



# STARK STATE COLLEGE

## GENERAL SYLLABUS

### Course Information

**Course Name:** Precalculus  
**Course Number:** MTH135

### Required Materials

**Textbook(s):** Precalculus- A Right Triangle Approach, 5<sup>th</sup> edition; Ratti, McWaters, Skrzypek, Bernards, & Fresh; Pearson, 2023  
 ISBN (Instant Access): 9780137519217

**Required Readings:** None

**Additional Materials:** A graphing calculator is required. The math department supports the TI 83 or 84. The instructor reserves the right to limit use of the graphing calculator for specific topics on tests and quizzes. Specific models prohibited: Casio CFX-9970G, Casio Algebra fx 2.0, Hewlett-Packard HP40G, TI-89/92 and NSpire

### Course Outline/Calendar

The date of coverage and order of coverage may be modified based on the faculty member and events beyond the control of faculty members that interfere with class times and teaching.

#### 16 Week Calendar

Week	Chapter/Topic/Lab
1	<b>Ch 2 Graphs and Functions</b> <ul style="list-style-type: none"> <li>• Symmetries of graphs &amp; equation of a circle</li> <li>• Relations and functions</li> <li>• Properties of functions</li> <li>• A library of common functions</li> <li>• Transformations of functions</li> </ul>
2	<b>Ch 2 Graphs and Functions</b> <ul style="list-style-type: none"> <li>• Combining functions; composite functions</li> <li>• Inverse functions</li> </ul> <b>Ch 3 Polynomial and Rational Functions</b> <ul style="list-style-type: none"> <li>• Polynomial/Power functions and end behavior</li> <li>• Zeros and turning points</li> <li>• Graphing polynomial functions</li> </ul>

Week	Chapter/Topic/Lab
	<ul style="list-style-type: none"> <li>• <b>Test: Chapter 2</b></li> </ul>
3	<b>Ch 3 Long division and synthetic division</b> <ul style="list-style-type: none"> <li>• Remainder and Factor Theorems</li> <li>• Descartes' Rule of Signs</li> <li>• Zeros of polynomials: Bounds on real zeros</li> <li>• Zeros of polynomials: Conjugate pairs theorem</li> </ul>
4	<b>Ch 3 Polynomial and Rational Functions</b> <ul style="list-style-type: none"> <li>• Find the domain of a rational function.</li> <li>• Analyze graphs of rational functions.</li> <li>• Find horizontal and vertical asymptotes.</li> <li>• Graph rational functions</li> <li>• Solve quadratic and polynomial inequalities.</li> <li>• Solve rational inequalities.</li> <li>• <b>Test: Chapter 3</b></li> </ul>
5	<b>Ch 4 Exponential and Logarithmic Functions</b> <ul style="list-style-type: none"> <li>• Exponential and Logarithmic functions</li> <li>• The natural exponential function</li> <li>• Properties of logarithms</li> <li>• Exponential and logarithmic equations</li> <li>• Rules of Logarithms</li> <li>• <b>Test: Chapter 4</b></li> </ul>
6	<b>Ch 10 The Conic Sections</b> <ul style="list-style-type: none"> <li>• The parabola and its applications</li> <li>• The ellipse and its applications</li> <li>• The Hyperbola and its applications</li> <li>• <b>Test: Chapter 10</b></li> </ul>
7	<b>Ch 11 Further Topics in Algebra</b> <ul style="list-style-type: none"> <li>• Sequences and series</li> <li>• Arithmetic and Geometric sequences and series</li> </ul>
8	<b>Ch 11 Sequences and Series</b> <ul style="list-style-type: none"> <li>• <b>Test: Chapter 11</b></li> <li>• <b>Exam: Midterm</b></li> </ul>
9	<b>Ch 5 Trig Functions</b> <ul style="list-style-type: none"> <li>• Angles and angle measure</li> <li>• Right angle trigonometry</li> <li>• Trigonometric functions; the unit circle</li> <li>• Trigonometric functions of any angle;</li> <li>• The unit circle</li> <li>• Graphs of the trigonometric functions</li> <li>• <b>Test: Chapter 5</b></li> </ul>
10	<b>Ch 6 Analytic Trigonometry</b> <ul style="list-style-type: none"> <li>• Inverse trigonometric functions; Review</li> <li>• Trigonometric identities and equations</li> </ul>
11	<b>Ch 6 Analytic Trigonometry</b> <ul style="list-style-type: none"> <li>• Sum and difference formulas</li> <li>• Double and half-angle formulas</li> <li>• Product to sum and sum to product formulas</li> <li>• Trigonometry equations</li> <li>• <b>Test: Chapter 6</b></li> </ul>
12	<b>Ch 7 Applications of Trigonometric Functions</b> <ul style="list-style-type: none"> <li>• The Law of Sines</li> </ul>
13	<b>Ch 7 Applications of Trigonometric Functions</b>

Week	Chapter/Topic/Lab
	<ul style="list-style-type: none"> <li>• Matrices and systems of equations</li> <li>• The Law of Cosines</li> <li>• Vectors</li> <li>• Polar Coordinates</li> </ul>
14	<b>Ch 8 Systems of Equations &amp; Ch 9 Matrices</b> <ul style="list-style-type: none"> <li>• Systems of equations in three variables</li> <li>• Matrix Algebra</li> <li>• Test: Chapter 7</li> </ul>
15	<b>Matrices/Determinants</b> <ul style="list-style-type: none"> <li>• The matrix inverse</li> <li>• Determinants and Cramer's Rule</li> <li>• Test: Chapters 8*/9</li> </ul>
16	<b>Final Exam</b>

### 8 Week Calendar

Week	Chapter/Topic/Lab
1	<b>Ch 2 Graphs and Functions</b> <ul style="list-style-type: none"> <li>• Symmetries of graphs &amp; equation of a circle</li> <li>• Relations and functions</li> <li>• Properties of functions</li> <li>• A library of common functions</li> <li>• Transformations of functions</li> <li>• Combining functions; composite functions</li> <li>• Inverse functions</li> </ul> <b>Ch 3 Polynomial and Rational Functions</b> <ul style="list-style-type: none"> <li>• Polynomial/Power functions and end behavior</li> <li>• Zeros and turning points</li> <li>• Graphing polynomial functions</li> </ul> <b>Test: Chapter 2</b>
2	<b>Ch 3 Long division and synthetic division</b> <ul style="list-style-type: none"> <li>• Remainder and Factor Theorems</li> <li>• Descartes' Rule of Signs</li> <li>• Zeros of polynomials: Bounds on real zeros</li> <li>• Zeros of polynomials: Conjugate pairs theorem</li> <li>• Find the domain of a rational function.</li> <li>• Analyze graphs of rational functions.</li> <li>• Find horizontal and vertical asymptotes.</li> <li>• Graph rational functions</li> <li>• Solve quadratic and polynomial inequalities.</li> <li>• Solve rational inequalities.</li> </ul> <b>Test: Chapter 3</b>

Week	Chapter/Topic/Lab
3	<p><b>Ch 4 Exponential and Logarithmic Functions</b></p> <ul style="list-style-type: none"> <li>• Exponential and Logarithmic functions</li> <li>• The natural exponential function</li> <li>• Properties of logarithms</li> <li>• Exponential and logarithmic equations</li> <li>• Rules of Logarithms</li> </ul> <p><b>Test: Chapter 4</b></p> <p><b>Ch 10 The Conic Sections</b></p> <ul style="list-style-type: none"> <li>• The parabola and its applications</li> <li>• The ellipse and its applications</li> <li>• The Hyperbola and its applications</li> </ul> <p><b>Test: Chapter 10</b></p>
4	<p><b>Ch 11 Further Topics in Algebra</b></p> <ul style="list-style-type: none"> <li>• Sequences and series</li> <li>• Arithmetic and Geometric sequences and series</li> </ul> <p><b>Test: Chapter 11</b></p> <p><b>Exam: Midterm</b></p>
5	<p><b>Ch 5 Trig Functions</b></p> <ul style="list-style-type: none"> <li>• Angles and angle measure</li> <li>• Right angle trigonometry</li> <li>• Trigonometric functions; the unit circle</li> <li>• Trigonometric functions of any angle;</li> <li>• The unit circle</li> <li>• Graphs of the trigonometric functions</li> </ul> <p><b>Test: Chapter 5</b></p> <p><b>Ch 6 Analytic Trigonometry</b></p> <ul style="list-style-type: none"> <li>• Inverse trigonometric functions; Review</li> <li>• Trigonometric identities and equations</li> </ul>
6	<p><b>Ch 6 Analytic Trigonometry</b></p> <ul style="list-style-type: none"> <li>• Sum and difference formulas</li> <li>• Double and half-angle formulas</li> <li>• Product to sum and sum to product formulas</li> <li>• Trigonometry equations</li> </ul> <p><b>Test: Chapter 6</b></p> <p><b>Ch 7 Applications of Trigonometric Functions</b></p> <ul style="list-style-type: none"> <li>• The Law of Sines</li> </ul>
7	<p><b>Ch 7 Applications of Trigonometric Functions</b></p> <ul style="list-style-type: none"> <li>• Matrices and systems of equations</li> <li>• The Law of Cosines</li> <li>• Vectors</li> <li>• Polar Coordinates</li> </ul>

Week	Chapter/Topic/Lab
8	<p data-bbox="332 132 860 163"><b>Ch 8 Systems of Equations &amp; Ch 9 Matrices</b></p> <ul data-bbox="381 170 868 231" style="list-style-type: none"> <li>• Systems of equations in three variables</li> <li>• Matrix Algebra</li> </ul> <p data-bbox="332 264 516 296">Test: Chapter 7</p> <p data-bbox="332 329 613 361"><b>Matrices/Determinants</b></p> <ul data-bbox="381 367 803 428" style="list-style-type: none"> <li>• The matrix inverse</li> <li>• Determinants and Cramer's Rule</li> </ul> <p data-bbox="332 462 565 493">Test: Chapters 8*/9</p> <p data-bbox="332 527 456 558"><b>Final Exam</b></p>