MATHEMATICAL DATA SCIENCES (BS)

Education, Democracy, and Social Change

Mathematical Data Sciences is an interdisciplinary mathematics program that emphasizes computer science, experimentation, and data collection. Mathematics provides students with methods and theory that live at the heart of problem solving and data analysis in the physical sciences, engineering, and innovative industries. Combining mathematics with computer science gives students the practical skills necessary to employ their theoretical mathematics knowledge and develop algorithms to address problems in the real world. Students in Mathematical Data Sciences will also complete 16 to 23 credits in an enrichment option of their choice. The enrichment option gives students experience in a particular field where mathematics and computer science can be applied, and the background to properly implement their skills.

Degree Requirements

Course	Title	Credits
Major Requirements		
CS 2370	Introduction to Programming	4
CS 2381	Data Structures and Intermediate Programming	4
CS 3221	Algorithm Analysis	4
CS 3600	Database Management Systems & Security	4
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
MA 2560	Calculus II (QRCO)	4
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 3355	Introduction to Mathematical Modeling (TECO)	4
MA 3540	Calculus III	4
MA 3600	Differential Equations with Linear Algebra	4
MA 4510	Introduction to Analysis	3
Complete one course from the following:		**3**
MA 3280	Regression Analysis	
MA 3500	Probability and Statistics for Scientists	
Complete one course from the following:		**3-4**
CS 4520	CyberEthics (DICO,WRCO)	
CJ 3157	Society, Ethics, and the Law (DICO)	
		3-4
Option Requirements		**30-41**
Complete one of the following required options:		
Biology		
Chemistry		
Criminal Justice		
Physical Meteorology		
Psychology		
Weather Analysis		
Total Credits		**85-98**

Biology Option of BS in Mathematical Data Sciences

Through the Mathematical Data Sciences major with the Biology option, students learn fundamental biology and chemistry, and then focus on genetics and conservation. This degree prepares students for a career or graduate study in computational bioinformatics, genomics, neurobiology, and other interdisciplinary biology and mathematics fields.

Course	Title	Credits
Option Requirements		
BI 1110	Biological Science I (TECO)	4
BI 1120	Biological Science II	4
BI 3060	Genetics	4
BI 3240	Conservation (DICO,GACO)	3
BI 4980	Biology Seminar	2
CH 2335	General Chemistry I (QRCO)	4
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI)	Directions should total 16 credits because SIDI is waived for BS Mathematical Data Sciences, Biology Option.	
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3-4
INCP (https://coursecatalog.plymouth.edu/general-education/#INCP)	Integrated Captsone	3-4
Elective		14-17

Chemistry Option of BS in Mathematical Data Sciences

Through the Mathematical Data Sciences major with the Chemistry option, students learn general chemistry and organic chemistry. Students then can choose to further study organic chemistry or to instead focus on instrumentation or quantum mechanics. This degree prepares students for a career or graduate study in analytical chemistry, forensics, and other interdisciplinary chemistry and mathematics fields.

Course	Title	Credits
Option Requirements		
CH 1050	Laboratory Safety	1
CH 2335	General Chemistry I (QRCO)	4
CH 2255	Techniques in Laboratory	3
CH 2340	General Chemistry II	4
CH 3370	Organic Chemistry I	4
Choose one course from the following:		**4**
CH 3550	Instrumental Analysis (TECO,WRCO)	
CH 3380	Organic Chemistry II	
CH 3465	Physical Chemistry: Quantum Mechanics and Spectroscopy	
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3-4
INCP (https://coursecatalog.plymouth.edu/general-education/#INCP)	Integrated Capstone	3-4
Elective		15-18
Total Credits		**65-78**

[1] Directions should total 16 credits because SIDI is waived for BS Mathematical Data Sciences, Chemistry Option.

Criminal Justice Option of BS in Mathematical Data Sciences

Criminal Justice is an inherently interdisciplinary field, and the Mathematical Data Sciences major with the Criminal Justice option prepares students for the analytical aspect of Criminal Justice. Students have a choice of electives that prepare them for a career in law, government agencies, and private industries. Future career possibilities include criminologist, criminal intelligence analyst, forensic scientist, and criminal investigator.

Course	Title	Credits
Option Requirements		
CJ 3025	Forensic Science	4
CJ 2090	Criminal Law	4
Choose two courses from the following:		**12**
CJ 2025	Police and society	
CJ 2080	Crime and Criminals	
CJ 3005	Criminal Investigation	
CJ 3015	Cybercrime	
CJ 3405	Homeland Security	
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3-4
INCP (https://coursecatalog.plymouth.edu/general-education/#INCP)	Integrated Capstone	3-4

Elective	14-17
Total Credits	**64-77**

[1] Directions should total 16 credits because SIDI is waived for BS Mathematical Data Sciences, Criminal Justice Option.

Physical Meteorology Option of BS in Mathematical Data Sciences

Meteorology is an inherently interdisciplinary field. Through the Mathematical Data Sciences major with the Physical Meteorology option, students learn fundamental physics and atmospheric science.   Students choose an elective that focuses on the physics of either atmospheric motions or precipitation and solar radiation. This degree prepares students for a career or graduate study in meteorology, physical meteorology, and applied mathematics.

Course	Title	Credits
Option Requirements		
PH 2510	University Physics I	4
PH 2520	University Physics II	4
MT 2000	Fundamentals of Meteorology and Climatology (GACO)	3
MT 3230	Atmospheric Thermodynamics	3
Choose one course from the following:		**3**
MT 4310	Dynamic Meteorology I	
MT 4410	Atmospheric Physics	
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3-4
INCP (https://coursecatalog.plymouth.edu/general-education/#INCP)	Integrated Capstone	3-4

[1] Directions should total 16 credits because SIDI is waived for BS Mathematical Data Sciences, Physical Meteorology Option.

Elective	16-19
Total Credits	**60-72**

Psychology Option of BS in Mathematical Data Sciences

Through the Mathematical Data Sciences major with the Psychology option, students learn general, cognitive, and learning psychology, and then focus on psychological measurement. This degree prepares students for a career or graduate study in psychology, quantitative psychology, neuroscience, market research, and other interdisciplinary psychology and mathematics fields.

Course	Title	Credits
Option Requirements		
PS 2015	Introduction to General Psychology	4
PS 3210	Learning	4
PS 3220	Cognitive Psychology	4
PS 4445	Psychological Measurement	4
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3-4
INCP (https://coursecatalog.plymouth.edu/general-education/#INCP)	Integrated Capstone	3-4

Elective		16-18
Total Credits		**62-74**

[1] Directions should total 16 credits because SIDI is waived for BS Mathematical Data Sciences, Psychology Option.

Weather Analysis Option of BS in Mathematical Data Sciences

Meteorology is an inherently interdisciplinary field. Through the Mathematical Data Sciences major with the Weather Analysis option, students learn fundamental physics and atmospheric science. Students then have a choice of electives that focus on weather and instrumentation. This degree prepares students for a career or graduate study in meteorology, weather analysis, insurance analysis, and other fields in meteorology and applied mathematics.

Course	Title	Credits
Option Requirements		
MT 2000	Fundamentals of Meteorology and Climatology (GACO)	3
MT 2250	Introduction to Weather Analysis and Forecasting	4
MT 3230	Atmospheric Thermodynamics	3
PH 2510	University Physics I	4
MT 3725	Instruments and Observations in Meteorology	3
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CTDI (https://coursecatalog.plyr general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plyr general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
WECO (https://coursecatalog.plyr general-education/#WECO)	Wellness Connection	3-4
INCP (https://coursecatalog.plymouth.edu/general-education/#INCP)	Integrated Capstone	3-4
Elective		15-22
Total Credits		**59-75**

[1] Directions should total 16 credits because SIDI is waived for BS Mathematical Data Sciences, Weather Analysis Option.

Recommended Course Sequence

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

To complete the bachelor's degree in 4 years, you must successfully complete a minimum of 15 credits each semester or have a plan to make up credits over the course of the 4 years. For example, if you take 14 credits one semester, you need to take 16 credits in another semester. Credits completed must count toward your program requirements (major, option, minor, certificate, general education or free electives).

Required Options in this Major

Complete One Option

Biology Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for as an odd start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
IS 1115	Tackling a Wicked Problem	4
EN 1400	Composition	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
WECO (https://coursecatalog.plymou general-education/#WECO)	Wellness Connection	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
BI 1110	Biological Science I (TECO)	4
CH 2335	General Chemistry I (QRCO)	4
	Credits	**16**
Spring		
MA 3540	Calculus III	4

Course	Title	Credits
CS 2381	Data Structures and Intermediate Programming	4
BI 1120	Biological Science II	4
BI 4980	Biology Seminar	2
	Credits	**14**
Year Three		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 3600	Database Management Systems & Security	4
BI 3060	Genetics	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
	Credits	**16**
Spring		
CS 3221	Algorithm Analysis	4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	4
Elective		8
	Credits	**16**
Year Four		
Fall		
MA 4510	Introduction to Analysis	3
BI 3240	Conservation (DICO,GACO)	3
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
	Credits	**12-14**
Spring		
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
Elective		11
	Credits	**14**
	Total Credits	**120**

Biology Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for as an even start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	4
	Credits	**17-19**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
BI 1110	Biological Science I (TECO)	4
CH 2335	General Chemistry I (QRCO)	4
	Credits	**16**
Spring		
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
BI 1120	Biological Science II	4
CH 2340	General Chemistry II	4
	Credits	**16**
Year Three		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 3600	Database Management Systems & Security	4
BI 3060	Genetics	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
	Credits	**16**
Spring		
CAMS Math elective		3
CS 3221	Algorithm Analysis	4
Elective		8
	Credits	**15**
Year Four		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
BI 3240	Conservation (DICO,GACO)	3
CAMS Ethics course		3-4
Elective		3-4
	Credits	**13-15**

Spring

Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
Electives		6
	Credits	**10**
	Total Credits	**120**

Chemistry Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for an odd start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
SSDI (https://coursecatalog.plymou general-education/ #SSDI)	Self and Society Direction	4
CTDI (https://coursecatalog.plymouth.edu/ general-education/ #CTDI)	Creative Thought Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
PPDI (https://coursecatalog.plymouth.edu/ general-education/ #PPDI)	Past and Present Direction	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
	Credits	**16**
Spring		
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
GACO (https://coursecatalog.plymou general-education/ #GACO)	Global Awareness Connection	4

WECO (https://coursecatalog.plymouth.edu/ general-education/ #WECO)	Wellness Connection	4
	Credits	**16**
Year Three		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 3600	Database Management Systems & Security	4
CH 2335	General Chemistry I (QRCO)	4
CH 1050	Laboratory Safety	1
Elective		3
	Credits	**16**
Spring		
MA 3600	Differential Equations with Linear Algebra	4
CH 2340	General Chemistry II	4
CH 2255	Techniques in Laboratory	3
CS 3221	Algorithm Analysis	4
Elective		3
	Credits	**18**
Year Four		
Fall		
MA 4510	Introduction to Analysis	3
CH 3370	Organic Chemistry I	4
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
Elective		3-4
	Credits	**13-15**
Spring		
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
CH 3550 or CH 3380 or CH 3465	Instrumental Analysis (TECO,WRCO) or Organic Chemistry II or Physical Chemistry: Quantum Mechanics and Spectroscopy	4
Elective		3-4
	Credits	**10-11**
	Total Credits	**120**

Chemistry Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for an even start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4

IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
WECO (https://coursecatalog.plymou general-education/ #WECO)	Wellness Connection	4
CTDI (https://coursecatalog.plymouth.edu/ general-education/ #CTDI)	Creative Thought Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
GACO (https://coursecatalog.plymou general-education/ #GACO)	Global Awareness Connection	3-4
CH 2335	General Chemistry I (QRCO)	4
CH 1050	Laboratory Safety	1
Elective		3
	Credits	**15-16**
Spring		
MA 3540	Calculus III	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
CH 2340	General Chemistry II	4
CH 2255	Techniques in Laboratory	3
Elective		1
	Credits	**16**
Year Three		
Fall		
MA 4510	Introduction to Analysis	3
CS 2370	Introduction to Programming	4
PPDI (https://coursecatalog.plymouth.edu/ general-education/ #PPDI)	Past and Present Direction	4
SSDI (https://coursecatalog.plymou general-education/ #SSDI)	Self and Society Direction	4
	Credits	**15**
Spring		
MA 3600	Differential Equations with Linear Algebra	4
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3

CH 3550 or CH 3380 or CH 3465	Instrumental Analysis (TECO,WRCO) or Organic Chemistry II or Physical Chemistry: Quantum Mechanics and Spectroscopy	4
CS 2381	Data Structures and Intermediate Programming	4
Elective		1
	Credits	**16**
Year Four		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
CS 3600	Database Management Systems & Security	4
Elective		3-4
	Credits	**14-16**
Spring		
Elective		9-12
CS 3221	Algorithm Analysis	4
	Credits	**13-16**
	Total Credits	**120**

Criminal Justice Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for an odd start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
WECO (https://coursecatalog.plymou general-education/ #WECO)	Wellness Connection	4
CTDI (https://coursecatalog.plymouth.edu/ general-education/ #CTDI)	Creative Thought Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4

PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	4
	Credits	**12**
Spring		
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4-8
	Credits	**16-20**
Year Three		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 3600	Database Management Systems & Security	4
CJ 2090	Criminal Law	4
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	4
	Credits	**16**
Spring		
MA 3600	Differential Equations with Linear Algebra	4
CJ 2080 or CJ 2025 or CJ 3005 or CJ 3015 or CJ 3025 or CJ 3405	Crime and Criminals or Police and society or Criminal Investigation or Cybercrime or Forensic Science or Homeland Security	4
CS 3221	Algorithm Analysis	4
Elective		4
	Credits	**16**
Year Four		
Fall		
MA 4510	Introduction to Analysis	3
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
CJ 2080 or CJ 2025 or CJ 3005 or CJ 3015 or CJ 3025 or CJ 3405	Crime and Criminals or Police and society or Criminal Investigation or Cybercrime or Forensic Science or Homeland Security	4
Elective		3-4
	Credits	**13-15**
Spring		
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3

CJ 2080 or CJ 2025 or CJ 3005 or CJ 3015 or CJ 3025 or CJ 3405	Crime and Criminals or Police and society or Criminal Investigation or Cybercrime or Forensic Science or Homeland Security	4
Elective		5-6
	Credits	**12-13**
	Total Credits	**120**

Criminal Justice Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for an even start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
WECO (https://coursecatalog.plymou general-education/#WECO)	Wellness Connection	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
	Credits	**16**
Spring		
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
SSDI (https://coursecatalog.plymou general-education/#SSDI)	Self and Society Direction	4

Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
	Credits	**16**
Year Three		
Fall		
MA 4510	Introduction to Analysis	3
CS 3600	Database Management Systems & Security	4
CJ 2090	Criminal Law	4
GACO (https://coursecatalog.plymou general-education/#GACO)	Global Awareness Connection	4
	Credits	**15**
Spring		
MA 3600	Differential Equations with Linear Algebra	4
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
CJ 2080 or CJ 2025 or CJ 3005 or CJ 3015 or CJ 3025 or CJ 3405	Crime and Criminals or Police and society or Criminal Investigation or Cybercrime or Forensic Science or Homeland Security	4
Elective		6
	Credits	**17**
Year Four		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
CJ 2080 or CJ 2025 or CJ 3005 or CJ 3015 or CJ 3025 or CJ 3405	Crime and Criminals or Police and society or Criminal Investigation or Cybercrime or Forensic Science or Homeland Security	4
Elective		3-4
	Credits	**14-16**
Spring		
CJ 2080 or CJ 2025 or CJ 3005 or CJ 3015 or CJ 3025 or CJ 3405	Crime and Criminals or Police and society or Criminal Investigation or Cybercrime or Forensic Science or Homeland Security	4
CS 3221	Algorithm Analysis	4
Elective		3-4
	Credits	**11-12**
	Total Credits	**120**

Physical Meteorology Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for an odd start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
CTDI (https://coursecatalog.plymou general-education/#CTDI)	Creative Thought Direction	4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
PH 2510	University Physics I	4
SSDI (https://coursecatalog.plymou general-education/#SSDI)	Self and Society Direction	4
	Credits	**16**
Spring		
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
PH 2520	University Physics II	4
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
	Credits	**15-16**
Year Three		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 3600	Database Management Systems & Security	4
MT 2000	Fundamentals of Meteorology and Climatology (GACO)	3

Course	Title	Credits
WECO (https://coursecatalog.plymou general-education/ #WECO)	Wellness Connection	3
	Credits	**14**
Spring		
CS 3221	Algorithm Analysis	4
MT 3230	Atmospheric Thermodynamics	3
MA 3600	Differential Equations with Linear Algebra	4
Elective		4
	Credits	**15**
Year Four		
Fall		
MA 4510	Introduction to Analysis	3
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
MT 4310 or MT 4410	Dynamic Meteorology I or Atmospheric Physics	3
Elective		4-6
	Credits	**13-16**
Spring		
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		3
Elective		10
	Credits	**16**
	Total Credits	**120**

Physical Meteorology Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for an even start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
CTDI (https://coursecatalog.plymou general-education/ #CTDI)	Creative Thought Direction	4
PPDI (https://coursecatalog.plymouth.edu/general-education/ #PPDI)	Past and Present Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
PH 2510	University Physics I	4
SSDI (https://coursecatalog.plymou general-education/ #SSDI)	Self and Society Direction	4
	Credits	**16**
Spring		
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
PH 2520	University Physics II	4
GACO (https://coursecatalog.plymouth.edu/ general-education/ #GACO)	Global Awareness Connection	3
	Credits	**15**
Year Three		
Fall		
MA 4510	Introduction to Analysis	3
CS 3600	Database Management Systems & Security	4
MT 2000	Fundamentals of Meteorology and Climatology (GACO)	3
WECO (https://coursecatalog.plymou general-education/ #WECO)	Wellness Connection	3
	Credits	**13**
Spring		
CS 3221	Algorithm Analysis	4
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
MT 3230	Atmospheric Thermodynamics	3
MA 3600	Differential Equations with Linear Algebra	4
Elective		3
	Credits	**17**
Year Four		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
MT 4310 or MT 4410	Dynamic Meteorology I or Atmospheric Physics	3
Elective		0-2

Elective		3
Credits		**13-16**
Spring		
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		3-4
Elective		12
Credits		**15-16**
Total Credits		**120**

Psychology Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for as an odd start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
CTDI (https://coursecatalog.plymou general-education/#CTDI)	Creative Thought Direction	4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		3-4
	Credits	**15-16**
Spring		
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
PS 2015	Introduction to General Psychology	4

Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
Credits		**16**
Year Three		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 3600	Database Management Systems & Security	4
PS 3210	Learning	4
GACO (https://coursecatalog.plymou general-education/#GACO)	Global Awareness Connection	3-4
Credits		**15-16**
Spring		
MA 3600	Differential Equations with Linear Algebra	4
PS 3220	Cognitive Psychology	4
CS 3221	Algorithm Analysis	4
Elective		4
Credits		**16**
Year Four		
Fall		
MA 4510	Introduction to Analysis	3
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
PS 4440		3
Elective		4-6
Credits		**13-16**
Spring		
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3
Elective		7-8
Credits		**13-14**
Total Credits		**120**

Psychology Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for as an even start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**

Spring

MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
CTDI (https://coursecatalog.plymou general-education/#CTDI)	Creative Thought Direction	4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	4
	Credits	**15**

Year Two

Fall

MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
SSDI (https://coursecatalog.plymou general-education/#SSDI)	Self and Society Direction	4
	Credits	**16**

Spring

MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
PS 2015	Introduction to General Psychology	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		4
	Credits	**16**

Year Three

Fall

MA 4510	Introduction to Analysis	3
CS 3600	Database Management Systems & Security	4
PS 3210	Learning	4
GACO (https://coursecatalog.plymou general-education/#GACO)	Global Awareness Connection	4
	Credits	**15**

Spring

CS 3221	Algorithm Analysis	4
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
PS 3220	Cognitive Psychology	4
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	4
	Credits	**15**

Year Four

Fall

MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3
PS 4440		3
Elective		4-6
	Credits	**14-16**

Spring

MA 3600	Differential Equations with Linear Algebra	4
Elective		9
	Credits	**13**
	Total Credits	**120**

Weather Analysis Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for as an odd start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
CTDI (https://coursecatalog.plymou general-education/#CTDI)	Creative Thought Direction	4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
PH 2510	University Physics I	4
SSDI (https://coursecatalog.plymou general-education/#SSDI)	Self and Society Direction	4
	Credits	**16**

Spring

Course	Title	Credits
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		3-4
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
	Credits	**14-16**

Year Three

Fall

Course	Title	Credits
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 3600	Database Management Systems & Security	4
MT 2000	Fundamentals of Meteorology and Climatology (GACO)	3
MT 2250	Introduction to Weather Analysis and Forecasting	4
Elective		3
	Credits	**18**

Spring

Course	Title	Credits
MA 3600	Differential Equations with Linear Algebra	4
MT 3230	Atmospheric Thermodynamics	3
CS 3221	Algorithm Analysis	4
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3-4
Elective		3
	Credits	**17-18**

Year Four

Fall

Course	Title	Credits
MA 4510	Introduction to Analysis	3
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3
MT 3725	Instruments and Observations in Meteorology	3
Elective		3-4
	Credits	**12-13**

Spring

Course	Title	Credits
MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
Elective		8
	Credits	**11**
	Total Credits	**120**

Weather Analysis Option of BS in Mathematical Data Sciences

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Please use the following sequence for as an even start year:

Course	Title	Credits
Year One		
Fall		
MA 2450	Mathematical Reasoning	4
MA 2550	Calculus I (QRCO)	4
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
	Credits	**16**
Spring		
MA 2700	Introduction to Mathematical Proof Writing (WRCO)	3
MA 2560	Calculus II (QRCO)	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	4
	Credits	**15**
Year Two		
Fall		
MA 3600	Differential Equations with Linear Algebra	4
CS 2370	Introduction to Programming	4
PH 2510	University Physics I	4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	4
	Credits	**16**
Spring		
MA 3540	Calculus III	4
CS 2381	Data Structures and Intermediate Programming	4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/)		3-4
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
	Credits	**14-16**
Year Three		
Fall		
MA 4510	Introduction to Analysis	3
CS 3600	Database Management Systems & Security	4
MT 2000	Fundamentals of Meteorology and Climatology (GACO)	3
MT 2250	Introduction to Weather Analysis and Forecasting	4
Elective		3
	Credits	**17**
Spring		
MA 3600	Differential Equations with Linear Algebra	4
MT 3230	Atmospheric Thermodynamics	3

MA 3280 or MA 3500	Regression Analysis or Probability and Statistics for Scientists	3
WECO (https://coursecatalog.plymou general-education/#WECO)	Wellness Connection	3-4
Elective		3
	Credits	**16-17**
Year Four		
Fall		
MA 3355	Introduction to Mathematical Modeling (TECO)	4
CS 4520 or CJ 3157	CyberEthics (DICO,WRCO) or Society, Ethics, and the Law (DICO)	3-4
MT 3725	Instruments and Observations in Meteorology	3
Elective		3-4
	Credits	**13-15**
Spring		
CS 3221	Algorithm Analysis	4
Elective		8
	Credits	**12**
	Total Credits	**120**

Learning Outcomes

- An ability to apply acquired knowledge, appropriate to the discipline, to solve problems.
- An ability to function effectively on teams to accomplish a common goal.
- An understanding of professional, ethical, legal, security, and social issues and responsibilities.
- An ability to communicate effectively with a wide range of audiences.
- An ability to apply current theory, practice, and skills in the design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices.

Career Pathways

A major in mathematical data sciences is a good preparation for a variety of careers based in the utilization of data. Plymouth State's mathematical data sciences program provides student with sufficient background in mathematical theory, computer skills, and an applied discipline to be able work with the vast quantities of data in the modern business world. Students are prepared for and various types of industry positions, or to pursue graduate work or research.

Sample Jobs include, but are not limited to: Mathematical Scientist, Actuary, Game Designer, Supply Chain Analyst, Retirement Plan Designer, Numerical Analyst, Financial Planner, Data Base Manager, Cryptologist, Forensic Analyst, Computer Research Scientist, Physician, Information Scientist, Bioinformatician, Quality Control Analyst, Economist, Information Systems Analyst, Robotics Engineer, Cost Estimator, Epidemiologist, Software Engineer, Risk Analyst, Claims Specialist, Controller, Quantitative Pharmacologist, Forecast Analyst, Environmental Scientist, Data Engineer, Auditor, Budget Analyst, Systems Modeler,

Methods Developer, Scientific Consultant, Underwriter, Geomagnetic Engineer, Forest/Fisheries Scientist, Mathematical Biologist, Modeler

See the U.S. Department of Labor Outlook for a complete list.

Useful Skills for Jobs in the Mathematics Fields:

- Accuracy and attention to detail
- Strong mathematical and computer skills
- Proficiency in analytical reasoning
- Facility with data and large quantities of information
- Strong organization and communication skills