

# BACHELOR OF ARTS: MATHEMATICS AND STATISTICS

## University Requirements

### General Education

UMKC Essentials is the university-wide curriculum that all undergraduate students will complete. The 30-credit hour program includes a First Year Experience course; three critical thinking courses in the areas of Arts & Humanities, Natural & Physical Sciences, and Social & Behavioral Sciences; a Culture and Diversity course; a Civic & Urban Engagement course; two courses in Written Composition and one course in Oral Communication; and a Math Pathway course. Transfer students entering UMKC will elect from the UMKC Essentials General Education Program or the Missouri Core 42 General Education Curriculum. Academic advisors will meet with incoming transfer students to determine which option best serves the student's educational needs. More information about General Education may be found here: <https://catalog.umkc.edu/undergraduate-academic-regulations-information/general-education-requirements/> (<http://catalog.umkc.edu/undergraduate-academic-regulations-information/general-education-requirements/>)

### Constitution Course

Every undergraduate student must take a course covering the United States Constitution and the Missouri State Constitution before graduation. Course options are included in the program requirements section below.

### Exit Examinations

Information on exit examinations is available in the Undergraduate Academic Regulations and Information (<http://catalog.umkc.edu/undergraduate-academic-regulations-information/graduation/exitexams/>) section of the catalog.

### Missouri Higher Education Civics Achievement Examination

In accordance with Missouri Senate Bill 807 (section 170.013.1), 'any student entering a public institution of higher education for the first time after July 2019 who is pursuing an associate's or bachelor's degree from such institution shall successfully pass an examination on the provisions and principles of American civics with a score of seventy percent or greater as a condition of graduation from such institution'. To satisfy this requirement at UMKC, students access the exam through the Canvas site. This requirement will be listed in the degree audit system as, 'Take State Mandated Missouri Higher Education Civics Achievement Examination', and listed on the transcript as 'Missouri Civics Examination'.

## Student Learning Outcomes

Students graduating from this program will:

- write logically correct and well-structured proofs in a variety of content areas.
- translate real-world problems into mathematical or statistical language.
- demonstrate qualitative skills in analyzing and evaluating mathematical or statistical problems.
- carry out numerical computations for solving problems.
- present mathematical or statistical content effectively and professionally.

## Program Requirements

### UMKC Essentials

Code	Title	Credits
First Semester Experience Course (GEFSE)		3
Written Communication:		
ENGLISH 110	Introduction to Academic Prose	3
ENGLISH 225	English II: Intermediate Academic Prose	3
Oral Communication (choose one of the following):		
COMM-ST 110	Fundamentals of Effective Speaking and Listening	3
COMM-ST 140	Introduction to Communication	3
COMM-ST 212	Argumentation And Debate (offered via dual credit only)	3
COMM-ST 277	Interpersonal Communication	3
Math Pathway (satisfied in major requirements below)		
Critical Thinking in Arts & Humanities (GECRT-AH)		3
Critical Thinking in Natural & Physical Sciences (GECRT-SC)		3
Critical Thinking in Social & Behavioral Sciences (GECRT-SS)		3
Culture & Diversity Course (GECDV)		3

Civic & Urban Engagement Course (GECUE)	3
Total Credits	27

## Constitution Course Requirement

Section 170.011.1 of the Missouri Revised Statutes, 2015, states that all candidates for a degree issued by a college or university in the state of Missouri must have “satisfactorily passed an examination on the provisions and principles of the Constitution of the United States and of the state of Missouri, and in American history and American institutions.”

Courses at UMKC that satisfy this state requirement are:

Code	Title	Credits
Choose one of the following:		
CJC 364	The Supreme Court And The Criminal Process	3
HISTORY 101	U.S. History to 1877	
HISTORY 102	U.S. History Since 1877	
HONORS 230	Honors American Government	
POL-SCI 210	American Government	
Total Credits		3

There are a few other ways this requirement can be satisfied for students transferring to UMKC:

- Take an equivalent course from the list above at a regionally accredited institution.
- Earn credit for one of the above courses through AP, IB, or CLEP.
- Take a course that directly satisfies the Missouri Constitution Requirement at another Missouri institution.
- Have a previous bachelors degree (or higher) from a regionally accredited institution.
- Have an Associate of Arts degree from a regionally accredited institution.
- Complete the 42 Hour Core at a Missouri institution and have it listed on the official transcript.

## Major Requirements

Students must successfully complete the major requirements below with at least 12 hours of the noted upper division (300+) course requirements completed at UMKC.

One Writing Intensive (WI) course must be completed during the junior or senior year and after completion of ENGLISH 225 (or equivalent). MATH 464WI is recommended.

Code	Title	Credits
MATH 120	Precalculus (satisfies Math Pathway)	5
MATH 210	Calculus I	4
MATH 220	Calculus II	4
MATH 250	Calculus III	4
MATH 300	Linear Algebra I	3
MATH 301	On Solid Ground: Sets and Proof (a grade of B- or better is required)	3
MATH 402	Advanced Analysis I	3
MATH 410	Abstract Algebra	3
or MATH 420	Linear Algebra II	
STAT 436	Introduction To Mathematical Statistics I	3
Select a minimum of 9 hours of coursework in mathematics or statistics at the 300 level or above: <sup>1</sup>		9
MATH 314	Graph Theory with Applications	
MATH 345 & 345L	Ordinary Differential Equations and Ordinary Differential Equations Lab	
MATH 401	Data-Driven Modeling	
MATH 406	Partial Differential Equations	
MATH 407	Introduction to Complex Variables	
MATH 412	Advanced Analysis II	
MATH 420	Linear Algebra II	
MATH 434	Scientific Computing	

MATH 464WI	History of Mathematics (recommended for WI requirement)
MATH 469	Mathematical Modeling
MATH 490	Special Topics
MATH 496	Internship/Practical Training in Mathematics or Statistics
STAT 340L	Introduction to Data Visualization
STAT 355L	Introduction to Diagnostic Analytics
STAT 360L	Introduction to Predictive Analytics
STAT 400	Machine Learning and Statistical Modeling
STAT 415	Statistical Design of Experiments
STAT 441	Introduction To Mathematical Statistics II
STAT 451	Applied Statistical Analysis
STAT 480	Statistical Models in Actuarial Science
STAT 482	Statistical Models for Life Contingencies
STAT 496	Internship/Practical Training in Mathematics or Statistics
<b>Total Credits</b>	
<b>41</b>	

<sup>1</sup> At least four of the courses at the 300 level or above must be completed in the Department of Mathematics and Statistics at UMKC.

## General Electives

Students must take elective credit hours to meet the minimum credit hour requirement for their degree, including at least 36 credit hours of coursework at the 300-level or above. The minimum required by the university is 120 credit hours, of which at least 30 credit hours must be taken at UMKC, but some degree programs require more.

Code	Title	Credits
<b>General Electives (Suggested Coursework Below)</b>		<b>49</b>
ACCTNG 210	Introduction To Financial Accounting	
COMP-SCI 101	Problem Solving and Programming I	
COMP-SCI 101L	Problem Solving & Programming I Lab	
COMP-SCI 191	Discrete Structures I	
COMP-SCI 291	Discrete Structures II	
COMP-SCI 394R	Applied Probability	
ECON 201	Principles of Macroeconomics	
ECON 202	Principles of Microeconomics	
ECON 425	Econometrics	
DSOM 211	Business Analytics I	
DSOM 311	Business Analytics II	
FIN 325	Financial Management	
FIN 345	Investments	
GEOG 444	Spatial Data Analysis	
MKT 390	Customer Data Analytics	

**Minimum GPA: 2.0 (degree and major)**

**Total Credit Hours: 120**

## Tools for Planning and Fulfilling Academic Requirements

UMKC's Major Maps are detailed, semester by semester plans that lead a student to complete all degree requirements within four years. Plans include benchmarks and critical courses by term that assist a student's evaluation of progress and major "fit". In order to ensure that the appropriate courses are taken, students are encouraged to consult with the undergraduate advisor for this major. Please see the tab above to view the major map for this program.

UMKC's Transfer Guides (<https://www.umkc.edu/admissions/transfer-guides.html>) provide detailed guidance on recommended transfer coursework, plans of study, transfer timelines, and transfer contact information. To ensure a seamless transfer experience, students are encouraged to work with both their community college advisor and a UMKC advisor when planning their coursework.

UMKC's PlanMyDegree 'Audit' (<https://www.umkc.edu/registrar/academic-programs/plan-my-degree.html>) degree audit system provides an individual evaluation of all degree requirements (General Education, Degree Specific, Major Specific, etc.) for students' officially recorded (Office of Registration and Records) and "what if" exploratory plans of study. This evaluation is used to certify all graduation requirements.

UMKC's PlanMyDegree 'Plans' (<https://www.umkc.edu/registrar/academic-programs/plan-my-degree.html>) degree planning tool enables students to develop a personalized semester by semester plan of study towards completion of degree requirements for student's officially recorded (Office of Registration and Records) and "what if" exploratory plans of study. Update and edit your full plan to degree completion each term and confirm accuracy each semester with your Academic Advisor(s).

## Major Map

### Four Year Graduation Plan - Courses & Critical Benchmarks for First Time College Students:

UMKC's Major Maps are detailed, undergraduate four-year course outlines that inform students on the classes they should take and when to take them. Outlines are updated yearly. Graduate students should visit their program's individual school for program outlines.

The following is a sample course of study. Your path to graduation may vary based on factors such as college credit you earned while in high school, transfer work from other institutions of higher learning, and placement in Mathematics. You are responsible for checking prerequisites to any courses. It is the Student's responsibility to ensure that all program requirements are met. This guide is not a substitute for academic advisement.

#### First Year

Fall Semester	Credits	Spring Semester	Credits
MATH 120 <sup>CC</sup>		5 MATH 210 <sup>CC</sup>	4
GEFSE 101		3 ENGLISH 225	3
ENGLISH 110		3 GECRT-AH 101	3
GECRT-SC 101		3 HISTORY 101, 102, or POL-SCI 210	3
		Foreign Language Requirement (110 or higher)	3
		14	16

#### Second Year

Fall Semester	Credits	Spring Semester	Credits
MATH 220 <sup>CC</sup>		4 MATH 250 <sup>CC</sup>	4
COMM-ST 110, 277, or 140		3 MATH 301	3
GECRT-SS 101		3 GECUE 201	3
GECDV 201		3 General Elective (STAT 235 recommended)	3
Foreign Language course (120 or higher)		3 Foreign Language course (211)	3
		16	16

#### Third Year

Fall Semester	Credits	Spring Semester	Credits
MATH 300		3 MATH 410 or STAT 441 (or any MATH or STAT 3XX/4XX Major Elective)	3
STAT 436		3 General Elective (ECON 202 for Actuarial Science minor)	3
General Elective (ECON 201 for Actuarial Science minor)		3 General Elective (STAT 441 for Actuarial Science minor)	3
Lab Science <sup>LO</sup>		1 General Elective (ACCTG 210 for Actuarial Science minor)	3
General Elective		3 General Elective	3
General Elective		3	
		16	15

**Fourth Year**

<b>Fall Semester</b>	<b>Credits</b>	<b>Spring Semester</b>	<b>Credits</b>
MATH 420 (or MATH or STAT 3XX/4XX Major Elective, if took MATH 410)		3 MATH 469 or STAT 496 (or any MATH or STAT 3XX/4XX Major Elective )	3
MATH 402		3 3XX/4XX WI Writing Intensive course (MATH 464WI recommended)	3
MATH 406 or 407 (or any MATH or STAT 3XX/4XX Major Elective )		3 3XX/4XX General Elective (FIN 345 for Actuarial Science minor)	3
3XX/4XX General Elective (STAT 480 for Actuarial Science minor)		3 General Elective	3
3XX/4XX General Elective (FIN 325 for Actuarial Science minor)		3	
		15	12

Total Credits: 120

CC Critical Courses provide feedback regarding major fit and help indicate likelihood of successful completion of chosen academic program and degree.

LO Lab Science course may be paired with associated Lecture course fulfilling General Elective hours

## Recommendations to Maintain Progress toward 4-Year Degree Completion

- Completion of the First Semester Experience (FSE) course in first term.
- Early completion of Written Communication, Oral Communication, and Math Pathway requirements.
- Maintain the minimum GPA required for academic Good Standing for your degree program.
- Completion at least 15 credit hours toward degree each regular semester. *(Students may use the summer to ensure completion of 30 hours per academic year or to lighten Fall and Spring course loads.)*
- Enrollment in Critical Courses as listed on the Major Map is recommended in order to maintain timely progress and completion of prerequisite coursework.
- Early and continuous enrollment in Foreign Language through completion of level required for degree program is recommended. *(The Foreign Language placement exam is highly recommended to ensure placement in the correct course level.)*
- Regular consultation with Academic Advisor(s) for program(s) of study is strongly recommended and may be required for some degree programs..

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