DATA SCIENCE, CERTIFICATE

REQUIREMENTS

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The certificate requires a minimum of 16 credits.

Code	Title	Credits
Foundation Courses		**10-12**
Complete two programming courses from		*7-8*
COMP SCI 220	Data Science Programming I [1]	
or COMP SCI 320	Data Science Programming II	
STAT 240	Data Science Modeling I	
E C E 204	Data Science & Engineering	
Complete one ethics course from		*3-4*
L I S 461	Data and Algorithms: Ethics and Policy (4-credit Communication B optional)	
or E C E/ I SY E 570	Ethics of Data for Engineers	
Elective Courses		**6**
Complete a minimum of 6 credits of electives, including at least 3 credits from the Fundamental Electives list.		
Fundamental Electives		*3-6*
ACT SCI 654	Regression and Time Series for Actuaries	
ACT SCI 655	Health Analytics	
ACT SCI 657	Risk Analytics	
BIOCORE 382	Evolution, Ecology, and Genetics Laboratory	
BIOCORE 384	Cellular Biology Laboratory	
BIOCORE 486	Principles of Physiology Laboratory	
BSE 405	Artificial Intelligence in Agriculture	
CHEM 361	Machine Learning in Chemistry	
CIV ENGR 516	Hydrologic Data Analysis	
COMP SCI 320	Data Science Programming II [1]	
COMP SCI/E C E/ M E 532	Matrix Methods in Machine Learning	
COMP SCI 544	Introduction to Big Data Systems	
COMP SCI 565	Introduction to Data Visualization	
COMP SCI/ B M I 576	Introduction to Bioinformatics	
ECON 315	Data Visualization for Economists	
ECON 400	Introduction to Applied Econometrics	
ECON 410	Introductory Econometrics	
ECON 460	Economic Forecasting	
ECON 570	Fundamentals of Data Analytics for Economists	
ECON 695	Topics in Economic Data Analysis	
ED PSYCH 551	Quantitative Ethnography	
FINANCE 310	Data Analytics for Finance	
F&W ECOL 395	Data and GIS Tools for Ecology	
F&W ECOL 458	Environmental Data Science	
GEOG 378	Introduction to Geocomputing	
GEOG 560	Advanced Quantitative Methods	
GEOG 573	Advanced Geocomputing and Geospatial Big Data Analytics	
GEOG 574	Geospatial Database Design and Development	
GEOG 579	GIS and Spatial Analysis	
I SY E 412	Fundamentals of Industrial Data Analytics	
I SY E 521	Machine Learning in Action for Industrial Engineers	
INFO SYS 423	Digital Platform Analytics	
MATH 444	Graphs and Networks in Data Science	
MATH 535	Mathematical Methods in Data Science	
MATH 616	Data-Driven Dynamical Systems, Stochastic Modeling and Prediction	
PHYSICS 361	Machine Learning in Physics	
SOC 362	Statistics for Sociologists III	
SOIL SCI 585	Using R for Soil and Environmental Sciences	
STAT 340	Data Science Modeling II	
STAT 405	Data Science Computing Project	
STAT 436	Statistical Data Visualization	
STAT/ COMP SCI 471	Introduction to Computational Statistics	
Domain Electives		*0-3*
A A E/ECON 421	Economic Decision Analysis	
COMP SCI/E C E/ I SY E 524	Introduction to Optimization	
COMP SCI 541	Theory & Algorithms for Data Science	
GEN BUS 307	Business Analytics II	
INFO SYS 322	Introduction to Databases	
L I S 407	Data Storytelling with Visualization	
L I S 440	Navigating the Data Revolution: Concepts of Data & Information Science	
LSC 460	Social Media Analytics	
LSC 660	Data Analysis in Communications Research	
SOC 351	Introduction to Survey Methods for Social Research	
SOC/ C&E SOC 365	Data Management for Social Science Research	
SOC/ C&E SOC 618	Social Network Analysis	

RESIDENCE AND QUALITY OF WORK

- Minimum 2.000 GPA on all certificate courses
- At least 9 credits must be taken in residence at UW-Madison

FOOTNOTES

[1] COMP SCI 320 may count toward either the Foundation Courses or Fundamental Electives requirement, but not both.

CERTIFICATE COMPLETION REQUIREMENT

This undergraduate certificate must be completed concurrently with the student's undergraduate degree. Students cannot delay degree completion to complete the certificate.