

## Aligning Mathematics Program Goals with Courses/Course Goals

<b>Program Goal</b>	
<p><b>Goal 1:</b> Provide a foundation for critical thinking by developing skills in logic and problem solving in order to build student competencies essential to a liberal arts education.</p>	
<b>Course Level Goals</b>	<b>Courses meeting Program Goal 1</b>
<p>Foundational course goals:</p> <ul style="list-style-type: none"> <li>• Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.</li> <li>• Represent mathematical information symbolically, visually, numerically, and verbally.</li> <li>• Use arithmetical, algebraic, and statistical methods to solve problems.</li> <li>• Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.</li> <li>• Recognize that mathematical and statistical methods have limits.</li> </ul>	<p>MATH 102, 108, 109</p>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Prepare and motivate students with the skills necessary for success in calculus</li> <li>• Develop and hone skills for graphing and solving problems involving a variety of functions including polynomials, trigonometric functions, exponentials, and logarithms</li> <li>• Create a solid foundation for trigonometric functions, with an emphasis on the unit circle</li> </ul>	<p>MATH 123 Pre-Calculus</p>
<p>Course goals:</p> <ul style="list-style-type: none"> <li>• Teach students to think and analyze critically, armed with statistical savvy, to validate and/or question data uncovered through various means in daily life.</li> <li>• Show students a purpose and relevance present in statistical analysis, particularly in the field of social sciences.</li> <li>• Introduce students to the scope and usefulness of an understanding of statistics with practical and relevant real life examples and data, both given to and collected by the students.</li> </ul>	<p>MATH 110 Introduction to Statistics</p>

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<b>Program Goal</b>	
<p><b>Goal 2:</b> Develop the ideas of thinking independently, critically, and creatively while providing a solid mathematical foundation for students intending to major in math or continue on to an advanced degree in mathematics.</p>	
<b>Course Level Goals</b>	<b>Courses meeting Program Goal 2</b>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Enhance students' knowledge of a variety of functions (trigonometric, exponential, logarithmic, polynomial, and rational)</li> <li>• Introduce and apply fundamental ideas of calculus (limits, continuity, differentiation, integration).</li> </ul>	<p>MATH 125 Calculus &amp; Analytic Geometry I</p>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Provide students intending to major in mathematics, natural sciences, and engineering with a second course in calculus</li> <li>• Extend the concept of integrals to a variety of applications, establishing several integration techniques</li> <li>• Provide an introduction to sequences and series.</li> </ul>	<p>MATH 225 Calculus &amp; Analytic Geometry II</p>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Develop methods and problem solving skills in solving systems of linear equations</li> <li>• Learn theory of matrices, determinants, vector spaces, linear transformations, eigenvalues and eigenvectors</li> <li>• Apply the knowledge and skills in natural and social sciences</li> </ul>	<p>MATH 301 Linear Algebra</p>
<p>Course Goals</p> <ul style="list-style-type: none"> <li>• Develop problem solving skills in probability, random variables, probability distributions, and sampling distributions</li> <li>• Gain a solid foundation in the theory of probability, which provides the foundation for modern statistical inference,</li> <li>• Learn to read and understand mathematical/statistical results and proofs as well as formulate his/her own proof to various problems</li> </ul>	<p>MATH 315 Mathematical Probability and Statistics</p>

<ul style="list-style-type: none"> <li>• Apply knowledge and skills in probability and statistics related sciences</li> </ul>	
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Understand how to mathematically describe physical and abstract quantities that have both magnitude and direction</li> <li>• Gain experience with the properties of functions whose domain consists of real numbers and whose range consists of vectors (vector-valued functions), including differentiation and integration</li> <li>• Extend earlier techniques of integration and differentiation of scalar functions to the field of vector-valued functions</li> <li>• Broaden students' understanding of the concepts of extrema for functions of more than one variable</li> </ul>	<p>MATH 325 Multi-Variable Calculus</p>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Classify ordinary differential equations</li> <li>• Introduce calculus-based techniques to solving ordinary differential equations and related application problems.</li> </ul>	<p>MATH 327 Differential Equations</p>
<p>Course Goals</p> <ul style="list-style-type: none"> <li>• Gain the necessary foundation for more advanced mathematics courses</li> <li>• Learn to study almost any mathematical subject on your own</li> <li>• Explore the ways in which creativity, intuition, and experience enhance their mathematical abilities</li> </ul>	<p>MATH 331 Introduction to Abstract Mathematics</p>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Demonstrate how social, cultural, and historical factors influenced the development of mathematics</li> <li>• Help students to understand how mathematical ideas have developed over time</li> <li>• Improve students' ability to explain mathematics in written and oral forms.</li> </ul>	<p>MATH 371 History of Mathematics</p>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Develop capabilities with an axiomatic treatment of mathematics</li> <li>• Develop an understanding of the structure of sets with operations on them</li> <li>• Acquire knowledge of the language and basic properties of these algebraic structures</li> <li>• Read and understand mathematical results and proofs as well as formulate his/her own proof to various problems</li> </ul>	<p>MATH 403 Abstract Algebra I</p>

<ul style="list-style-type: none"> <li>• Enhance communication of mathematical findings in writing and through oral communication</li> </ul>	
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Develop an in-depth mathematical understanding of the theory of calculus</li> <li>• Read mathematical results and proofs as well as formulate her own proofs to various problems.</li> <li>• Use and explain the importance of <ul style="list-style-type: none"> <li>▪ the axioms of real numbers</li> <li>▪ the definition of convergent and divergent sequences</li> <li>▪ the definition of the limit of a function at a point</li> <li>▪ the definition of continuity</li> <li>▪ the definition of the derivative</li> <li>▪ the definition of the Riemann integral</li> </ul> </li> </ul>	<p>MATH 431 Real Analysis I</p>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• To provide education majors with a strong geometrical background which will enable them to have a deep understanding of the math they will eventually teach</li> <li>• To provide math majors with a rigorous course which will enhance their proof-writing skills and allow them to fully develop their understanding of geometry</li> <li>• To help the students learn to study almost any mathematical subject on their own</li> <li>• To allow students to explore the ways in which creativity, intuition, and experience enhance their mathematical abilities</li> </ul>	<p>MATH 435: Geometry</p>

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<b>Program Goal</b>	
<p><b>Goal 3:</b> Teach students to think and analyze critically, armed with statistical savvy, to validate and/or question data uncovered through various means in daily life.</p>	
<b>Course Level Goals</b>	<b>Courses meeting Program Goal 3</b>
<p>Course goals:</p> <ul style="list-style-type: none"> <li>• Teach students to think and analyze critically, armed with statistical savvy, to validate and/or question data uncovered through various means in daily life.</li> <li>• Show students a purpose and relevance present in statistical analysis, particularly in the field of social sciences.</li> <li>• Introduce students to the scope and usefulness of an understanding of statistics with practical and relevant real life examples and data, both given to and collected by the students.</li> </ul>	<p>MATH 110 Introduction to Statistics</p>
<p>Course Goals:</p> <ul style="list-style-type: none"> <li>• Expand students' abilities to validate and/or question data</li> <li>• Use a variety of statistical inference methods to analyze data and draw meaningful conclusions.</li> <li>• Introduce statistical software often used in the field of social sciences.</li> </ul>	<p>MATH 210 Statistical Inference</p>

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<b>Program Goal</b>	
<b>Goal 4:</b> Give students the mathematical knowledge necessary to pursue a degree in education through coursework specifically geared towards education requirements/credentials.	
<b>Course Level Goals</b>	<b>Courses meeting Program Goal 4</b>
Foundational course goals: <ul style="list-style-type: none"> <li>• Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.</li> <li>• Represent mathematical information symbolically, visually, numerically, and verbally.</li> <li>• Use arithmetical, algebraic, and statistical methods to solve problems.</li> <li>• Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.</li> <li>• Recognize that mathematical and statistical methods have limits.</li> </ul>	MATH 108 Finite Mathematics
Course goals: <ul style="list-style-type: none"> <li>• Teach students to think and analyze critically, armed with statistical savvy, to validate and/or question data uncovered through various means in daily life.</li> <li>• Show students a purpose and relevance present in statistical analysis, particularly in the field of social sciences.</li> <li>• Introduce students to the scope and usefulness of an understanding of statistics with practical and relevant real life examples and data, both given to and collected by the students.</li> </ul>	MATH 110 Introduction to Statistics
Course Goals: <ul style="list-style-type: none"> <li>• Demonstrate how social, cultural, and historical factors influenced the development of mathematics</li> <li>• Help students to understand how mathematical ideas have developed over time</li> <li>• Improve students' ability to explain mathematics in written and oral forms.</li> </ul>	MATH 371 History of Mathematics

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<b>Program Goal</b>	
<b>Goal 5:</b> Prepare students for careers in business, government, social sciences and industry specifically through applications relevant to these courses of study.	
<b>Course Level Goals</b>	<b>Courses meeting Program Goal 5</b>
Foundational course goals: <ul style="list-style-type: none"> <li>• Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.</li> <li>• Represent mathematical information symbolically, visually, numerically, and verbally.</li> <li>• Use arithmetical, algebraic, and statistical methods to solve problems.</li> <li>• Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.</li> <li>• Recognize that mathematical and statistical methods have limits.</li> </ul>	MATH 109
Course goals: <ul style="list-style-type: none"> <li>• Teach students to think and analyze critically, armed with statistical savvy, to validate and/or question data uncovered through various means in daily life.</li> <li>• Show students a purpose and relevance present in statistical analysis, particularly in the field of social sciences.</li> <li>• Introduce students to the scope and usefulness of an understanding of statistics with practical and relevant real life examples and data, both given to and collected by the students.</li> </ul>	MATH 110 Introduction to Statistics
Course Goals: <ul style="list-style-type: none"> <li>• Expand students' abilities to validate and/or question data</li> <li>• Use a variety of statistical inference methods to analyze data and draw meaningful conclusions.</li> <li>• Introduce statistical software often used in the field of social sciences.</li> </ul>	MATH 210 Statistical Inference

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<b>Program Goal</b>	
<p><b>Goal 6:</b> Provide a solid foundation of mathematical skills to students studying nursing and the allied health professions specifically through applications relevant to these courses of study.</p>	
<b>Course Level Goals</b>	<b>Courses meeting Program Goal 6</b>
<p>Foundational course goals:</p> <ul style="list-style-type: none"> <li>• Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.</li> <li>• Represent mathematical information symbolically, visually, numerically, and verbally.</li> <li>• Use arithmetical, algebraic, and statistical methods to solve problems.</li> <li>• Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.</li> <li>• Recognize that mathematical and statistical methods have limits.</li> </ul>	<p>MATH 108 Finite Mathematics</p>
<p>Course goals:</p> <ul style="list-style-type: none"> <li>• Teach students to think and analyze critically, armed with statistical savvy, to validate and/or question data uncovered through various means in daily life.</li> <li>• Show students a purpose and relevance present in statistical analysis, particularly in the field of social sciences.</li> <li>• Introduce students to the scope and usefulness of an understanding of statistics with practical and relevant real life examples and data, both given to and collected by the students.</li> </ul>	<p>MATH 110 Introduction to Statistics</p>



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<b>Program Goal</b>	
<b>Goal 7:</b> Provide students with the mathematical knowledge necessary to pursue a degree in Chemistry or Biology, specifically through applications relevant to these courses of study.	
<b>Course Level Goals</b>	<b>Courses meeting Program Goal 7</b>
Foundational course goals: <ul style="list-style-type: none"> <li>• Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.</li> <li>• Represent mathematical information symbolically, visually, numerically, and verbally.</li> <li>• Use arithmetical, algebraic, and statistical methods to solve problems.</li> <li>• Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.</li> <li>• Recognize that mathematical and statistical methods have limits.</li> </ul>	MATH 102
Course Goals: <ul style="list-style-type: none"> <li>• Prepare and motivate students with the skills necessary for success in calculus</li> <li>• Develop and hone skills for graphing and solving problems involving a variety of functions including polynomials, trigonometric functions, exponentials, and logarithms</li> <li>• Create a solid foundation for trigonometric functions, with an emphasis on the unit circle</li> </ul>	MATH 123 Precalculus
Course Goals: <ul style="list-style-type: none"> <li>• Enhance students' knowledge of a variety of functions (trigonometric, exponential, logarithmic, polynomial, and rational)</li> <li>• Introduce and apply fundamental ideas of calculus (limits, continuity, differentiation, integration).</li> </ul>	MATH 125 Calculus and Analytic Geometry I
Course Goals: <ul style="list-style-type: none"> <li>• Provide students intending to major in mathematics, natural sciences, and engineering with a second course in calculus</li> <li>• Extend the concept of integrals to a variety of applications, establishing several integration techniques</li> <li>• Provide an introduction to sequences and series.</li> </ul>	MATH 225 Calculus and Analytic Geometry II