

Name: _____

Department of Mathematics and Statistics

STATISTICS & DATA SCIENCE MAJOR

At the end of this curriculum a student will:

1. Understand the mathematical foundations of classical and modern statistical and data science methods, as well as gain experience with their software implementations
2. Apply statistical techniques to solve real world problems, including problem formulation, data collection, modeling and analysis, and results interpretation and communication
3. Work in a group/team setting using concepts and methods from statistics and data science and communicate results with stakeholders

Lower Division Requirements

Course	Title	Units	Semesters Offered
Math 131	Calculus I	4	Fall, Winter, Spring, and Summer
Math 132	Calculus II	4	Fall, Winter, Spring, and Summer
Math 233	Calculus III	4	Fall, Winter, Spring, and Summer
Math 235	Linear Algebra	3	Fall, Winter, Spring, and Summer
CICS 110	Programming	4	Fall, Spring, and Summer
Math 370	Junior Year Writing	3	Fall, Spring, and Summer
Stat 310	Fundamental Concepts/Stat	3	Fall and Spring

Upper Division Requirements

Course	Title	Units	Semesters Offered
Stat 315 (previously Stat 515)	Probability	3	Fall, Winter, Spring, and Summer
Stat 416 (previously Stat 516 and Stat 490S)	Statistics	4 (or 3 if Stat 516)	Fall, Spring, and Summer
Stat 525 (IE)	Regression	3	Fall and Spring
Stat 535	Statistical Computing	3	Fall and Spring
ELECTIVE 1*		3	
ELECTIVE 2*		3	
ELECTIVE 3*		3	
ELECTIVE 4*		3	

*Electives

- At least two of the four electives are required to be drawn from STAT 390+, excluding STAT 501 and STAT 517. Recommended STAT electives include
 - STAT 532 (Multivariate Statistical Methods)
 - STAT 526 (Design of Experiments)
 - STAT 530 (Analysis of Discrete Data)
 - STAT 534 (Programming Data Analytics and Visualization)
 - STAT 540 (Introduction to Statistical Learning)
 - STAT 550 (Introduction to Survey Sampling)
 - STAT 590C (Introduction to Causal Inference)
 - STAT 590CT (Clinical Trials)
 - STAT 590D (590D Data-Driven Methods for Inference and Prediction)
 - STAT 598C (Statistical Consulting Practicum)
- At most two of the four electives can be MATH 390+ courses, MATH 300, MATH 331 or approved courses from outside of the department. Pre-approved courses outside of the department are listed here: <https://www.umass.edu/mathematics-statistics/academics/undergraduate/minor#course%20list>. Note that MATH 300 is a necessary prerequisite for some of these courses. Recommended MATH electives include
 - MATH 300 (Fundamental Concepts Of Mathematics)
 - MATH 331 (Ordinary Differential Equations)
 - MATH 456 (Mathematical Modeling)
 - MATH 537 (Introduction to Mathematics of Finance)
 - MATH 545 (Advanced Linear Algebra and Applications)
 - MATH 551 (Introduction to Scientific Computing)
- Students interested in graduate school in statistics and data science are recommended to take the following electives. Note that MATH 300 is a necessary prerequisite for some of these courses, and graduate courses at 600+ level need instructor's permission to enroll.
 - MATH523H (Introduction to Modern Analysis)
 - MATH 524 (Introduction to Modern Analysis II)
 - MATH 545 (Introduction to Scientific Computing)
 - STAT 607 (Mathematical Statistics I)
 - STAT 608 (Mathematical Statistics II)
 - STAT 625 (Regression modeling)

Note: Students interested in 4+1 Masters program in Statistics can apply in their senior year. See details here: <https://www.umass.edu/mathematics-statistics/graduate-degree-statistics>.

Each of the learning objectives is related to a set of courses as follows:

- Learning objective 1) is served by STAT 310, STAT 315, STAT 416, STAT 525, STAT 526, STAT 530, STAT 534, STAT 535, STAT 540, STAT 550, STAT 590C, STAT 590CT, MATH 300, MATH 456, MATH 537, MATH 545, MATH 551
- Learning objective 2) is served by STAT 310, STAT 525, STAT 526, STAT 530, STAT 540, STAT 550, STAT590C, STAT 590CT, STAT 598C, MATH 456, MATH 537
- Learning objective 3) is served by STAT 310, STAT 525, STAT 598C

Total number of courses	15
Total number of credits	50 (or 49 if taking STAT 516)

Sample Degree Plan

	Fall	Spring
Year 1	MATH131	MATH132, CICS110
Year 2	MATH233, STAT310, STAT315	STAT416, MATH235
Year 3	STAT525, STAT535	MATH370, ELECTIVE 1
Year 4	ELECTIVE 2, ELECTIVE 3	ELECTIVE 4

Sample Degree Plan for transfer students

	Fall	Spring
Year 1	STAT 310, STAT 315, MATH 370	STAT 416, STAT 535, ELECTIVE 1
Year 2	STAT 525, ELECTIVE 2	ELECTIVE 3, ELECTIVE 4

Degree Dependency Chart (Solid line means required prerequisites)

