MATHEMATICS, BS

Program Description

Mathematics:

People with mathematics degrees are found in a broad range of occupations where quantitative skills are needed; one of the largest employers of mathematics is the National Security Agency. Often a minor field of study (such as computer science) provides the supporting credential for entry-level jobs.

Actuarial and Business Applications:

The actuarial and business applications concentration combines mathematical knowledge with quantitative business applications. The result is a very marketable degree that provides many exciting career opportunities for graduates. A student should be prepared to take the first actuarial examination in the spring of his/her junior year and the second examination the following spring. A student choosing this emphasis will complete a minor in accounting-finance.

Teaching Certification:

Many who major in the field of mathematics combine those studies with education courses and obtain employment as teachers. A completion of professional education coursework, including a semester of student teaching, prepares students for elementary or secondary teacher certification in Michigan and Ontario.

Graduate School:

An undergraduate mathematics major with emphasis on abstraction, together with an analytical approach to problem solving, continues to provide strong preparation for graduate work in diverse fields — especially when combined with a minor in the related field.

Program Learning Outcomes (BS Mathematics)

- Develop and clearly express mathematical concepts in written and oral communication. *(Communication)*
- Use computing, gather evidence, discover patterns, create models, experiment with data, and solve theoretical or applied problems. *(Problem Solving)*
- Use symbolic, analytical and quantitative skills and formal mathematical tools and techniques to analyze problems, synthesize solutions, and write proofs. *(Analysis)*
- Apply mathematical methodologies and adhere to ethical and professional standards in their senior capstone project. *(Professional Responsibility)*

Program Learning Outcomes (BS Mathematics, Elementary Teaching)

- Use mathematical processes, axiomatic systems, computing, algorithms, and logical reasoning to solve problems and communicate mathematical ideas. *(Mathematical Processes and Number Concepts)*
- Describe, analyze and generalize patterns, algebraic relationships and functions using the tools of algebra and calculus. *(Patterns, Algebraic Relationships and Functions)*
- Apply geometric principles in Euclidean, analytic, transformational and vector geometry to analyze geometric objects, form conjectures, solve problems and prove theorems. *(Measurement and Geometry)*
- Organize, analyze and interpret data, sets and relations using the tools of statistics, probability and discrete mathematics. *(Data Analysis, Statistics, Probability, and Discrete Mathematics)*
- Make instructional choices that reflect the integrated nature of mathematical concepts and mathematical practices within and among the mathematical domains. *(Instructional Choices)*

Program Learning Outcomes (BS Mathematics, Secondary Teaching)

- Use mathematical processes, axiomatic systems, computing, algorithms, and logical reasoning to solve problems and communicate mathematical ideas. *(Mathematical Processes and Number Concepts)*
- Describe, analyze, and generalize patterns, algebraic relationships and functions using the tools of algebra and calculus. *(Patterns, Algebraic Relationships, and Functions)*
- Apply geometric principles in Euclidean, analytic, transformational and vector geometry to analyze geometric objects, form conjectures, solve problems and prove theorems. *(Measurement and Geometry)*
- Organize, analyze and interpret data, sets and relations using the tools of statistics, probability and discrete mathematics. *(Data Analysis, Statistics, Probability, and Discrete Mathematics)*

Bachelor of Science Mathematics

Code	Title	Hours
Departmental Requirements		
MATH 151	Calculus I	4
MATH 152	Calculus II	4
MATH 215	Fund Concepts of Mathematics	4
MATH 251	Calculus III	4
MATH 305	Linear Algebra	3
MATH 308	Probability and Math Stats	3
MATH 309	Applied Statistics	4
MATH 310	Differential Equations	3
MATH 341	Abstract Algebra I	3
MATH 351	Graph Theory	3
MATH 401	Mathematical Modeling	3
MATH 411	Advanced Topics in Calculus	3
MATH 421	Real Analysis	3
MATH 490	Ind Res Topics in Mathematics	3
Additional MATH course [1]		3-4
Other Requirements		
CSCI 103	Survey of Computer Science	3
CSCI 105	Intro to Computer Programming	3
CSCI 121	Principles of Programming	4
PHYS 231	Appl Phys Engineer/Scientist I	4
Free Electives or Academic Minor		32-36
Total Hours		**96-101**

[1] Course numbered above MATH 215 Fund Concepts of Mathematics

General Education: All LSSU bachelor's degree candidates must complete the LSSU General Education Requirements.

A minimum of 124 credits (at the 100 level or higher) must be earned for graduation with a cumulative gpa of 2.00 or higher. A gpa of 2.00 or higher is also required in your Major, as well as in your General Education Requirements.

Bachelor of Science Mathematics, Elementary Teaching

In this program, students will complete a teaching major in mathematics and a planned program in the other three academic areas essential to elementary school teaching: language arts, natural science and social science. The planned program is explained in the Elementary Education section of this catalog.

The program also includes general education requirements and a professional education sequence. Students complete their initial teacher education courses in their sophomore year, and then apply for formal admission to the Teacher Education Program.

Code	Title	Hours
Mathematics Requirements		
CSCI 105	Intro to Computer Programming	3
CSCI 106	Web Page Design & Development	3
MATH 103	Number Sys/Prob Solv Elem Teac	4
MATH 104	Geometry/Measurement Elem Teac	4
MATH 151	Calculus I	4
MATH 152	Calculus II	4
MATH 207	Prin of Statistical Methods	3
MATH 215	Fund Concepts of Mathematics	4
MATH 305	Linear Algebra	3
MATH 321	History of Mathematics	3
MATH 325	College Geometry	3
Total Hours		**38**

For information regarding the Professional Education Sequence and Elementary Planned Program, see Elementary Education.

General Education: All LSSU bachelor's degree candidates must complete the LSSU General Education Requirements.

A minimum of 124 credits (at the 100 level or higher) must be earned for graduation with a cumulative gpa of 2.70 or higher. A gpa of 2.70 or higher is required in your Major, and a gpa of 2.00 or higher is required in your General Education Requirements.

Bachelor of Science Mathematics, Concentrations in Secondary Teaching Grade Band 5-9, and Secondary Teaching Grade Band 7-12

The BS Mathematics Secondary Teaching Grade Band 5-9/Grade Band 7-12 focuses on developing teacher candidates in mathematical knowledge for teaching specifically in the grade band selected. Teacher candidates will take mathematics courses that will provide them with both common and specialized content knowledge of mathematics that relates to the standards addressed in the selected grade band. In addition to mathematics courses, students will also take a series of courses that are part of a STEM and Modeling Cognate in order to make connections and demonstrate applications of mathematics to other subjects.

Teacher candidates will also take both education and mathematics education courses to develop and strengthen their knowledge of pedagogical content and curriculum. In these courses, the teacher candidates will develop lesson and unit plans, discuss methods of mathematics intervention, and engaging student motivation in mathematics. Additionally, students will engage in clinical experiences throughout the program as they develop, deliver, and reflect on learning and instructional activities with students in the selected grade band.

Upon completion of coursework, student teaching, a semester-long experience, is completed in the fall of the fifth year within the selected grade band. Typically, this student teaching experience will be in the Eastern Upper Peninsula or in Sault Ste. Marie, Ontario. The 5-9/7-12 Math Michigan Test for Teacher Certification must be passed prior to beginning student teaching.

Code	Title	Hours
Secondary Mathematics Requirements		
MEDU 303	Teach Sec Mathematics Tech	3
MEDU 403	Sec Mathematics Instruction	3
MATH 151	Calculus I	4
MATH 152	Calculus II	4
MATH 215	Fund Concepts of Mathematics	4
MATH 321	History of Mathematics	3
MATH 325	College Geometry	3
CSCI Cognate		
CSCI 105	Intro to Computer Programming	3
CSCI 121	Principles of Programming	4
STEM and Modeling Cognate		**12-18/6-10**
Grade Band 5-9: Choose two from the following options (12-18 credits):		
Grade Band 7-12: Choose one from the following options (6-10 credits):		
Option 1		
BIOL 131	General Biology: Cells	
BIOL 132	General Biology: Organisms	
Option 2		
CHEM 115	General Chemistry I	
CHEM 116	General Chemistry II	
Option 3		
CSCI 115	Introduction to Data Science	
CSCI 265	Int to Artificial Intelligence	
Option 4		
ECON 201	Principles Macroeconomics	
ECON 202	Principles Microeconomics	
Option 5		
EVRN 131	Introduction to GIS and GPS	
EVRN 225	Intermediate GIS	
Option 6		
POLI 110	Intro American Govt/Politics	
POLI 234	Women & Politics Around World	
Grade Band 5-9 Physics Requirement:		

PHYS 221	Principles of Physics I	4
or PHYS 231	Appl Phys Engineer/Scientist I	
Grade Band 7-12 Physics Requirement:		
PHYS 231	Appl Phys Engineer/Scientist I	4
Total Hours		**51-49**

Code	Title	Hours
Additional Grade Band Math Requirements		**3-25**
Grade Band 5-9 Requirement (3 Credits):		
MATH 207	Prin of Statistical Methods	
Grade Band 7-12 Requirement (25 Credits)		
MATH 251	Calculus III	
MATH 305	Linear Algebra	
MATH 308	Probability and Math Stats	
MATH 309	Applied Statistics	
MATH 310	Differential Equations	
MATH 341	Abstract Algebra I	
MATH 401	Mathematical Modeling	
MATH 421	Real Analysis	
Total Hours		**3-25**

Code	Title	Hours
Professional Education Sequence (Grade Band 5-9)		
Minimum grade of B- in all TEAC Courses		
TEAC 101	Becoming a Teacher	2
TEAC 120	Impact Diversity on Education	4
TEAC 221	Special Education/Partnerships	3
TEAC 222	Adolescent Development	3
TEAC 343	3-6 Operations	3
TEAC 355	Gen Method Adolescent Learners	4
TEAC 423	Partnerships & Classroom Mgmt	3
TEAC 444	3-6 Fraction Decimal Operation	3
TEAC 453	3-6 Math/Sci Integrated Method	4
TEAC 480	Directed Teaching Seminar	2
TEAC 492	Directed Teaching	10
Total Hours		**41**

Code	Title	Hours
Professional Education Sequence (Grade Band 7-12)		
Minimum grade of B- in all TEAC Courses		
TEAC 101	Becoming a Teacher	2
TEAC 120	Impact Diversity on Education	4
TEAC 221	Special Education/Partnerships	3
TEAC 222	Adolescent Development	3
TEAC 423	Partnerships & Classroom Mgmt	3
TEAC 355	Gen Method Adolescent Learners	4
TEAC 480	Directed Teaching Seminar	2
TEAC 492	Directed Teaching	10
Total Hours		**31**

General Education: All LSSU bachelor's degree candidates must complete the LSSU General Education Requirements.

A minimum of 124 credits (at the 100 level or higher) must be earned for graduation with a cumulative gpa of 2.70 or higher. A gpa of 2.70 or higher is required in your Major, and a gpa of 2.00 or higher is required in your General Education Requirements.

Bachelor of Science Mathematics, Concentration Actuarial and Business Applications

Code	Title	Hours
Departmental Requirements		
MATH 151	Calculus I	4
MATH 152	Calculus II	4
MATH 215	Fund Concepts of Mathematics	4
MATH 251	Calculus III	4
MATH 305	Linear Algebra	3
MATH 308	Probability and Math Stats	3
MATH 309	Applied Statistics	4
MATH 310	Differential Equations	3
MATH 341	Abstract Algebra I	3
MATH 351	Graph Theory	3
MATH 401	Mathematical Modeling	3
MATH 411	Advanced Topics in Calculus	3
MATH 421	Real Analysis	3
MATH 490	Ind Res Topics in Mathematics	3
Cognates		
CSCI 103	Survey of Computer Science	3
CSCI 105	Intro to Computer Programming	3
CSCI 121	Principles of Programming	4
ECON 201	Principles Macroeconomics	3
FINC 341	Managerial Finance	4
Free Electives		11-15
Total Hours		**75-79**

A student choosing this emphasis will complete a minor in accounting finance (24 credits).

General Education: All LSSU bachelor's degree candidates must complete the LSSU General Education Requirements.

A minimum of 124 credits (at the 100 level or higher) must be earned for graduation with a cumulative gpa of 2.00 or higher. A gpa of 2.00 or higher is also required in your Major, as well as in your General Education Requirements.