LSU Dual Enrollment Program for Math

 COURSE PROFILE

Content Revised 4-4-2022

**COURSE NAME: Algebra III (1 semester, prep for LSU’s Math 1021 College Algebra)**

**HIGH SCHOOL COURSE CODE: 160375\***

**PRIMARY ONLINE CONTENT SOURCE: *Algebra & Trigonometry, 2e,* *MyMathLab*, Kirk Trigsted**

**COURSE/UNIT CREDIT: ½ Carnegie Unit for fall semester**

**GRADE(S): 10, 11, or 12**

**\*This content described below is designed to be taught in the fall semester and then paired with Math 1021 College Algebra (1 Carnegie unit) for dual enrollment in the spring semester.**

 **CHAPTERS**

**R – Review**

**1 – Equations and Inequalities**

**6 – An Introduction to Trigonometric Functions**

**7 – The Graphs of Trigonometric Functions**

**8 – Trigonometric Identities**

**9 – Applications of Trigonometry**

| **SECTION NAMES (NUMBER OF EXERCISES) AND LEARNING OBJECTIVES** |
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| **CHAPTER R: Review**  |
| **R.1 Real Numbers (40)**Understand and classify real numbersDescribe sets of numbers using set-builder notation and interval notationDetermine the intersection and union of sets and intervalsUnderstand absolute value and use it to find distance |
| **R.2 Order of Operations and Algebraic Expressions (56)** Understand the properties of real numbersUse exponential notationUse the order of operations to simplify numeric and algebraic expressions |
| **R.3 Laws of Exponents; Radicals (75)**Simplify exponential expressions involving integer exponentsSimplify radical expressionsSimplify exponential expressions involving rational exponents |
| **R.4 Polynomials (37)**Understand the definition of a polynomialAdd and subtract polynomialsMultiply polynomialsDivide polynomials using long division |
| **R.5 Factoring Polynomials (55)**Factor out a greatest common factorFactor by groupingFactor trinomials with a leading coefficient equal to oneFactor trinomials with a leading coefficient not equal to oneFactor using special factoring formulas |
| **R.6 Rational Expressions (59)**Simplify rational expressionsMultiply and divide rational expressionsAdd and subtract rational expressionsSimplify complex rational expressions |
| **CHAPTER 1: Equations, Inequalities, and Applications**  |
| **1.1 Linear Equations (42)**Find the least common denominator of an expressionRecognize linear equationsSolve linear equations with integer coefficientsSolve linear equations involving fractionsSolve linear equations involving decimalsSolve equations that lead to linear equations |
| **1.4 Quadratic Equations (39)**Simplify radical expressionsFactor trinomialsSolve quadratic equations by factoringSolve quadratic equations using the square root propertySolve quadratic equations using the quadratic formulaUse the discriminant to determine the type of solutions of a quadratic equation |
| **CHAPTER 6: An Introduction to Trigonometric Functions** |
| **6.1 An Introduction to Angles: Degree and Radian Measure (50)**Understand degree measureUnderstand radian measureConvert between degree measure and radian measureFind coterminal angles using degree measureFind coterminal angles using radian measure |
| **6.3 Triangles (20)**Classify trianglesUse the Pythagorean TheoremUnderstand similar trianglesUnderstand the special right triangles |
| **6.4 Right Triangle Trigonometry (52)**Understand the right triangle definitions of the trigonometric functionsUse the special right trianglesUnderstand the fundamental trigonometric identitiesUnderstand cofunctionsEvaluate trigonometric functions using a calculator |
| **6.5 Trigonometric Functions of General Angles (84)**Understand the four families of special anglesUnderstand the definitions of the trigonometric functions of general anglesFind the values of the trigonometric functions of quadrantal anglesUnderstand the signs of the trigonometric functionsDetermine reference anglesEvaluate trigonometric functions of angles belonging to  families |
| **CHAPTER 7: The Graphs of Trigonometric Functions** |
| **7.1 Graphs of Sine and Cosine Functions (49)**Perform operations on fractions containing *π*Understand graph of the sine function and its propertiesUnderstand graph of the cosine function and its propertiesDetermine properties and sketch graphs of form  and Determine properties and sketch graphs of form  and Determine properties and sketch graphs of form  and Determine equation of a function of the form  and  given graph |
| **CHAPTER 8: Trigonometric Identities, Formulas, and Equations** |
| **8.1 Trigonometric Identities (36)**Review and use the fundamental identitiesVerify trigonometric identities |
| **CHAPTER 9: Applications of Trigonometry** |
| **9.1 Right Triangle Applications (18)**Solve right trianglesSolve applied problems using right triangles |
| **9.2 The Law of Sines (30)** Determine if the Law of Sines can be used to solve an oblique triangleUse the Law of Sines to solve the SAA case or the ASA caseUse the Law of Sines to solve the SSA (ambiguous) case |
| **9.3 The Law of Cosines (27)** Use a calculator to approximate trig and inverse trig expressionsDetermine whether Law of Sines or Cosines should be used to solve an oblique triangleUse the Law of Cosines to solve the SAS caseUse the Law of Cosines to solve the SSS caseUse the Law of Cosines to solve applied problems involving oblique triangles |
| **9.4 Area of Triangles (17)** Determine the area of oblique trianglesUse Heron’s Formula to determine the area of an SSS triangleSolve applied problems involving the area of triangles |