

MASTER OF SCIENCE IN BUSINESS ANALYTICS

Program Director

Dr. Yogesh Uppal
Williamson Hall 3377
(330) 941-3494
yuppal@ysu.edu

Program Description

The Online MS in Business Analytics provides students the managerial and technical skills for data-driven decision making in an organization. Students will learn how to analyze data and apply quantitative models to understanding business, organizational, and societal issues. The program emphasizes the ability to formulate insightful questions using data, provide actionable solutions to business and economic problems, and to interpret analytical models to improve business and economic decision making. Graduates of this program will have technical, quantitative, and business skills for today's increasingly data-driven professions.

Admission Requirements

Applicants must meet the criteria of one of the following admission pathways:

1. Earned an undergraduate degree in business, economics, or S.T.E.M.^[1] with a 3.0+ GPA. No full-time professional work experience or standardized test score required.
2. Earned an undergraduate degree in any discipline with a 2.7+ GPA and demonstrated strong quantitative ability as evident in prior coursework, professional work experience or standardized test scores.
3. Earned a graduate or terminal degree (e.g., PhD, MD, or JD) in any field. No work experience or standardized test required.

^[1] S.T.E.M. is an acronym that refers to teaching and learning in the fields of science, technology, engineering, and mathematics. For a complete list of specific degree programs that meet the S.T.E.M criteria, refer to the DHS STEM Designated Degree Program List (<https://www.ice.gov/doclib/sevis/pdf/stemList2023.pdf>). If a specific degree program (the CIP Code Title) is not included in this list, the degree program does not meet the S.T.E.M admission criteria.

Degree Requirements

Students must complete 30 semester hours of graduate credit with a grade point average of 3.0 or higher for the M.S. in Business Analytics.

COURSE	TITLE	S.H.
Required Courses		
BUS 6930	Business Analytics	3
BUS 6932	AI for Business Analytics	3
BUS 6940	Data Analytics and Data Management	3
ECON 6912	Applied Microeconomics	3
ECON 6915	Healthcare Analytics	3
ECON 6939	Financial Markets and Institutions	3
ECON 6976	Predictive Analytics	3
ECON 6998	Business Analytics Project	3
OMBA 6955	Marketing Strategy	3
Select one course		3
Total Semester Hours		30

Learning Outcomes

Graduates of the Master of Science in Business Analytics should be able to do the following:

1. **Formulate Insightful Questions:** Ability to develop meaningful, data-driven questions addressing business and economic challenges.
2. **Demonstrate Technical and Business Skills:** Possess expertise in analytical tools combined with managerial and economic knowledge to enhance organizational decision making
3. **Analyze and Interpret Data:** Extract, analyze, and interpret data to uncover business and economic insights.
4. **Communicate Analytical Findings:** Effectively communicate data-driven insights and recommendations to stakeholders.

Tomi P. Ovaska, Ph.D., Professor
Public finance; comparative economic systems; entrepreneurship; international trade; behavioral economics

Joseph Palardy, Ph.D., Professor
Macroeconomics; time series econometrics

Albert J. Sumell, Ph.D., Professor
Urban, housing, and environmental economics

Yogesh Uppal, Ph.D., Professor
Applied microeconomics; applied econometrics; public economics; political economy; development economics

Yaqin Wang, Ph.D., Professor
Futures markets; behavioral economics

ECON 5806 History of Economic Thought 3 s.h.

Designed to provide students with an understanding of the development of economic ideas to include: Mercantilism, Physiocrats, the English Classical School, Utilitarianism, early Social Thought, Karl Marx, the German Historical School, Institutionalists and the Keynesian School.

Prereq.: ECON 2630.

ECON 5811 International Trade 3 s.h.

Theories of international trade and specialization; free trade vs. protectionism; tariff and non-tariff barriers to international trade; international balance of payments and its components; the role of multinational enterprises in contemporary trade pattern; regional economic integrations and world trade; U.S. commercial policies.

Prereq.: ECON 2610.

ECON 5812 International Finance 3 s.h.

Theories of foreign exchange and capital movements, international payments, analysis of spot and forward foreign exchange markets, foreign exchange market arbitrage, speculation, and risk hedging. The Bretton Woods agreement and the contemporary international monetary system. The rise of international organizations and multinational enterprises in the international economy.

Prereq.: ECON 2630.

ECON 5822 Crime and Urban Economics 3 s.h.

This course will draw upon economic models and theories and use the tools of economics to analyze problems of urban areas with an emphasis on the economics of crime, drugs, and incarceration. Topics include the causes of the growth or decline in cities, the theory of location, agglomeration, housing, segregation, suburbanization, and auto congestion.

Prereq.: ECON 2610.

ECON 5824 Applied Time Series Analysis of Economic and Business Data 3 s.h.

An in-depth analysis of time series models and their applications to problems in economics and business. Emphasis on forecasting. Extensive use of standard computer programs.

Prereq.: ECON 2610 and STAT 4817 or ECON 3790 or (ECON 3788 and ECON 3789) or (ECON 3788 and BUS 3700).

ECON 5850 Introduction to Game Theory 3 s.h.

Topics include (not limited to) Nash equilibrium, pure/mixed strategy, static/dynamic games, repeated games and coordination, perfect/incomplete information, etc.

Prereq.: ECON 2610.

ECON 5861 SAS Programming for Data Analysis 3 s.h.

An introduction to SAS programming for data analytics. Topics include using SAS for data processing, manipulation, visualization, reporting, and statistical analysis. The objective is for students to develop statistical computing skills for problem solving and decision making.

Prereq.: STAT 2601 or STAT 3717 or STAT 3743 or ECON 3790, or ECON 3788 and ECON 3789, or ECON 3788 and BUS 3700.

Cross-Listed: STAT 5811.

ECON 6912 Applied Microeconomics 3 s.h.

This course provides comprehensive coverage of microeconomic issues by analyzing applications of the theory. This includes study of demand and supply, theory of behavior of consumers and firms, choice under uncertainty, partial equilibrium analysis of various market structures, and Pareto efficiency. The course will focus on applications of the theory through current applied economic research peer reviewed articles.

ECON 6915 Healthcare Analytics 3 s.h.

In this course we will learn skills necessary to analyze and interpret healthcare data to improve evidence-based decision-making, patient outcomes, and overall healthcare system performance. Topics include data management, exploratory data analysis (EDA), predictive modelling and model evaluation as it relates to various health care data. We also learn about the main issues that plague the healthcare markets in the US.

ECON 6922 Macroeconomic Theory 3 s.h.

Examines models used to determine the value of various aggregate economic variables, such as the price level, national income, employment, interest rates, and wage rates.

ECON 6939 Financial Markets and Institutions 3 s.h.

Study of the institutions, instruments, and markets that facilitate the distribution of financial resources throughout the economy. The course discusses the money, capital, and commodity markets. Also, the topics of accessing default risk and hedging against market risk are discussed.

ECON 6945 Public Finance 3 s.h.

Study of the role of the government in the economy. The topics covered will include expenditure analysis, theories of taxation, provision of public goods, fiscal federalism, and public choice theory.

Prereq.: ECON 6912.

ECON 6970 Economics Internship 3 s.h.

The practical application of economic knowledge and statistical skills in the workplace. Students assist participating professionals in various kinds of industrial, financial, and public service organizations.

Prereq.: ECON 6912 and ECON 6922, Special Approval of Director.

ECON 6976 Predictive Analytics 3 s.h.

Study of the fundamentals of econometric techniques that are useful for estimating causal economic relationships. The objectives include (1) analysis of the effects of exogenous factors on the variable whose behavior we seek to explain, (2) testing of hypotheses about new and existing economic theories, and (3) forecasting estimated economic relationships beyond the sample period for the purpose of planning and control. The course will focus on the practice of econometrics with extensive applications to a variety of real-world problems in many areas of economics.

ECON 6980 Applied Time Series Analysis and Forecasting 3 s.h.

Covers essential tools for time series analysis and forecasting with emphasis on how to apply those tools to analyze and forecast economic and business data. Topics include ARMA models, Time Series Decomposition, Exponential Smoothing, GARCH, VAR models, and Cointegration.

Prereq.: ECON 2610 and ECON 3789 or ECON 3790 or ECON 6976 or STAT 5817.

ECON 6990 Special Topics in Economics 1-3 s.h.

Special interest topics selected by the staff in the following areas: economic education, economic theory, and applied economics analysis. May be repeated for a maximum of six hours toward a graduate degree.

ECON 6992 Data Analytics - Advanced SAS Programming 3 s.h.

This course is designed to provide students training of advanced SAS programming for data analysis. Main topics include SQL, Macro language, Econometrics-related procedures, working with large data set, etc.

Prereq.: ECON 6976 or equivalent and either ECON 5861 or STAT 5811.

Cross-Listed: STAT 6912.

ECON 6998 Business Analytics Project 3 s.h.

Students are required to undertake an original quantitative research project in a field of economics and write a paper summarizing their results.

Prereq.: BUS 6930.

Prereq. or Coreq.: ECON 6976.

ECON 6999 Master's Thesis 3 s.h.

A research project under the supervision of a member of the department on the graduate faculty. The project typically extends the student's research in ECON 6998.

Prereq.: a grade of "A" or "B" in ECON 6998 and a thesis proposal accepted by departmental committee.