

New Program Proposal

Data Science and Analysis, BS

General Education Requirements

Students must satisfy the university general education requirements. Many of the courses for the degree may be used to fulfill math proficiency, information literacy, social science, and math and life/natural sciences requirements. There is no foreign language requirement for the degree.

Satisfactory/Unsatisfactory Option

Courses required for the major may not be taken on a satisfactory/unsatisfactory basis.

Degree Requirements

The BS in Data Science and Analysis consists of a set of core courses along with an emphasis area.

Core Course		
MATH 1800	Analytic Geometry and Calculus I ¹	3-5
or MATH 1100	Basic Calculus	
Choose one of the following statistics courses that aligns with emphasis area:		3
SOC/ANTHRO 3220	Quantitative Data Analysis in Social Science Research	
BIOL 4122	Biometry	
ECON 3100	Economic Data and Statistics	

CRIMIN 2220	Statistical Analysis in Criminology and Criminal	
MATH 1320	Introduction to Probability and Statistics	
PSYCH 2201	Psychological Statistics	
POL SCI 3000	Political Analysis	
SCMA 3300	Business Analytics and	
MATH 4005	Exploratory Data Analysis with	3
CMP SCI 1250	Introduction to Computing	3
CMP SCI 4200	Python for Scientific Computing and Data Science	3
CMP SCI 4342	Introduction to Data Mining	3
Total Hours		21-23

¹ Students interested in the Computer Science emphasis area, the Mathematics emphasis areas, or in taking additional mathematics courses should take MATH 1800.

Biology Emphasis Area

BIOL 1821	Introductory Biology: Organisms and the Environment (MOTR BIOL 150L)	5
BIOL 1831	Introductory Biology: From Molecules to Organisms (MOTR BIOL 150L)	5
BIOL 2012	Genetics	3
BIOL 4436	Bioinformatics	3

Choose three of the following:	9
BIOL 2102	Ecology
BIOL 3302	Evolution
BIOL 3622	Cell Biology
BIOL 4182	Population Biology
BIOL 4602	Molecular Biology
BIOL 4732	Principles of Biochemistry
ECON 4160	Geospatial Analysis in the Social Sciences
Total Hours	25

Computer Science Emphasis Area

CMP SCI 2250	Programming and Data Structures	3
CMP SCI 2261	Object-Oriented Programming	3
CMP SCI 3130	Design and Analysis of Algorithms	3
MATH 1900	Analytic Geometry and Calculus II	5
MATH 2000	Analytic Geometry and Calculus III	5
MATH 4200	Mathematical Statistics I	3
Choose three of the following:	9	
CMP SCI 4030	Introduction to Intelligent Web	
CMP SCI 4300	Introduction to Artificial Intelligence	

CMP SCI 4320	Introduction to Evolutionary Computation	
CMP SCI 4340	Introduction to Machine Learning	
CMP SCI 4370	Introduction to Biological Data Science	
CMP SCI 4390	Introduction to Deep Learning	
Total Hours		31

Economics Emphasis Area

ECON 1001	Principles of Microeconomics (MOTR ECON 102)	3
ECON 1002	Principles of Macroeconomics (MOTR ECON 101)	3
ECON 4100	Introduction to Econometrics	4
ECON 4110	Applied Econometrics	4
ECON 4120	Time Series Econometrics for Economics and Finance	4
or ECON 4130	Business and Economic Forecasting	
Choose one of the following:		3-4
ECON 4040	Booms and Busts in the Economy: Data and Theory	
ECON 4120	Time Series Econometrics for Economics and Finance (if not used above)	

ECON 4130	Business and Economic Forecasting (if not used above)	
ECON 4160	Geospatial Analysis in the Social Sciences	
Total Hours		21-22

Mathematics Emphasis Area

MATH 1900	Analytic Geometry and Calculus II	5
MATH 2000	Analytic Geometry and Calculus III	5
MATH 2450	Elementary Linear Algebra	3
MATH 4200	Mathematical Statistics I	3
MATH 4210	Mathematical Statistics II	3
Choose two of the following:		6
MATH 4090	Introduction to High-dimensional Data Analysis	
MATH 4220	Bayesian Statistical Methods	
MATH 4225	Introduction to Statistical Computing	
MATH 4250	Introduction to Statistical Methods in Learning and Modeling	
MATH 4260	Introduction to Stochastic Processes	
Total Hours		25

Social Science Emphasis Area

Choose two of the following. Courses must be from two subject areas:

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ANTHRO 1005	Introduction to Biological Anthropology
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ANTHRO 1011	Introduction to Cultural Anthropology (MOTR ANTH 201)
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ANTHRO 1019	Introduction to Archaeology
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CRIMIN 1100	Introduction to Criminology and Criminal Justice
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POL SCI 1100	Introduction to American Politics (MOTR POSC 101)
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POL SCI 1500	Introduction to Comparative Politics (MOTR POSC 202)
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POL SCI 1800	World Politics (MOTR POSC 201)
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PSYCH 1003	General Psychology (MOTR PSYC 100)
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SOC 1010	Introduction to Sociology (MOTR SOCI
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SOC 2280	Technology and Society
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Choose one of the following:

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CRIMIN 2210	Research Methods in Criminology and Criminal Justice
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PSYCH 2219	Research Methods in Psychological Science
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SOC 3230	Research Methods
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Choose three of the following. Courses must be from at least two subject areas:		9
ANTHRO/SOC 4015	Data Analytics in the Social Sciences	
ANTHRO/SOC 4160	Geographical Information Systems in Anthropology and Sociology	
ANTHRO 4310	Laboratory Methods in Archaeology	
POL SCI 3330	Public Opinion and Political Participation	
POL SCI 4040	Survey Research Practicum in Political Science	
PSYCH 4365	Psychological Testing and Assessment	
SOC 3344	Problems of Urban Community	
SOC 4040	Survey Research Practicum for Sociology	
Total Hours		18

Supply Chain Analytics Emphasis Area

SCMA 3301	Introduction to Supply Chain Management	3
SCMA 3320	Advanced Supply Chain and Operations Management	3
SCMA 4330	Business Logistics	3
SCMA 4331	Applied Supply Chain Modeling	3

SCMA 4350	Prescriptive Analytics and Optimization	3
Choose one of the following:		3
SCMA 3345	Predictive Analytics and Data Mining	
SCMA 3390	Internship in Supply Chain and Analytics	
SCMA 3398	Seminar in Supply Chain Management and Analytics ¹	
SCMA 4389	Supply Chain Management Practicum	
SCMA 4398	Advanced Topics in Supply Chain and Analytics ¹	
Total Hours		18

¹ Students must complete 3 credit hours in order to count the course as an elective.

Sign-offs from other departments affected by this proposal

Department	Contact Person	Phone #	Objections
S003100	Cezary Janikow		No
S007250	Jim Craig		No
S002850	Wendy Olivas		No
S005900	Haitao Li		No
S007050	Michael Griffin		No
Rationale	An emphasis area of interest for the new Data Science and Analysis degree.		