regression, normal correlation models, and non-linear least squares, time series including ARIMA models are covered. Practical applications of statistical software packages are emphasized.

### **BSAD 6313. ANOVA. 3 Hours.**

Experimental design and data analysis, especially as related to business and economic research. Topics include completely randomized designs, complete and incomplete blocks, nested designs, estimation and testing of fixed, random and mixed effects, sampling, nonparametric statistics and analysis of variance.

### **BSAD 6314. MULTIVARIATE STATISTICS. 3 Hours.**

Topics include commonly applied multivariate methods such as multiple analysis of variance, factor analytic methods, discriminant analysis, logistic regression, canonical correlations, profile analysis, cluster analysis, and repeated measures. The use available computer packages to conduct data analysis will be stressed.

### **BSAD 6315. TIME SERIES. 3 Hours.**

Univariate and multivariate time series; analysis of economic and financial data; out-of-sample forecasting using computer software. Autoregressive-moving average models, vector autoregression, unit roots, co-integration, ARCH and GARCH.

### **BSAD 6316. FINANCIAL ECONOMETRICS. 3 Hours.**

In-depth study of the econometric tools and techniques used in empirical finance research. Course emphasizes data extraction and analysis of common finance databases, as well as the theoretical basis for current empirical finance techniques and methods.

### **BSAD 6317. APPLIED BUSINESS & ECONOMICS DATA ANALYSIS I. 3 Hours.**

The course develops an understanding of basic statistical and econometric techniques. Participants exploit real data and computational power to uncover patterns/trends and examine relationships. There is a focus on conceptual frameworks and the application of techniques to data sets in various fields. Participants learn how to use statistical packages such as R, SAS, and STATA to apply the tools to real data. Participants will complete an empirical analysis paper. Prerequisite: BSTAT 5325 or consent of instructor.

### **BSAD 6318. APPLIED BUSINESS AND ECONOMICS DATA ANALYSIS II. 3 Hours.**

The course covers cross-section, panel data, and limited dependent variables methods. Topics may include analysis of natural experiments/differences-in-differences, panel data methods, instrumental variable estimation, simultaneous equation models, sample selection corrections, and limited dependent variable and hierarchical models. Participants learn how to use statistical packages such as R and SAS, to apply these methods to data to examine causal relationships. They build an understanding of appropriate methods for different research design. Participants will complete an empirical research paper. Prerequisite: ECON 5336 or BSAD 6317 or consent of the instructor; cross referenced with ECON 5339.

### **BSAD 6319. BUSINESS & ECONOMIC FORECASTING. 3 Hours.**

This applied course provides students the foundation to analyze business, economic, and financial data to develop forecasts using current statistical and computing tools. Emphasis is on methods that allow students to capture trending and seasonal patterns present in the data and other predictable variations hiding in plain sight, including temporal correlation. Once equipped with appropriate models, including ARIMA methods, students learn how to use the extracted information to project into the future. Critical thinking will be strengthened, as students will select an appropriate forecasting model and demonstrate its efficacy against reasonable alternatives. Prerequisite: ECON 5336 or BSAD 6317 or consent of the instructor.

### **BSAD 6320. CAUSAL INFERENCE FOR BUSINESS DECISIONS. 3 Hours.**

Students learn methods to identify and measure the outcomes of business decisions. In particular, students will learn various issues pertaining to the misattribution of causal effects. The course surveys multiple methods to overcome the misidentification problem. Students will engage in empirical analysis. Prerequisite: ECON 5336 or BSAD 6317 and ECON 5339 or BSAD 6318.

**BSAD 6321. FOUNDATIONS OF STRUCTURAL EQUATION MODELING. 3 Hours.**

The purpose of this course is to provide a foundation into structural equation modeling (SEM) techniques and issues as well as hands-on training with SEM software. Application of basic techniques such as confirmatory factor analysis (CFA), mediation and moderation in SEM, and multi-group analyses will be covered. Students must have taken a graduate course on regression. Prerequisite: Multivariate.

**BSAD 6322. MODELING IN BUSINESS RESEARCH. 3 Hours.**

A wide range of modeling techniques such as game theory in economics, discrete choice models in marketing and dynamical stochastic models will be discussed. The course focuses on model development to match mathematical framework and features to the underlying research setting and estimation/model selection techniques. Examples drawing from multiple research disciplines will be used to demonstrate relevant techniques and design principles step by step.

**BSAD 6323. DATA ANALYTICS SEMINAR. 3 Hours.**

The imperative to harness vast amounts of data has spawned a number of tools and techniques that complement traditional statistical approaches. From a research perspective, these tools and techniques afford new ways of collecting and analyzing data. This seminar will introduce students to contemporary data analytic techniques, including social network analysis, text analysis, machine learning and AI, and their applications in research.

**BSAD 6330. Nonparametric Statistics. 3 Hours.**

A survey of statistical tools which may be used when the normal assumptions of parametric statistics cannot be made; including procedures for categorical data, methods involving ranks, bootstrapping, and Kolmogorov-Smirnov type techniques. Cross listed with BSTAT 5330. Prerequisite: BSTAT 5325 or equivalent.

**BSAD 6392. DOCTORAL RESEARCH AND TEACHING COLLOQUIUM. 3 Hours.**

Review of the research process and contemporary developments in the methodology and design of empirical research in the major fields of study represented in the doctoral program. Review of teaching methods for effective classroom instruction. May be repeated for credit.

**BSAD 6399. DISSERTATION. 3 Hours.****BSAD 6699. DISSERTATION. 6 Hours.****BSAD 6999. DISSERTATION. 9 Hours.****BSAD 7399. DOCTORAL DEGREE COMPLETION. 3 Hours.**

This course may be taken during the semester in which a student expects to complete all requirements for the doctoral degree and graduate. Enrolling in this course meets minimum enrollment requirements for graduation, for holding fellowships awarded by The Office of Graduate Studies and for full-time GTA or GRA positions. Students should verify that enrollment in this course meets other applicable enrollment requirements. To remain eligible in their final semester of study for grants, loans or other forms of financial aid administered by the Financial Aid Office must enroll in a minimum of 5 hours as required by the Office of Financial Aid. Other funding sources may also require more than 3-hours of enrollment. Additional hours may also be required to meet to requirements set by immigration law or by the policies of the student's degree program. Students should contact the Financial Aid Office, other sources of funding, Office of International Education and/or their graduate advisor to verify enrollment requirements before registering for this course. This course may only be taken once and may not be repeated. Students who do not complete all graduation requirements while enrolled in this course must enroll in a minimum of 6 dissertation hours (6699 or 6999) in their graduation term. Graded P/F/R.

## COURSES

**BUSA 2211. BUSINESS DATA LITERACY AND VISUALIZATION. 2 Hours.**

This course is designed to introduce business data literacy and business data visualization. The course will cover data fundamentals including both the principles and techniques needed to effectively validate business data, draw insights from business data, and communicate the results. Students will learn the value of visualizations, specific techniques in visualization, and how to best leverage visualization methods to tell engaging business data stories.

**BUSA 4344. SAS TOOLS FOR BUSINESS AND ECONOMICS. 3 Hours.**

SAS is used by many businesses to generate analysis and reports they rely on to make good decisions. This course teaches students the skills needed to use SAS to clean data, visualize data, conduct basic business and economic analysis, and present that information in business-friendly reports using the tools in SAS for effective communication. Prerequisite: BSTAT 3321.

**BUSA 4345. R FOR BUSINESS AND ECONOMIC ANALYSIS. 3 Hours.**

This course teaches students how to analyze, visualize, and summarize data analysis using R. It covers the preliminaries of coding, data cleaning and visualization, and report writing using RStudio's markdown package. Students will then use the techniques learned in the course to write a modern, data analysis report using contemporary business or economic data. Prerequisite: BSTAT 3321.

**BUSA 5322. DATA ANALYTICS WITH PYTHON AND MACHINE LEARNING. 3 Hours.**

This course uses Python to give students hands-on experience with web scraping and machine learning. Web scraping gives students the ability to collect data from webpages that would be difficult to acquire otherwise. Machine learning techniques covered in this class include linear regression and classification, trees and tree-based methods such as random forests, neural networks, support vector machines, clustering, and dimension reduction methods. This class will help students learn to use Python in a professional context, and students will add supervised and unsupervised machine learning techniques to their economic analysis toolkit. Prerequisite: ECON 5336 or BSTAT 5325 or consent of instructor.

**BUSA 5344. SAS TOOLS FOR BUSINESS AND ECONOMICS. 3 Hours.**

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