DATA SCIENCE, B.S.

The Bachelor of Science in Data Science program prepares students for careers in data science fields through a strong foundation in theory and practice and the broad education gained by the core curriculum. Data science is an evolving interdisciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from data in various forms. It involves the use of computational, statistical, and mathematical tools for analyzing data, as well as subject-area knowledge in fields such as business and healthcare.

Data science is a fast-growing field that will be in high demand throughout the next decade. The proposed guideline for the data science curriculum by a National Science Foundation (NSF) sponsored interdisciplinary panel states, "Data science is inherently interdisciplinary. Working with data requires the mastery of a variety of skills and concepts, including many traditionally associated with the fields of statistics, computer science, and mathematics. Data science blends much of the pedagogical content from all three disciplines, but it is neither the simple intersection nor the superset of the three." A graduate of the Bachelor of Science in Data Science program will possess a diverse range of knowledge, insights, and skills.

Course Requirements

- General Education Course

- Milestone course: a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.

The Core Curriculum is designed to foster critical thinking skills and introduce students to basic domains of thinking that transcend disciplines. The Core applies to all majors. Information on specific classes in the Core can be found at https://www.marshall.edu/gened/.

The B.S. degree program requires 120 credit hours (Cr.) of coursework. Students are advised to pay careful attention to the General Education requirements in consultation with an academic advisor.

Code	Title	Credit Hours
Core Curriculum		
Core 1: Critical Thinking		
FYS 100	First Yr Sem Critical Thinking	3
Critical Thinking Course		3
Critical Thinking Course		3
Core 2		
ENG 101	Beginning Composition	3
ENG 201	Advanced Composition	3
CMM 103	Fund Speech-Communication	3
or CMM 207	Business Communication	
Core II Fine Arts		3
Core II Humanities		3
MTH 229	Calculus/Analytic Geom I (CT)	5
Core II Social Science		3
Core II Natural Science		4
Additional University Requirements		
Writing Intensive		3
Writing Intensive		3
Multicultural or International		3
DS 491	Senior Seminar	2
College Requirements		
Science Course Requirement		7
Mathematics Core		
MTH 220	Discrete Structures	3
MTH 229	Calculus/Analytic Geom I (CT)	5
MTH 230	Calculus/Analytic Geom II	4
MTH 329	Elementary Linear Algebra	3
Computer Science Core		
CS 110	Computer Science I	3
CS 120	Computer Science II	3
CS 210	Data Structures and Algorithms	3
CS 215	Adv Data Struct and Algorithms	3
CS 410	Database Engineering	3
Statistics Core		
STA 345	Applied Prob and Stat	3
STA 412	Regression Analysis	3
STA 420	Nonparametric Statistics	3
STA 426	Stat Methods and Applications	3
STA 435	Statistical Data Mining	3
Data Science Core		
DS 210	Data Science I: Foundations	3
DS 310	Data Science II: Toolkit	3
DS 430	Data Visualization & Analytics	3
DS 450	Machine Learning	3
DS 470	Big Data Analytics	3
Senior Seminar Course with Data-Driven Experience		
DS 491	Senior Seminar	2
Free Electives		**9**
300/400 Level DS, CS, MTH, or STA Electives		5

Semester Plan

- General Education Course

- Milestone course: a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.

First Year

First Semester		**Credit Hours**
FYS 100	First Yr Sem Critical Thinking	3
ENG 101	Beginning Composition	3
CS 110	Computer Science I	3
MTH 229	Calculus/Analytic Geom I (CT)	5
UNI 100	Freshman First Class	1
	Credit Hours	**15**
Second Semester		
Core II Natural Science		4

CMM 103 or CMM 207	Fund Speech-Communication or Business Communication	3
CS 120	Computer Science II	3
MTH 220	Discrete Structures	3
MTH 230	Calculus/Analytic Geom II	4
	Credit Hours	**17**

Second Year

First Semester

ENG 201	Advanced Composition	3
Core II Humanities		3
CS 210	Data Structures and Algorithms	3
MTH 329	Elementary Linear Algebra	3
STA 345	Applied Prob and Stat	3
	Credit Hours	**15**

Second Semester

Multicultural or International		3
Core II Social Science		3
CS 215	Adv Data Struct and Algorithms	3
Physical/Natural Science		4
DS 210	Data Science I: Foundations	3
	Credit Hours	**16**

Third Year

First Semester

STA 435	Statistical Data Mining	3
DS 310	Data Science II: Toolkit	3
CS 410	Database Engineering	3
Writing Intensive		3
STA 426	Stat Methods and Applications	3
	Credit Hours	**15**

Second Semester

Physical/Natural Science		3
Writing Intensive		3
STA 420	Nonparametric Statistics	3
DS 450	Machine Learning	3
300/400 Level Elective		3
	Credit Hours	**15**

Fourth Year

First Semester

DS 430	Data Visualization & Analytics	3
STA 412	Regression Analysis	3
Core 2 Fine Arts		3
300/400 Level Elective		2
Free Elective		3
	Credit Hours	**14**

Second Semester

DS 470	Big Data Analytics	3
DS 491	Senior Seminar	2
Critical Thinking Course		3
Free Elective		3
Free Elective		3
	Credit Hours	**14**
	Total Credit Hours	**121**