

Pre-Calculus 11

Instructor: Cecilia He

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Schedule: 10:25 am – 11:55 am (10:10 am – 11:25 am Wednesday)

Room: 109

RATIONALE

The general objectives of Pre-Calculus 11 are to develop algebraic reasoning and number sense, to develop trigonometric reasoning, and to develop algebraic and graphical reasoning through the study of functions and relations. The following mathematical processes have been integrated throughout the course: communication, problem solving, connections, mental mathematics and estimation, reasoning, technology, and visualization. Pre-Calculus 11 is designed to prepare students for Pre-Calculus 12 and for post-secondary programs that involve math and science.

BIG IDEAS

- Algebra allows us to **generalize** relationships through abstract thinking.
 - After solving a problem, can we extend it? Can we generalize it?
 - How can we take a contextualized problem and turn it into a mathematical problem that can be solved?
 - What are the similarities and differences between quadratic functions and linear functions? How are they connected?
- The meanings of, and **connections** between, operations extend to powers, radicals, and polynomials.
 - How are the different operations (+, -, x, ÷, exponents, roots) connected?
 - What are the similarities and differences between multiplication of numbers, powers, radicals, polynomials, and rational expressions?
 - How can we verify that we have factored a trinomial correctly?
- Quadratic **relationships** are prevalent in the world around us.
 - What are some examples of quadratic relationships in the world around us, and what are the similarities and differences between these?
 - Why are quadratic relationships so prevalent in the world around us?
 - How does the predictable pattern of linear functions extend to quadratic functions?
 - Why is the shape of a quadratic function called a parabola?

- Trigonometry involves using **proportional reasoning** to solve **indirect measurement** problems.
 - How is the cosine law related to the Pythagorean theorem?
 - How can we use right triangles to find a rule for solving non-right triangles?
 - How do we decide when to use the sine law or cosine law?
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RESOURCES

The text used in this course is *Pre-calculus 11 my WORKTEXT*. This text is very useful and will help you gain confidence with the material in this course.

EVALUATION

| | |
|-------------------|-----|
| Homework | 10% |
| Quizzes | 25% |
| Major Assignments | 25% |
| Unit Test | 25% |
| Final Exam | 15% |

****Any student caught cheating on homework, assignments, or tests will receive a 0 on the work. A second incident of cheating will result in parents and the principal being contacted****

*****Any student with an unexcused absence on the day of a test or quiz, will receive a mark of zero unless a note is provided from a parent/guardian, excusing the student from the missed class*****

Homework

I will check homework at the beginning of each class. I will give you one of the following marks.

0 --- incomplete, copied, or poor effort

5 --- complete, but poorly done OR about half of the questions are complete

10 --- a good effort was put into the homework, most of the questions are completed

Quizzes

I will have short quizzes about 2 or 3 times each week. The quizzes are for me to check your understanding, and for you to practice what you have learned.

Unit Tests and Exams

All tests are closed book. A non-graphing calculator is permitted. Unit tests, midterm and final exams contain multiple choice and short answer questions.

EXPECTATIONS:

- Adhere to the academic integrity policy
- Contact your teacher when help is needed
- Review feedback from assignments and tests, where applicable
- Work to complete the course in a timely manner
- Communicate respectfully

Cell Phones and Technology in the Classroom

Please hand in your cell phone before the class begins. You are allowed to use it when you told to do so.

I expect to have your full attention during class, just like you expect to have my full attention when talking to me.

Cheating and Plagiarism

Plagiarism and cheating will NOT be tolerated. First offence everyone involved gets zero. Second offence everyone involved will be asked to leave the course. I will often ask you to work together, but you cannot copy each other's work. When working together, you must show all your work and have individual responses to questions.

And most importantly: Own your learning. At the end of the day, **YOU** are the one who controls your success in this course. Stay on top of your work, recognize when you need to ask for help, and give it your all.

COURSE SCHEDULE

| UNIT | Section | Estimated Time |
|--|--|----------------|
| Unit 1 Roots and Powers | Square Roots and Cube Roots of Fractions The Real Number System Mixed and Entire Radicals Powers with Positive Rational Exponents Powers with Negative Rational Exponents Exponent Laws and Order of Operations | 1 week |
| Unit 2 Radical Operations and Equations | Simplifying Radical Expressions Adding and Subtracting Radical Expressions Multiplying and Dividing Radical Expressions Solving Radical Equations Graphically Solving Radical Equations Algebraically | 1 week |
| Unit 3 Solving Quadratic Equations | Factoring Trinomials of the Form $ax^2 + bx + c$ Factoring Polynomial Expressions Solving Quadratic Equations by Factoring Using Square Roots to Solve Quadratic Equations Developing and Applying the Quadratic Formula Interpreting the Discriminant | 2.5 weeks |
| Unit 4 Analyzing Quadratic Functions and Inequalities | Properties of a Quadratic Function Analyzing Quadratic Functions of the Form $y = a(x-p)^2 + q$ Equivalent Forms of the Equation of a Quadratic Function Analyzing Quadratic Functions of the Form $y = ax^2 + bx + c$ Modelling and Solving Problems with Quadratic Functions | 2.5 weeks |

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| | <p>Solving Linear and Quadratic Inequalities Graphically</p> <p>Solving Linear and Quadratic Inequalities Algebraically</p> | |
| <p>Unit 5 Trigonometry</p> | <p>Angles in Standard Position in Quadrant 1</p> <p>Angles in Standard Position in All Quadrants</p> <p>Coterminal Angles</p> <p>The Sine Law</p> <p>The Cosine Laws</p> | <p>2 weeks</p> |
| <p>Unit 6 Rational Expressions and Equations</p> | <p>Equivalent Rational Expressions</p> <p>Multiplying and Dividing Rational Expressions</p> <p>Adding and Subtracting Rational Expressions with Monomial</p> <p>Adding and Subtracting Rational Expressions with Binomial and Trinomial</p> <p>Solving Rational Equations</p> <p>Applications of Rational Equations</p> | <p>1.5 weeks</p> |
| <p>Unit 7 Financial Literacy</p> | <p>Simple Interest</p> <p>Compound Interest</p> <p>Annuities: Investments and Loans</p> <p>Project: Buying or Leasing a Vehicles; Owning or Renting a Home</p> | <p>2 weeks</p> |
| <p>Final Review</p> | | <p>1 week</p> |