DATA ANALYTICS GRADUATE CERTIFICATE COURSE LISTS

For the most current lists of approved courses in these categories, please consult the Data Scholarship Program.

Data Analytics Computing Skills

Note that DSA 5001 and DSA 5011 are both one-hour courses. They cannot be used by themselves to satisfy the 3 credit-hour requirement.

Code	Title	Credit Hours
ASTR 5970	Special Topics/Seminar (topic: Machine Learning)	3
BIOL 5923	Programming in R for Biology	3
CHEM 5280	Practicum in Biochemistry	1-2
DSA 5001	Data Analytics and Media	1
DSA 5011	Introduction to R	1
DSA/ISE 5103	Intelligent Data Analytics	3
DSA/ISE 5113	Advanced Analytics and Metaheuristics	3
ECON 5253	Data Science for Economists	3
GIS 5003	Spatial Data Management for GIS Professionals	3
GIS 5453	Advanced GIS and Spatial Analysis	3
GRAD 5203	EOS3 Data Analytics	3
HSTM 5613	Issues and Methods in the Digital Humanities	3
LIS 5623	Advanced Data Analytics	3
LIS 5633	Web Design and Implementation	3
LIS 5643	Introduction to Data Analytics	3
LIS 5970	Special Topics/Seminar (topic: Introduction to Mobile App Development)	1-3
LTRS/HIST/WGS/HSTM/LIS 5970	Special Topics/Seminar (topic: Cultural Heritage Data and Social Engagement)	3
MBIO/PBIO 5783	Introduction to Python Programming for Data Analytics	3
METR 5330	Information Technology Skills for Meteorology	3
P SC 5923	Introduction to Analysis of Political Data	3

Graduate Statistics and Applied Math

Note that DSA 5005/C S 5005 is a 5-credit-hour course and can be used to meet the 3-credit-hour requirement. However, the extra two credit hours from DSA 5005/C S 5005
cannot be carried over to meet another requirement.

Code	Title	Credit Hours
Social Sciences		
ANTH 4713	Statistical Concepts in Anthropology	3
ANTH 5083	Quantitative Methods in Anthropology	3
COMM 5003	Quantitative Research Methods	3
COMM 5023	Introduction to Quantitative Research Methods	3
COMM 5033	Advanced Statistics	3
COMM 6970	Seminar in Communication (topic: Structural Equation Modeling)	3
ECON 4223	Econometric Analysis	3
ECON 4773	Economic Game Theory	3
ECON 5023	Statistics for Decision Making	3
ECON 5033	Managerial Economics I	3
ECON 5043	Managerial Economics II	3
ECON 5213	Advanced Econometrics	3
ECON 5243	Econometrics II	3
ECON 5253	Data Science for Economists	3
ECON 5970	Special Topics/Seminar (topic: Bayesian Econometrics)	3
ECON 6343	Econometrics III	3
P SC 5913	Introduction to Analysis of Political and Administrative Data	3
P SC 5923	Introduction to Analysis of Political Data	3
P SC 5933	Intermediate Analysis of Political Data	3
P SC 5940	Advanced Research Methods: Special Topics (topic: Maximum Likelihood Estimation)	3
PSY 5003	Psychological Statistics I	3
PSY 5013	Psychological Statistics II	3
PSY 6013	Factor Analysis and Structural Equation Models	3
PSY 6023	Statistical Models of Tests Scores	3
PSY 6063	Seminar in Quantitative Psychology (topics: Multivariate Analysis, Multilevel Modeling, Advanced SEM)	3
PSY 6073	Experimental Design for Psychology	3
SOC/P SC 5143	Program Evaluation	3
SOC 5313	Qualitative Research Methods	3
SOC 5283	Fundamentals of Sociological Statistics	3
SOC 5293	Advanced Methods of Social Research	3
SOC 5483	Advanced Regression Analysis	3
SOC 5823	Social Demography	3
SOC 5683	Categorical, Panel, and Advanced Statistical Analyses	3
Natural Sciences & Interdisciplinary		
ASTR 5970	Special Topics/Seminar (topic: Machine Learning)	3
BIOL 4913	Quantitative Biology (taken for graduate credit)	3
BIOL 5943	Multivariate Analysis	3
BIOL 5970	Special Topics in Biology (topic: Bayesian Models)	3
GEOG 5113	Quantitative Methods in Geographic and Environmental Research	3
GIS 5923	Spatial Statistics	3
HES 5283	Sports Financial and Market Analytics	3
HES 5313	Athlete Tracking and Monitoring in Sports	3
HES 5903	Sports Performance Analytics	3
HES 5953	Research Methods in Health and Exercise Science	3

HES 5963	Statistical Applications in Health and Exercise Science	3
METR 5313	Statistical Meteorology	3
METR 5433	Advanced Statistical Meteorology	3
Math, Engineering, & Computer Science		
C S 4413	Algorithm Analysis (taken for graduate credit)	3
C S 5033	Machine Learning Fundamentals	3
C S 5293	Text Analytics	3
DSA/C S 5005	Computing Structures	5
DSA/ISE 5013	Fundamentals of Engineering Statistical Analysis	3
DSA 5203	Time Series Analysis	3
DSA 5303	Financial Engineering Analytics	3
DSA 5403	Bayesian Statistics	3
MATH 4073	Numerical Analysis I (taken for graduate credit)	3
MATH 4733	Mathematical Theory of Probability (taken for graduate credit)	3
MATH 4753	Applied Statistical Methods (taken for graduate credit)	3
MATH 5093	Applied Numerical Methods	3
MATH 5743	Introduction to Mathematical Statistics	3
MATH 5793	Advanced Applied Statistics	3
MATH 5763	Introduction to Stochastic Processes	3
MATH 5773	Applied Regression Analysis	3
MATH 5803	Topics in Mathematics	3

Data Management and Visualization

Code	Title	Credit Hours
C S 5093	Visual Analytics	3
DSA/C S 4513	Database Management Systems (taken for graduate credit)	3
LIS 5673	Introduction to Information Visualization	3
LIS 5683	Database Design for Information Organizations	3
LIS 5970	Special Topics/Seminar (topic: Data Stewardship)	3
LIS 5970	Special Topics/Seminar (topic: Digital Life-Cycle Management)	1-3
LIS 5693	Information Retrieval and Text Mining	3
P SC 5940	Advanced Research Methods: Special Topics (topic: Visualizing Data)	3

Statistics, Data, or Computing Electives

Recommended Course topics: Computing, Experimental Design, Bayesian Analysis, Measurement, Structural Equation Modeling (SEM), Multilevel Modeling, Categorical Analysis, Network Analysis.

Code	Title	Credit Hours
An additional, non-redundant course from the categories listed above		
COMM 6573	Social Network Analysis	3
C S 5593	Data Mining	3

LIS 5453	Digital Collections	3
LIS 5693	Information Retrieval and Text Mining	3
LIS 5613	Dynamic Web Development	3
NAS 5153	Indigenous Mapping: Issues in Data Sovereignty and Security	3
P SC 5953	Qualitative Research Methods	3

Project-based Advanced Applied Data Analytics Experience

Interdisciplinary experience is encouraged.

Must produce a report with figures that includes a discussion of decision-making, ethics, biases, and limitations that are part of project.

Code	Title	Credit Hours
DSP 5633	Data Analytics and Applied Statistics Internship	3
CAS 5990	Independent Study (With faculty outside of your research group's expertise. May collaborate to apply a new method to your data.)	3
HSTM 5623	Practicum/Internship in the Digital Humanities	3
LIS 5940	Directed Project	3