MINOR IN DATA SCIENCE

Program Learning Outcomes for the Minor in Data Science

Upon completing the minor in Data Science, students will be able to:

1. Formulate questions in a domain that can be answered with data.
2. Use tools and algorithms from statistics, applied mathematics, and computer science for analyses.
3. Visualize, interpret, and explain results cogently, accurately, and persuasively.
4. Understand the underlying social, political, and ethical contexts that are importantly and inevitably tied to data-driven decision-making.

Requirements for the Minor in Data Science

Students pursuing the minor in Data Science must complete:

- A minimum of 7 courses (22-26 credit hours, depending on course selection) to satisfy minor requirements.
- A minimum of 5 courses (15-19 credit hours, depending on course selection) taken at the 300-level or above.
- 1 course (3-4 credit hours, depending on course selection) to satisfy the Prerequisite.
- 4 courses (12-14 credit hours, depending on course selection) to satisfy the Core Requirements.
- 1 course (3-4 credit hours, depending on course selection) to satisfy the Elective Requirement.
- A capstone project (4 credit hours).

The courses listed below satisfy the requirements for this minor. In certain instances, courses not on this official list may be substituted upon approval of the minor's academic advisor or, where applicable, the Program Director. (Course substitutions must be formally applied and entered into Degree Works by the minor's Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/)). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Minor in Data Science		22-26

Minor Requirements

Code	Title	Credit Hours
Prerequisite [1]		
DSCI 101	INTRODUCTION TO DATA SCIENCE	3-4
or COMP 140	COMPUTATIONAL THINKING	
Core Requirements [1,2]		
Statistics		
Select 1 course from the following:		*3-4*
BIOE 439	APPLIED STATISTICS FOR BIOENGINEERING AND BIOTECHNOLOGY	
BUSI 395	DATA ANALYTICS	
DSCI 301 / STAT 315	PROBABILITY AND STATISTICS FOR DATA SCIENCE	
ELEC 303	RANDOM SIGNALS IN ELECTRICAL ENGINEERING SYSTEMS	
PSYC 339	STATISTICAL METHODS-PSYCHOLOGY	
SOCI 382	SOCIAL STATISTICS	
SOSC 302	QUANTITATIVE ANALYSIS FOR THE SOCIAL SCIENCES	
STAT 280	ELEMENTARY APPLIED STATISTICS [3]	
STAT 305	INTRODUCTION TO STATISTICS FOR BIOSCIENCES	
STAT 310 / ECON 307	PROBABILITY AND STATISTICS	
STAT 311	HONORS PROBABILITY AND MATHEMATICAL STATISTICS	
Big Data		
Select 1 course from the following:		*3*
DSCI 302	INTRODUCTION TO DATA SCIENCE TOOLS AND MODELS [2]	
COMP 330	TOOLS AND MODELS FOR DATA SCIENCE	
COMP 430	INTRODUCTION TO DATABASE SYSTEMS	
Machine Learning		
Select 1 course from the following:		*3-4*
COMP 341	PRACTICAL MACHINE LEARNING FOR REAL WORLD APPLICATIONS	
COMP 540	STATISTICAL MACHINE LEARNING	
DSCI 303	MACHINE LEARNING FOR DATA SCIENCE	
ELEC 378	MACHINE LEARNING: CONCEPTS AND TECHNIQUES	
ELEC 478	INTRODUCTION TO MACHINE LEARNING	
STAT 413	INTRODUCTION TO STATISTICAL MACHINE LEARNING	
Ethics		
Select 1 course from the following:		*3*
DSCI 305	DATA, ETHICS, AND SOCIETY	
COMP 301	COMPUTER ETHICS	
Elective Requirement		
Select 1 course at the 300-level (or above) from department approved electives (see course list below) [4]		*3-4*
Capstone Requirement		
DSCI 435 / COMP 449	APPLIED MACHINE LEARNING AND DATA SCIENCE PROJECTS	4
Total Credit Hours		**22-26**

Footnotes and Additional Information

1. Note that selecting certain courses for Core Requirements may require additional prerequisites.
2. In certain situations the DSCI Official Certifier may approve various and specific course substitutions.

[3] The Data Science department has determined that credit awarded for STAT 180 *AP/OTH CREDIT IN STATISTICS* is not eligible for meeting the requirements of the Data Science minor.

[4] In certain instances, the DSCI Official Certifier may approve various or specific course substitutions. Courses at the 300-level (or above), other than those listed as *Department Approved Electives*, might also be allowed to fulfill the Elective Requirement, with approval from the Minor Advisor.

Course List to Satisfy Requirements

Code	Title	Credit Hours
Department Approved Electives [1]		
Select 1 course from the following:		*3-4*
ASTR 408	STATISTICAL METHODS IN PHYSICS AND ASTRONOMY	
BIOS 338	ANALYSIS AND VISUALIZATION OF BIOLOGICAL DATA	
CEVE 427 / MECH 427	PHYSICS GUIDED MACHINE LEARNING & DATA DRIVEN MODELING FEM	
CMOR 303	MATRIX ANALYSIS FOR DATA SCIENCE	
CMOR 442	LARGE-SCALE OPTIMIZATION	
COMP 340	STATISTICAL MODELS AND ALGORITHMS FOR DATA SCIENCE	
COMP 447 / ELEC 447	INTRODUCTION TO COMPUTER VISION	
COMP 480	PROBABILISTIC ALGORITHMS AND DATA STRUCTURE	
DSCI 304	INTRODUCTION TO EFFECTIVE DATA VISUALIZATION	
ECON 310 / STAT 376	ECONOMETRICS	
ECON 418	ECONOMIC FORECASTING	
EEPS 450	GEOPHYSICAL DATA ANALYSIS: DIGITAL SIGNAL PROCESSING	
EEPS 451	GEOPHYSICAL DATA ANALYSIS: INVERSE METHODS	
ELEC 431	DIGITAL SIGNAL PROCESSING	
ELEC 439	DATA SCIENCE AND DYNAMICAL SYSTEMS	
ELEC 440 / COMP 440	ARTIFICIAL INTELLIGENCE	
ELEC 483	MACHINE LEARNING AND SIGNAL PROCESSING FOR NEURO ENGINEERING	
ELEC 498 / COMP 498 / MECH 498	INTRODUCTION TO ROBOTICS	
LING 430	COMPUTATIONAL LINGUISTICS	
MDHM 359	RESPONSIBLE AI FOR HEALTH	
PSYC 439	ADVANCED STATISTICAL METHODS FOR PSYCHOLOGY UNDERGRADUATES	
SMGT 431	ADVANCED SPORT ANALYTICS	
SMGT 440	SPORT BUSINESS ANALYTICS	
SOCI 460	SPATIAL ANALYSIS IN THE SOCIAL SCIENCES	
SOCI 483	DATA ANALYSIS	
STAT 405	R FOR DATA SCIENCE	
STAT 410	LINEAR REGRESSION	
STAT 411	ADVANCED STATISTICAL METHODS	
STAT 419	STATISTICAL INFERENCE	
STAT 421	APPLIED TIME SERIES AND FORECASTING	
STAT 423	PROBABILITY IN BIOINFORMATICS AND GENETICS	
STAT 425	INTRODUCTION TO BAYESIAN INFERENCE	
STAT 449	QUANTITATIVE FINANCIAL RISK MANAGEMENT	
STAT 453	BIOSTATISTICS	
STAT 482	QUANTITATIVE FINANCIAL ANALYTICS	
STAT 486	MARKET MODELS	
STAT 487	COFES BLOCKCHAIN AND CRYPTOCURRENCIES	

Footnotes and Additional Information

[1] In certain instances, the DSCI Official Certifier may approve various or specific course substitutions. Courses at the 300-level (or above), other than those listed as *Department Approved Electives*, might also be allowed to fulfill the Elective Requirement, with approval from the Minor Advisor.

Policies for the Minor in Data Science

Program Restrictions and Exclusions

Students pursuing the minor in Data Science should be aware of the following program restrictions:

- As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), i.) students may declare their intent to pursue a minor only after they have first declared a major, and ii.) students may not major and minor in the same subject.

Transfer Credit

For Rice University's policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/). Some departments and programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the designated transfer credit advisor for the appropriate academic department offering the Rice equivalent course (corresponding to the subject code of the course content). The Office of Academic Advising maintains the university's official list of transfer credit advisors (https://oaa.rice.edu/advising-network/transfer-credit-advisors/) on their website: https://oaa.rice.edu. Students are encouraged to meet with the applicable transfer credit advisor as well as their academic program director when considering transfer credit possibilities.

Additional Information

For additional information, please see the Data Science website: https://datascience.rice.edu/.

Opportunities for the Minor in Data Science

Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see Latin Honors (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (*summa cum laude*, *magna cum laude*, and *cum laude*) and Distinction in Research and Creative Work (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/). Some departments have department-specific Honors awards or designations.

Additional Information

For additional information, please see the Data Science website: https://datascience.rice.edu/.