

# BACHELOR OF SCIENCE: MATHEMATICS AND STATISTICS / MASTER OF SCIENCE: MATHEMATICS - DUAL DEGREE

## Student Learning Outcomes

Students graduating from this program will:

- read, write, understand mathematical proofs, and construct mathematical proofs as appropriate.
- reason with and apply mathematical concepts, principles and methods; analyze and evaluate problems (both theoretical and practical) and plan strategies for their solution.
- work collaboratively with others on projects requiring mathematical knowledge and input, to function effectively in a professional workplace related to mathematics, or in a graduate program.
- apply logical reasoning skills towards answering theoretical and conceptual questions of the core areas of mathematics, meaning students will be able to explicate concepts, theorems, and standard proofs, provide and/or analyze relevant examples and counterexamples, and construct logically correct and mathematically rigorous proofs.
- demonstrate quantitative skills by implementing analytical or numerical techniques for a given task, as well as initiating concrete computations and approximations, and demonstrate the ability to carry them out.
- demonstrate qualitative skills, such as the ability to translate real-world problems into mathematical formulations, apply analytical or numerical strategies and techniques, provide exact or approximate solutions or partial solutions to problems as appropriate, and interpret and explain the results as well as the assumptions behind those results.
- demonstrate the ability to prepare background materials or gather data, write and produce one or more revisions seeking out peer or other reviews, and finally write a mathematics or statistics project report, an exposition of mathematics, or create and give an oral presentation tailored to a given audience.

This program offers students an opportunity to meet the full requirements of the BS and MS in a shorter time period than the separate degree programs. The students may complete a Bachelor of Science degree in Mathematics and Statistics in four years and the Master's degree in Statistics the fifth year.

## Admission Requirements

1. The applicant must be a UMKC undergraduate student who has completed a minimum of 60 cumulative credit hours.
2. The applicant should complete the BS/MS application form and submit it to both the undergraduate (baniyaghoubm@umkc.edu (%28baniyaghoubm@umkc.edu)) and graduate advisors (segal@umkc.edu (%28segal@umkc.edu)).
3. The applicant must satisfactorily complete the following courses:
  - a. MATH 300 Linear Algebra I
  - b. MATH 301 On Solid Ground: Sets and Proof, or any 400-level class that has MATH 301 as a prerequisite. For instance, MATH 410, MATH 420, or MATH 402
  - c. MATH 345 Ordinary Differential Equations
4. A minimum overall GPA of 3.0 is required.
5. A minimum GPA of 3.2 in Math/Stat courses is required.

## B.S. Degree Requirements (total of 33 credit hours)

As listed below, there are 24 credit hours required undergraduate courses.

Code	Title	Credits
MATH 210	Calculus I	4
MATH 220	Calculus II	4
MATH 250	Calculus III	4
MATH 300	Linear Algebra I	3
MATH 345 & 345L	Ordinary Differential Equations and Ordinary Differential Equations Lab	4
or select one of the following:		
MATH 406	Partial Differential Equations	
STAT 436	Introduction To Mathematical Statistics I	
MATH 402	Advanced Analysis I	3

MATH 410	Abstract Algebra	3
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The student should also take at least 9 credit hours of Math or Stat elective courses at the 400 level or above.

## M.S. Degree Requirements (total of 30 credit hours)

The following core courses are required for the completion of the M.S. degree:

Code	Title	Credits
MATH 5509	Algebra I	3
MATH 5510	Complex Variables I	3
MATH 5513	Real Variables I	3
MATH 5521	Differential Equations	3
MATH 5532	Numerical Linear Algebra	3
MATH 5545	Mathematical Methods in Data Science	3

Also a total of 12 credit hours of Math or Stat elective courses at the 400 level or above must be completed satisfactorily.

## B.S./M.S. Degree Overlap (up to 9 credit hours)

Up to 9 credit hours of 400-level Math or Stat courses in the graduate degree can overlap with the courses taken towards satisfying the requirements for the undergraduate degree.