

B.S. In Data Science with Economic Analytics (ECAN) Concentration

A data science degree with a concentration in economic analytics will provide students with a strong background in economic theory and the latest applied tools in big-data econometrics, forecasting, optimization, and machine learning methods in economics. These “big-data” skills, combined with knowledge of economic modeling, will enable them to identify, assess, and seize the opportunity for data-driven value creation in the private and public sector.

Concentration = 21 Hours

Course Code	Course Title	Hours
<i>Required Courses for Economic Analytics Concentration</i>		
ECON 3033	Microeconomic Theory	3
ECON 3133	Macroeconomic theory	3
ECON 4743	Introduction to Econometrics	3
ECON 4753	Forecasting	3
ECON 4763	Economic Analytics	3
Total Requirements		15
<i>Electives For Economic Analytics Concentration (Select 6 Hours)</i>		
ECON 4333	Economics of Organizations	3
ECON 4423	Behavioral Economics	3
ECON 4433	Experimental Economics.	3
ECON 4643	International Macroeconomics and Finance	3
ECON 4633	International Trade	3
ECON 3853	Emerging Markets	3
ECON 3843	Economics of the Developing World	3
ECON 3533	Labor Economics	3
ECON 3433	Money and Banking	3
ECON 3333	Public Economics	3
ECON 3143	Economics of Poverty and Inequality	3

Total Hours: 21

*A selection of upper division economics electives is proposed for the following reasons: (i) these courses utilize data analysis and quantitative methods; (ii) students will have a diversity of courses to choose from depending upon their interest; (iii) this will provide options to students as not all electives are offered every semester.

University of Arkansas B.S. Data Science Program Outcomes

The UAF B.S. Data Science major will prepare students for a successful career in data science with an amalgamation of capabilities:

1. Design, implement, and evaluate a data driven solution to meet a given set of stakeholder requirements in the context of the program’s discipline involving the collection, representation, manipulation, storage, governance, security, modeling (descriptive, predictive, and prescriptive), and visualization of data.

2. Analyze a complex problem facing industry, government, or society and to apply principles of data science and other relevant disciplines to identify solutions.
3. Recognize professional responsibilities and make informed judgments in data science practice based on legal and ethical principles.
4. Apply critical thinking, problem identification, problem solving skills, theory, techniques, and tools throughout the data analysis lifecycle and employ the resulting knowledge to satisfy stakeholders' needs.
5. Function effectively as a member or leader of a multidisciplinary team engaged in activities appropriate to the program's discipline.
6. Communicate effectively (in written, verbal, technical, visual, and non-technical forms) in a variety of professional contexts and assist decision makers with the interpretation and implications of conclusions supported by data.

Economic Analytics Concentration Learning Objectives:

7. Apply microeconomic and macroeconomic analysis to business and economic problems.
8. Use modern statistical methods, including econometrics, forecasting and machine learning, in data-driven economic and business problems.
9. Use economic models and data to make strategic decisions in business, economics, and public policy.

Course Code	Course Title	Core Outcomes	Concentration Outcomes
<i>Required Economic Analytics Concentration Courses (15)</i>			
ECON 3033	Microeconomic Theory	2, 4, 6	7, 9
ECON 3133	Macroeconomic theory	2,4,6	7, 9
ECON 4743	Introduction to Econometrics	1, 2, 3, 4, 5, 6	7,8,9
ECON 4753	Forecasting	1, 2, 3, 4, 5, 6	7, 8, 9
ECON 4763	Economic Analytics	1, 2 3, 4, 5, 6	7, 8, 9
<i>Elective Economic Analytics Concentration Courses (6)</i>			
ECON 4333	Economics of Organizations	2, 3, 4, 5, 6	7, 9
ECON 4423	Behavioral Economics	2, 3, 4, 6	7, 9
ECON 4433	Experimental Economics	1,2, 3, 4, 6	7, 8, 9
ECON 4643	International Macroeconomics and Finance	2, 3, 4, 5, 6	7, 9
ECON 4633	International Trade	2, 4, 6	7, 9
ECON 3853	Emerging Markets	2, 3, 4, 5, 6	7, 9
ECON 3843	Economics of the Developing World	2, 3, 4, 5, 6	7, 9
ECON 3533	Labor Economics	2, 3, 4	7, 9
ECON 3433	Money and Banking	2, 3, 4	7, 8, 9
ECON 3333	Public Economics	2, 3, 4	7, 9
ECON 3143	Economics of Poverty and Inequality	2, 3, 4, 5, 6	7, 9

Enhancing Overall Program Outcomes:

1. Design, implement, and evaluate a data driven solution to meet a given set of stakeholder requirements in the context of the program's discipline involving the collection, representation, manipulation, storage, governance, security, modeling (descriptive, predictive, and prescriptive), and visualization of data.

The Economic Analytics concentration will provide students with the ability to analyze, digest, visualize, and ultimately harness data to drive decision making in the private and public sector.

2. Analyze a complex problem facing industry, government, or society and to apply principles of data science and other relevant disciplines to identify solutions.

The Economic Analytics concentration will provide students with a strong background in economic theory and the latest applied tools in big-data econometrics and machine learning methods, optimization, and computing. These "big-data" skills, combined with knowledge of economic modeling, will enable them to identify, assess, and seize the opportunity for data-driven value creation in the private and public sector.

3. Recognize professional responsibilities and make informed judgments in data science practice based on legal and ethical principles.

Students will evaluate the ways in which economic analysis can involve tradeoffs and that social and economic problems can often have different solutions. They will learn that recommendations and feasibility of proposals and decisions depend on legal, cultural and ethical boundaries.

4. Apply critical thinking, problem identification, problem solving skills, theory, techniques, and tools throughout the data analysis lifecycle and employ the resulting knowledge to satisfy stakeholders' needs.

Students will demonstrate an ability to integrate complex data-based concepts with economic analysis to provide recommendations of relevance to stakeholders in the public and private sector.

5. Function effectively as a member or leader of a multidisciplinary team engaged in activities appropriate to the program's discipline.

Students will learn how to collaborate on team projects to solve complex data-driven problems and deliver economically meaningful recommendations.

10. Communicate effectively (in written, verbal, technical, visual, and non-technical forms) in a variety of professional contexts and assist decision makers with the interpretation and implications of conclusions supported by data.

Students will develop the ability to handle an economic analytics problem from the point of problem definition to delivery of a solution; be proficient in collecting and processing real-world data using advanced big data techniques and software; be competent in working in small groups and delivering their ideas and results.