MATHEMATICS, BACHELOR OF ARTS (528)

Program Coordinator

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This major is for students that intend to pursue a graduate degree in mathematics, and/or intend to pursue employment in business and industry. This major does not lead to teacher certification.

Concentrations

- Fundamental Analysis & Discrete (MAAD)
- Fundamentals of Applied Mathematics (MAAM)
- Fundamentals of Math Studies (MAMS)

Program Requirements (51 hours)

A baccalaureate degree requires a minimum of 120 unduplicated semester hours. More information can be found at www.wku.edu/registrar/degree_certification.php. (https://www.wku.edu/registrar/degree_certification.php)

Students who began WKU in the Fall 2014 and thereafter should review the Colonnade requirements located at: https://www.wku.edu/colonnade/colonnaderequirements.php. (https://www.wku.edu/colonnade/colonnaderequirements.php)

A major in mathematics provides a Bachelor of Arts degree and requires either a minimum of 36-39 semester hours for a general major with a minor or second major or a minimum of 51 semester hours for an extended major. Note: All mathematics courses listed as prerequisites for other mathematics courses must have been completed with a grade of "C" or better.

Students in the extended major (528) are required to satisfy a computational requirement by completing two courses chosen from CS 180, CS 290 , STAT 330, MATH 371, PHYS 316, or PHYS 318. [If MATH 371 is selected to fulfill this requirement, it cannot also be used as an elective in the extended major (528).]

To prepare for graduate study in mathematics, the student must complete a minimum of 51 hours of mathematics with the following requirements:

Core Courses

Code	Title	Hours
MATH 136	Calculus I	4
MATH 137	Calculus II	4
MATH 237	Multivariable Calculus	4
MATH 307	Introduction to Linear Algebra	3
MATH 310	Introduction to Discrete Mathematics	3
MATH 317	Introduction to Algebraic Systems	3
MATH 337	Elements of Real Analysis	3
MATH 431	Intermediate Analysis I	3
MATH 498	Senior Seminar	1-3
Total Hours		**28-30**

Select one of the following concentrations:

B1: Fundamentals of Analysis and Discrete Mathematics

Code	Title	Hours
MATH 417	Algebraic Systems	3
MATH 439	Topology I	3
MATH 450	Complex Variables	3
Select two of the following:		6
MATH 323	Geometry I	
MATH 415	Algebra and Number Theory	
MATH 473	Introduction to Graph Theory	
Select six elective hours from the following:		6
MATH 275	Introductory Topics in Mathematics (up to 3 hours)	
STAT 301	Introductory Probability and Applied Statistics	
MATH 305	Introduction to Mathematical Modeling	
MATH 323	Geometry I	
MATH 331	Differential Equations	
MATH 370	Applied Techniques in Mathematics	
MATH 382	Probability and Statistics I	
MATH 398	Seminar (up to 3 hours)	
MATH 405	Numerical Analysis I	
MATH 406	Numerical Analysis II	
MATH 409	History of Mathematics	
MATH 415	Algebra and Number Theory	
MATH 435	Partial Differential Equations	
MATH 470	Introduction to Operations Research	
MATH 473	Introduction to Graph Theory	
MATH 475	Selected Topics in Mathematics (up to 6 hours)	
MATH 482	Probability and Statistics II	
Total Hours		**21**

B2: Fundamentals of Applied Mathematics

Code	Title	Hours
MATH 331	Differential Equations [1]	3
MATH 370	Applied Techniques in Mathematics [1]	3
MATH 382	Probability and Statistics I [1]	3
MATH 405	Numerical Analysis I [1]	3
Select two of the following: [1]		6
MATH 305	Introduction to Mathematical Modeling	
MATH 406	Numerical Analysis II	
MATH 435	Partial Differential Equations	
MATH 470	Introduction to Operations Research	
MATH 482	Probability and Statistics II	
Select three credit hours of the following:		3
MATH 275	Introductory Topics in Mathematics	
STAT 301	Introductory Probability and Applied Statistics	

MATH 305	Introduction to Mathematical Modeling
MATH 323	Geometry I
MATH 398	Seminar
MATH 406	Numerical Analysis II
MATH 409	History of Mathematics
MATH 415	Algebra and Number Theory
MATH 417	Algebraic Systems
MATH 435	Partial Differential Equations
MATH 439	Topology I
MATH 450	Complex Variables
MATH 470	Introduction to Operations Research
MATH 473	Introduction to Graph Theory
MATH 475	Selected Topics in Mathematics
MATH 482	Probability and Statistics II
Total Hours	**21**

B3: Fundamentals of Mathematical Studies

Code	Title	Hours
MATH 450	Complex Variables	3
Select two of the following:		6
MATH 405	Numerical Analysis I	
MATH 406	Numerical Analysis II	
MATH 409	History of Mathematics	
MATH 415	Algebra and Number Theory	
MATH 417	Algebraic Systems	
MATH 435	Partial Differential Equations	
MATH 439	Topology I	
MATH 470	Introduction to Operations Research	
MATH 473	Introduction to Graph Theory	
MATH 482	Probability and Statistics II	
Select twelve elective hours of the following:		12
MATH 275	Introductory Topics in Mathematics (up to 3 hours)	
STAT 301	Introductory Probability and Applied Statistics	
MATH 305	Introduction to Mathematical Modeling	
MATH 323	Geometry I	
MATH 331	Differential Equations	
MATH 370	Applied Techniques in Mathematics	
MATH 382	Probability and Statistics I	
MATH 398	Seminar (up to 3 hours)	
MATH 405	Numerical Analysis I	
MATH 406	Numerical Analysis II	
MATH 409	History of Mathematics	
MATH 415	Algebra and Number Theory	
MATH 435	Partial Differential Equations	
MATH 470	Introduction to Operations Research	
MATH 473	Introduction to Graph Theory	

MATH 475	Selected Topics in Mathematics (up to 6 hours)
MATH 482	Probability and Statistics II
Total Hours	**21**

[1] Students may take certain 500-level mathematics courses for undergraduate credit in place of courses listed in items B1i, B1ii, B2i, B2ii, B3i, or B3ii with the approval of the mathematics department chair. No minor or second major for the extended major is required.

The Department of Mathematics offers a Joint Undergraduate Master's Program (JUMP) which provides academically outstanding students the opportunity to complete both an undergraduate Bachelor of Arts degree and a graduate Master of Science degree in an accelerated timeframe. The MS in Mathematics prepares students to be competitive applicants for admission into a Ph.D. program and/or for positions where strong research skills are needed. Contact the graduate program coordinator for additional information, see https://catalog.wku.edu/graduate/science-engineering/mathematics/mathematics-ms/

This JUMP program allows students to start working toward their MS in Mathematics with a concentration in General Mathematics, Computational Mathematics, or Mathematical Economics (Ref: 085) while completing their Bachelor of Arts degree in Mathematics (Ref: 528 and 728) or a Bachelor of Science degree in Mathematical Economics (Ref: 731). Undergraduate students admitted into JUMP may take graduate courses that count toward both undergraduate and graduate degrees. Up to 12 credit hours can be double-counted toward both degrees, and up to 15 hours of graduate courses can be taken while a student is completing the undergraduate degree. The key benefit of the JUMP program is that it allows students to earn a bachelor's and a master's degree in an accelerated timeframe. For more information, see https://www.wku.edu/math/.

To be considered for admission to the JUMP program to earn a BA in Mathematics (or a BS in Mathematical Economics) and a MS in Mathematics in an accelerated timeframe, a student must meet the following requirements:

Be a Mathematics or a Mathematical Economics major (includes programs with reference numbers 528, 728, and 731);

Have completed at least 60 hours total, with at least 24 hours earned at WKU;

Have at least 15 or more credit hours remaining to complete the bachelor's degree;

Have completed or be enrolled in 15 credit hours in Mathematics;

Have a minimum cumulative undergraduate GPA of 3.25;

Have one of the following:

a. 3.25 GPA in the Mathematics or Mathematical Economics major AND a grade of B or higher in at least one of the courses: MATH 307, MATH 310, MATH 317, MATH 337, MATH 439;

b. 3.0 GPA in the Mathematics or Mathematical Economics major AND a grade of B or higher in at least two of the courses: MATH 307, MATH 310, MATH 317, MATH 337, MATH 439.

All applicants to Mathematics JUMP must submit to a Graduate Coordinator the following documents for consideration: two letters

of recommendation from a WKU Mathematics faculty members and a statement of purpose outlining academic goals and motivation for pursuing the JUMP program.

Finish in Four Plans
Fundamentals of Analysis & Discrete Mathematics Concentration

First Year

Fall	Hours	Spring	Hours
MATH 136	4	MATH 137	4
CS 180	4	CS 290 or STAT 330	3-4
ENG 100	3	COMM 145	3
Colonnade - Natural & Physical Sciences w/ lab	3-5	HIST 101 or HIST 102	3
		Colonnade - Social & Behavioral Science	3
	14-16		**16-17**

Second Year

Fall	Hours	Spring	Hours
MATH 307	3	MATH 237	4
MATH 310	3	Math upper-division Elective	3
ENG 200	3	Colonnade - Natural & Physical Sciences w/ no lab	3
Colonnade - Arts & Humanities	3	Colonnade - Writing in the Disciplines	3
World Language Requirement or General Elective	3	General Elective	3
	15		**16**

Third Year

Fall	Hours	Spring	Hours
MATH 317	3	MATH 337	3
Math upper-division Elective	3	MATH 417	3
Colonnade - Social & Cultural	3	Colonnade - Local to Global	3
Colonnade - Systems	3	General Elective	3
General Elective	3	General Elective	3
	15		**15**

Fourth Year

Fall	Hours	Spring	Hours
MATH 431	3	MATH 450	3
MATH 439	3	MATH 498	3
Math upper-division Elective	3	Math upper-division Elective	3
General Elective	3	General Elective	3
General Elective	2	General Elective	3
	14		**15**

Total Hours 120-123

Fundamentals of Applied Math Concentration

First Year

Fall	Hours	Spring	Hours
MATH 136	4	MATH 137	4
CS 180	4	CS 290 or STAT 330	3-4
ENG 100	3	COMM 145	3
Colonnade - Natural & Physical Sciences w/ lab	3-5	HIST 101 or HIST 102	3
		Colonnade - Social & Behavioral Science	3
	14-16		**16-17**

Second Year

Fall	Hours	Spring	Hours
MATH 307	3	MATH 237	4
MATH 310	3	MATH 331	3
ENG 200	3	Math upper-division Elective	3
Colonnade - Arts & Humanities	3	Colonnade - Natural & Physical Sciences w/ no lab	3
World Language Requirement or General Elective	3	Colonnade - Writing in the Disciplines	3
	15		**16**

Third Year

Fall	Hours	Spring	Hours
MATH 317	3	MATH 337	3
MATH 382	3	MATH 370	3
MATH 405	3	Colonnade - Local to Global	3
Colonnade - Social & Cultural	3	Colonnade - Systems	3
General Elective	3	General Elective	3
	15		**15**

Fourth Year

Fall	Hours	Spring	Hours
MATH 431	3	MATH 498	3
Math upper-division Elective	3	Math upper-division Elective	3
General Elective	3	General Elective	3
General Elective	3	General Elective	3
General Elective	2	General Elective	3
	14		**15**

Total Hours 120-123

Fundamentals of Math Studies Concentration

First Year

Fall	Hours	Spring	Hours
MATH 136	4	MATH 137	4
CS 180	4	CS 290 or STAT 330	3-4
ENG 100	3	COMM 145	3
Colonnade - Natural & Physical Sciences w/ lab	3-5	HIST 101 or HIST 102	3
		Colonnade - Social & Behavioral Science	3
	14-16		**16-17**

Second Year

Fall	Hours	Spring	Hours
MATH 307	3	MATH 237	4
MATH 310	3	Math upper-division Elective	3
ENG 200	3	Math upper-division Elective	3
Colonnade - Arts & Humanities	3	Colonnade - Natural & Physical Sciences w/ no lab	3
World Language Requirement or General Elective	3	Colonnade - Writing in the Disciplines	3
	15		**16**

Third Year

Fall	Hours	Spring	Hours
MATH 317	3	MATH 337	3
Math upper-division Elective	3	MATH 450	3
Colonnade - Local to Global	3	Math upper-division Elective	3
Colonnade - Social & Cultural	3	Colonnade - Systems	3
General Elective	3	General Elective	3
	15		**15**

Fourth Year

Fall	Hours	Spring	Hours
MATH 431	3	MATH 498	3
Math upper-division Elective	3	Math upper-division Elective	3
General Elective	3	General Elective	3
General Elective	3	General Elective	3
General Elective	2	General Elective	3
	14		**15**

Total Hours 120-123