Data Fluency

The Certificate in Data Fluency provides a formal pathway for undergraduates in concentrations other than applied mathematics, computational biology, computer science, math, and statistics who wish to gain fluency and facility with the tools of data science. The driving intellectual question is how we can infer meaning from data whilst avoiding false predictions. The required experiential learning component provides students with the opportunity to apply their data-science skills in applied settings, engage in research that uses data science, teach data science as an undergraduate teaching assistant, or undertake an internship that has a substantive data-science component.

As with all undergraduate certificates (https://www.brown.edu/academics/college/degree/undergraduatecertificates/), the certificate has the following requirements:

- Students may not earn more than **one certificate** and may only have **one declared concentration**.
- Students must be enrolled in or have completed at least **two courses** toward the certificate at the time they declare in ASK.
- No more than **one course** may count toward your concentration and the certificate.
- Students may declare in ASK **no earlier** than the beginning of the fifth semester and must declare **no later** than the last day of classes of the antepenultimate (typically the sixth) semester, in order to facilitate planning for the capstone or other experiential learning opportunity.
- Students must submit a proposal for their experiential learning opportunity by the end of the **sixth semester**.

Excluded Concentrations: Applied Mathematics, Computational Biology, Computer Science, Mathematics, and Statistics (including joint concentrations in these areas).

For more information on the Certificate in Data Fluency, please visit the Data Science Institute (https://dsi.brown.edu/academics/certificate-data-fluency/) website.

Certificate Requirements

Core Courses:		
DATA 0080	Data, Ethics and Society	1
CSCI 0111	Computing Foundations: Data	1
or CSCI 0150	Introduction to Object-Oriented Programming and Computer Science	
or CSCI 0170	Computer Science: An Integrated Introduction	
or CSCI 0190	Accelerated Introduction to Computer Science	
or CLPS 0950	Introduction to programming	
DATA 0200	Data Science Fluency	1
Elective Course: Select one follow-up Applied Math, Biostatistics, Computer Science or domain-specific course with a significant data component from the following list (or another course with approval from the certificate advisor):		1
ANTH 1201	Introduction to Geographic Information Systems and Spatial Analysis	
APMA 1650	Statistical Inference I	
BIOL 0495	Statistical Analysis of Biological Data	
BIOL 1555	Methods in Informatics and Data Science for Health	
BIOL 1565	Survey of Biomedical Informatics	
CLPS 0900	Statistical Methods	
CLPS 1291	Computational Methods for Mind, Brain and Behavior	
CLPS 1580C	Visualizing Information	
CSCI 1450	Advanced Introduction to Probability for Computing and Data Science	
CSCI 1470	Deep Learning	
CSCI 1951A	Data Science	
DATA 1150	Data Science Fellows [1]	
ECON 1620	Introduction to Econometrics	
ECON 1660	Big Data	
EDUC 1230	Applied Statistics for Ed Research and Policy Analysis	
ENVS 1105	Introduction to Environmental GIS	
EEPS 1320	Introduction to Geographic Information Systems for Environmental Applications	
EEPS 1330	Global Environmental Remote Sensing	
MATH 1610	Probability	
MUSC 1210	Seminar in Electronic Music: Real-Time Systems	
PHP 1501	Essentials of Data Analysis	
PHP 1510	Principles of Biostatistics and Data Analysis	
SOC 1020	Methods of Social Research	
SOC 1100	Introductory Statistics for Social Research	
SOC 1340	Principles and Methods of Geographic Information Systems	
Capstone:		0-1
The required experiential learning component provides students with the opportunity to apply their data-science skills in their concentration, engage in research that uses data science, teach data science as UTAs, or undertake an internship that has a data-science component. The capstone may be completed for credit via an independent study course or not for credit. [2]		
Options for fulfilling this requirement include:		
1. Participate in a Brown University credit experience (i.e. independent study).		
2. Participate in a non-credit experience: summer Internship; TA for data-related course; work with a local organization on a data-related project. A 10-12 page reflective paper is required for this option.		
3. Be a Data Science Fellow. [1]		
Total Credits		**4-5**

[1] Students may complete DATA 1150 and the concurrent Data Science Fellows project to fulfill both the elective and experiential components of the certificate.

[2] Students must submit a proposal for their experiential component by the end of the sixth semester.