**LSU Dual Enrollment Program for Math**

**COURSE PROFILE**

**Content Revised June 2024**

|  |  |
| --- | --- |
| **COURSE NAME** | **LSU Math 1022 Plane Trigonometry** |
| **COMMON COURSE NUMBER** | **CMAT 1223 Trigonometry** |
| **PRIMARY ONLINE CONTENT SOURCE** | ***Algebra and Trigonometry, 4e,* *MyMathLab***  Kirk Trigsted |
| **COURSE/UNIT CREDIT** | **3 credit hours, 1 Carnegie Unit** |
| **GRADE(S)** | **10, 11, or 12** |

**CHAPTERS FOR MATH 1022 TRIGONOMETRY**

|  |  |
| --- | --- |
| **6 - An Introduction to Trigonometric Functions** | **9 - Applications of Trigonometry** |
| **7 - The Graphs of Trigonometric Functions** | **10 - Polar Equations, Complex Numbers, and Vectors** |
| **8 - Trigonometric Identities, Formulas, and Equations** |  |

**SECTION NAMES (NUMBER OF EXERCISES) AND LEARNING OBJECTIVES FOR MATH 1022 TRIGONOMETRY**

|  |
| --- |
| **CHAPTER 6: An Introduction to Trigonometric Functions** |
| **6.1 An Introduction to Angles: Degree and Radian Measure (48)**  Understand degree measure  Understand radian measure  Convert between degree measure and radian measure  Find coterminal angles using degree measure  Find coterminal angles using radian measure |
| **6.2 Applications of Radian Measure (18)**  Determine the area of a sector of a circle  Determine the arc length of a sector of a circle |
| **6.3 Triangles (18)**  Classify triangles  Use the Pythagorean Theorem  Understand similar triangles  Understand the special right triangles |
| **6.4 Right Triangle Trigonometry (44)**  Understand the right triangle definitions of the trigonometric functions  Use the special right triangles  Understand the fundamental trigonometric identities  Understand cofunctions  Evaluate trigonometric functions using a calculator |

|  |
| --- |
| **6.5 Trigonometric Functions of General Angles (73)**  Understand the four families of special angles  Understand the definitions of the trigonometric functions of general angles  Find the values of the trigonometric functions of quadrantal angles  Understand the signs of the trigonometric functions  Determine reference angles  Evaluate trigonometric functions of angles belonging to *π/3*, *π/4*, and *π/6* families |
| **6.6 The Unit Circle (12)**  Understand the definition of the unit circle  Understand the unit circle definitions of the trigonometric functions |
| **CHAPTER 7: The Graphs of Trigonometric Functions** |
| **7.1 Graphs of Sine and Cosine Functions (45)**  Understand the graph of the sine function and its properties  Understand the graph of the cosine function and its properties  Determine properties and sketch graphs of the form *y=Asinx* and *y=Acosx*  Determine properties and sketch graphs of the form *y=sinBx* and *y=cosBx*  Determine properties and sketch graphs of the form *y=AsinBx* and *y=AcosBx*  Determine the equation of a function of the form *y=AsinBx* and *y=AcosBx* given its graph |
| **7.2a More on the Graphs of Sine and Cosine: Phase Shift (21)**  Determine properties and sketch graphs of the form *y=sin(x-C)* and *y=cos(x-C)*  Determine properties and sketch graphs of the form *y=Asin(Bx-C)* and *y=Acos(Bx-C)* |
| **7.2b More on the Graphs of Sine and Cosine: Vertical Shift (15)**  Determine properties and sketch graphs of the form *y=Asin(Bx-C)+D* and *y=Acos(Bx-C)+D* |
| **7.3 The Graphs of Tangent, Cotangent, Cosecant, and Secant Functions (34)**  Understand the graph of the tangent function and its properties  Determine properties and sketch graphs of the form *y=Atan(Bx-C)+D*  Understand the graph of the cotangent function and its properties  Determine properties and sketch graphs of the form *y=Acot(Bx-C)+D*  Understand the graphs of the cosecant and secant functions and their properties |
| **7.4 Inverse Trigonometric Functions I (35)**  Understand and find the exact and approximate values of the inverse sine function  Understand and find the exact and approximate values of the inverse cosine function  Understand and find the exact and approximate values of the inverse tangent function |
| **7.5 Inverse Trigonometric Functions II (38)**  Evaluate composite inverse trigonometric functions of the form and  Evaluate composite inverse trigonometric functions of the form and |
| **CHAPTER 8: Trigonometric Identities, Formulas, and Equations** |
| **8.1 Trigonometric Identities (33)**  Review and use the fundamental identities  Verify trigonometric identities |
| **8.2 The Sum and Difference Formulas (35)**  Use the sum and difference formulas for the cosine function  Use the sum and difference formulas for the sine function  Use the sum and difference formulas for the tangent function  Use sum and difference formulas to evaluate expressions involving inverse trig functions |
| **8.3 The Double-Angle and Half-Angle Formulas (46)**  Use the double-angle formulas  Use the half-angle formulas  Use the double-angle and half-angle formulas to evaluate expressions involving inverse trig functions |
| **8.5 Trigonometric Equations (43)**  Solve trigonometric equations that are linear in form  Solve trigonometric equations that are quadratic in form  Solve trigonometric equations using identities  Solve trigonometric equations using a calculator |
| **CHAPTER 9: Applications of Trigonometry** |
| **9.1 Right Triangle Applications (16)**  Solve right triangles  Solve applied problems using right triangles |
| **9.2 The Law of Sines (29)**  Determine if the Law of Sines can be used to solve an oblique triangle  Use the Law of Sines to solve the SAA case or the ASA case  Use the Law of Sines to solve the SSA (ambiguous) case  Use the Law of Sines to solve applied problems involving oblique triangles |
| **9.3 The Law of Cosines (22)**  Determine whether Law of Sines or Cosines should be used to solve an oblique triangle  Use the Law of Cosines to solve the SAS case  Use the Law of Cosines to solve the SSS case  Use the Law of Cosines to solve applied problems involving oblique triangles |
| **9.4 Area of Triangles (19)**  Determine the area of oblique triangles  Use Heron’s Formula to determine the area of an SSS triangle  Solve applied problems involving the area of triangles |
| **CHAPTER 10: Polar Equations, Complex Numbers, and Vectors** |
| **10.1 Polar Coordinates and Equations (62)**  Plot points using polar coordinates  Determine different representations of a point *(r, θ)*  Convert from polar to rectangular coordinates  Convert from rectangular to polar coordinates  Convert equations from rectangular to polar form  Convert equations from polar to rectangular form |
| **10.2 Graphs of Polar Equations (67)**  Sketch equations of the form *rcosθ = a*, *rsinθ = a*, *arcosθ + brsinθ = c*, and *θ = α*  Sketch equations of the form *r = a*, *r = asinθ*, and *r = acosθ*  Sketch equations of the form *r = a + bsinθ* and *r = a + bcosθ*  Sketch equations of the form *r = asin(nθ)* and *r = acos(nθ)*  Sketch equations of the form *r2 = a2sin(2θ)* and *r2 = a2cos(2θ)* |
| **10.4 Vectors (31)**  Determine magnitudes of vectors that are represented geometrically  Perform operations on vectors that are represented geometrically  Determine components and magnitudes of vectors  Write vectors in terms of *i* and *j*  Perform operations on vectors written in *ai+bj* form and find magnitudes  Find unit vectors  Determine direction angles of vectors  Write vectors in the form *v=ai+bj* given magnitudes and direction angles  Solve applied problems involving velocity using vectors |