DATA SCIENCE

Data science combines mathematics, statistics, and computer science to discover patterns, solve complex problems, and support informed decision-making. As organizations increasingly rely on data to guide scientific, engineering, business, and public policy decisions, data science has become one of today's most versatile and rapidly growing disciplines.

Students pursuing a bachelor of science degree in data science at Missouri S&T develop strong foundations in mathematics, statistics, computing, and data analysis while learning to acquire, manage, visualize, model, and communicate data effectively. Through coursework and applied experiences, students learn to use modern computational and statistical tools to solve real-world problems across a wide variety of disciplines.

Through your studies at Missouri S&T, you will gain both the theoretical understanding and practical experience needed to transform data into meaningful insights. Graduates are prepared for careers in industry, government, healthcare, finance, manufacturing, technology, and research, or for continued study in graduate and professional programs.

Bachelor of Science
Data Science

The B.S. in Data Science curriculum is designed to give students an interdisciplinary educational experience that provides a solid foundation in computer science, mathematics, and statistics. The curriculum prepares students to solve challenging data-driven problems across a variety of application areas. Students pursuing the B.S. in Data Science must declare an emphasis area in either Computer Science or Mathematics and Statistics. Courses within the emphasis areas provide more advanced discipline-specific content. Students can pursue interests aligned with specific data science applications (e.g., biology, business, economics) through free elective courses.

A minimum of 120 credit hours is required for a bachelor of science degree in Data Science. A minimum grade of "C" is required in each computer science, mathematics, and statistics course counted toward the B.S. in Data Science. These requirements for the B.S. degree are in addition to credit received for algebra, trigonometry, and basic ROTC.

Freshman Year

First Semester	Credits	Second Semester	Credits
Basic ROTC (if elected)[12]	0	Basic ROTC (if elected)[12]	0
COMP SCI 1500[1]	3	Behavioral and Social Sciences Requirement[6,9]	3
ECON 1100 or 1200	3	COMP SCI 1200[1]	3
ENGLISH 1120	3	COMP SCI 1570[1]	3
MATH 1101 or FR ENG 1100[1]	1	COMP SCI 1580[1]	1
MATH 1214 or 1211[1]	4	ENGLISH 1160 or SPM S 1185[4]	3
Natural Science Elective[5]	3	MATH 1215[1]	4
	17		**17**

Sophomore Year

First Semester	Credits	Second Semester	Credits
Basic ROTC (if elected)[12]	0	Basic ROTC (if elected)[12]	0
COMP SCI 1575[1]	3	COMP SCI 2300[1]	3
COMP SCI 1585[1]	1	COMP SCI 2500[1]	3
MATH 2222[1]	4	Humanities and Fine Arts Requirement[7,9]	3
Natural Science Elective with Laboratory [5]	4	MATH 3108[1]	3
Statistics Requirement[1,3]	3	STAT 5346 or COMP SCI 5204[1]	3
	15		**15**

Junior Year

First Semester	Credits	Second Semester	Credits
COMP SCI 3402[1]	3	Electives[2,11]	6
Electives - Emphasis Area[1,2]	6	Electives - Emphasis Area[1,2]	6
Humanities and Fine Arts Requirement[7,9]	3	Humanities, Arts, and Social Sciences Requirement[8,9]	3
STAT 5353[1]	3		
	15		**15**

Senior Year

First Semester	Credits	Second Semester	Credits
Electives - Emphasis Area[1,2]	6	Electives - Data Science[1,2,10]	3
Electives[2,11]	8	Electives[2,11]	9
	14		**12**

Total Credits: 120

1 A minimum grade of "C" is required in each computer science, mathematics, and statistics course counted toward the B.S. in Data Science.

2 No course may be used to satisfy more than one degree requirement, except as otherwise noted.

3 The Statistics Requirement may be met by STAT 3113, STAT 3115, or STAT 3117.

4 May also be satisfied by ENGLISH 3560.

5 Natural sciences courses must be chosen from at least two specific disciplines: Biological Sciences (BIO SCI 1113 or higher), Chemistry (CHEM 1301 or higher), Geology (GEOLOGY 1110 or higher), or Physics (PHYSICS 1111 or higher). At least one credit hour of lab is required. COMP SCI 5700 in the Computer Science emphasis area requires BIO SCI 1113 or BIO SCI 1213, which can be met as part of the Natural Sciences courses in the general education requirements.

6 The Behavioral and Social Sciences Requirement may be met by selecting one course from FRENCH 1101, FRENCH 1102, FRENCH 1180, GERMAN 1101, GERMAN 1102, GERMAN 1180, HISTORY 1100, HISTORY 1200, HISTORY 2110, PHILOS 1105, PHILOS 1115, POL SCI 1200, PSYCH 1101, RUSSIAN 1101, RUSSIAN 1102, RUSSIAN 1180, SPANISH 1101, SPANISH 1102, or SPANISH 1180.

7 The Humanities and Fine Arts Requirement may be met by selecting two courses from two different disciplines from HISTORY 1300, HISTORY 1310, HISTORY 2510, ART 1180, ART 3203, MUSIC 1150, THEATRE 1150, THEATRE 1190, ENGLISH 1211, ENGLISH 1212, ENGLISH 1221, ENGLISH 1222, ENGLISH 1231, ENGLISH 2230, ENGLISH 2232, ENGLISH 2240, ENGLISH 2250.

8 The Humanities, Arts, and Social Sciences Requirement may be met by selecting three additional credit hours from History, Art, Music, Theater, English and Technical Communication, Philosophy, Political Science, Psychology, Economics, Etymology, or Foreign Languages.

9 When selecting courses to fulfill the Behavioral and Social Science Requirement, the Humanities and Fine Arts Requirement, and the Humanities, Arts, and Social Sciences Requirement, you must select at

least one course from HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200 to satisfy the Williams Law requirement.

[10] The Data Science elective course may be selected from the following: COMP SCI 3200, COMP SCI 5206, COMP SCI 5300, COMP SCI 5400, COMP SCI 5401, COMP SCI 5402, COMP SCI 5411, COMP SCI 5420, COMP SCI 5421, COMP SCI 5700, ECON 5360, ECON 5380, ENG MGT 5414, MATH 3109, MATH 3304, MATH 5107, MATH 5601, MATH 5604, MATH 5670, MATH 5680, MATH 5737, MATH 5762, STAT 4210, STAT 5210, STAT 5270, STAT 5290, STAT 5364, STAT 5643, STAT 5644, STAT 5814, IS&T 5450, IS&T 5520.
No course may be used to satisfy more than one requirement in the B.S. in Data Science degree curriculum.

[11] Sufficient free electives to earn a minimum of 120 credit hours.

[12] Basic ROTC may be elected in the freshman and sophomore years, but is not creditable toward a degree. Up to six credit hours of advanced ROTC may be credited as free electives towards a degree.

Emphasis Areas

Computer Science Emphasis Area

Required courses:

COMP SCI 5206	Probability and Its Applications in Computing	3
COMP SCI 5400	Introduction To Artificial Intelligence	3
COMP SCI 5420	Introduction to Machine Learning	3
or COMP SCI 5402	Introduction to Data Mining	
COMP SCI 5421	Reinforcement Learning	3
COMP SCI 5480	Deep Learning	3
COMP SCI 5700	Bioinformatics	3

Mathematics and Statistics Emphasis Area

Required courses:

STAT 5643	Probability And Statistics	3
STAT 5644	Mathematical Statistics	3
MATH 5670	Scientific Programming with Python	3
Select three of the following:		
MATH 3109	Foundations Of Mathematics	3
MATH 5680	Mathematics of Machine Learning	3
STAT 4210	Introduction to Statistical Data Science	3
STAT 5364	Causal Data Science	3