

## STATISTICS B.S.MSC.

### STATISTICS MAJOR

Statistics is a mathematical science extensively used in a wide variety of fields. Indeed, every discipline which gathers and interprets data uses statistical concepts and procedures to understand the information implicit in their data. Statisticians become involved in efforts to solve real world problems by designing surveys and experimental plans, constructing and interpreting descriptive statistics, developing and applying statistical inference procedures, and developing and investigating stochastic models or computer simulations. To investigate new statistical procedures requires a knowledge of mathematics and computing as well as statistical theory. To apply concepts and procedures effectively also calls for an understanding of the field of application and oral/written presentation skills.

The curriculum is designed for students who plan to enter business, industry, or government as statisticians or data scientists; to become professional actuaries; or to continue to graduate school in statistics/biostatistics, data science or another field where quantitative ability is valuable (operations research, medicine, public health, demography, psychology, etc.). Students are encouraged to undertake special projects to gain experience in data analysis, design, and statistical computing. Also, experience may be gained with local industry and other organizations for those interested in quality control, industrial statistics, survey and market research or forecasting, for example.

Students pursuing the Bachelor of Science in Mathematical Sciences in CEMS may select statistics as their major. In addition, students pursuing a Bachelor of Arts from the College of Arts and Sciences may concentrate in statistics as a part of their mathematics major.

### REGULATIONS

Students pursuing the Bachelor of Science in Mathematical Sciences (Majoring in Statistics) are subject to the Academic Standards in CEMS outlined in this catalogue.

#### ADDITIONAL REGULATIONS

No more than three grades of D, D+, or D- in 3000-level (or higher) mathematics (MATH) or statistics (STAT) courses may be used to satisfy “Core Curriculum” and “Major Courses” requirements.

### REQUIREMENTS

All students must meet the Degree and University Requirements.

All students must meet the Catamount Core Curriculum Requirements.

All students must meet the College Requirements.

A minimum of 120 credits is required.

Statistics majors may count no more than two of the following courses toward their degree requirements: STAT 1050, STAT 1110, STAT 1410, and STAT 2430.

Credit not given for more than one of STAT 1410 and STAT 2430. STAT 2430 is recommended.

### A. CORE CURRICULUM

CEMS 1500	CEMS First Year Seminar	1
SPCH 1400	Effective Speaking	3
MATH 1234	Calculus I <sup>1</sup>	4
MATH 1248	Calculus II	4
MATH 2248	Calculus III	4
MATH 2522	Applied Linear Algebra	3
or MATH 2544	Linear Algebra	
CS 1210	Computer Programming I	3
STAT 1410	Basic Statistical Methods 1	3
or STAT 2430	Statistics for Engineering	
STAT 2830	Basic Statistical Methods 2	3
STAT 2870	Basics of Data Science	3
STAT 3010	Stat Computing&Data Anlysis	3
STAT 3210	Advanced Statistical Methods	3
STAT 2510	Applied Probability	3
STAT 3410	Statistical Inference	3
STAT 4810	Capstone Experience	1-8
or STAT 3996	Undergrad Honors Thesis	

<sup>1</sup> A student with a MATH 1234 waiver can use it to fulfill the requirement of MATH 1234 in the Core Curriculum. However, at least three extra credits of mathematics numbered above MATH 1242 must be added to the Major Courses requirement.

### B. MAJOR COURSES

Three additional credits of statistics at the 3000-level or above, so that a total of at least forty-five credits in the core and major classes are earned, and a total of eighteen credits in the core and major classes are at the 3000-level or above.

Given the wide variety of paths after graduation pursued by students graduating with a B.S.MSC. in Statistics, the department does not list specific courses which must be taken to satisfy the Professional Development Electives requirement of the CEMS Core Curriculum. However, students should work with their advisor to find appropriate courses which are consistent with their future career goals.

#### C. Allied Field Courses

Twenty-four credits selected from the following Allied Fields:

1. Physical Sciences
2. Biological Sciences
3. Medical Sciences
4. Engineering
5. Computer Science (CS 2100 or higher)
6. Agricultural Sciences
7. Business Administration
8. Psychology
9. Economics
10. Environmental Sciences/Studies
11. Natural Resources

Students, in consultation with their advisors, must plan a sequence of Allied Field courses consistent with their professional and personal goals. Students interested in pursuing intensive studies in an area not specifically listed are encouraged to plan a program with their advisor and submit it to the appropriate departmental committee for review and approval. The requirements are as follows:

Twenty-four credits selected from the above list of Allied Fields, including at least one laboratory experience in science or engineering. Of these twenty-four credits, at least six must be in courses numbered 2000-level or above, and at least six must be taken in fields 1 to 5. Courses used to satisfy requirement B above may not be used to satisfy this requirement.

### OPTIONAL PRE-MEDICAL CONCENTRATION

Each student electing the Pre-Medical concentration in statistics will fulfill the general requirements for the statistics major. STAT 3000 is recommended as an important elective for students interested in medicine or allied health. In addition, the pre-medical concentration should include, at a minimum:

Two semesters of general chemistry and two semesters of organic chemistry with laboratory:		16
Choose one of the following sequences:		
CHEM 1400 & CHEM 1450	General Chemistry 1 and General Chemistry 2	
CHEM 1500 & CHEM 1550	Organic Chemistry for Majors 1 and Organic Chemistry for Majors 2	
Complete the following sequence:		
CHEM 2580 & CHEM 2585	Organic Chemistry 1 and Organic Chemistry 2	
Choose one of the following physics sequences with laboratory:		7-8
PHYS 1500 & PHYS 1550 & PHYS 1460	Physics for Engineers I and Physics for Engineers II and Elem Physic Problem Solving II	
PHYS 1600 & PHYS 1650	Fundamentals of Physics I and Fundamentals of Physics II	

At least one year of biology with laboratory:		8
BIOL 1400	Principles of Biology 1	
BIOL 1450	Principles of Biology 2	

### DOUBLE MAJOR IN MATHEMATICS AND STATISTICS

Students may earn a double major in mathematics and statistics by meeting the requirements of the statistics major and earning an additional fifteen credits in mathematics, to include:

MATH 2055	Fundamentals of Mathematics	3
Choose two of the following:		6
MATH 3230	Ordinary Diffrentl Equation	
MATH 3737	Intro to Numerical Analysis	
MATH 3468	Anyl in Several Real Vars I	
MATH 3551	Abstract Algebra I	

Note: Student pursuing the double major in mathematics and statistics must earn a total of 120 credits. The above outlined courses must be additional to the courses defined for the stat major (core, major and allied field).