



**NIDA CORPORATION
COMPUTER ASSISTED INSTRUCTION**

LESSON AND OBJECTIVE LISTING

**Master Course Listing
Mathematics**

2018-08-30

Representative



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OBJECTIVE LISTING - Master Course Listing

TABLE OF CONTENTS

THEORY - MATH

MOD 82 - BASIC MATHEMATICS	1
MOD 83 - ALGEBRA	2
MOD 84 - TRIGONOMETRY	4
MOD 85 - CALCULUS	5
MOD 86 - COMPUTER MATH	7
MOD 87 - MEASUREMENTS	8

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OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 82 - BASIC MATHEMATICS

2011-112-130 Adding and Subtracting	---
<ul style="list-style-type: none"> ▪ Describe the decimal number system. ▪ Describe the whole number line. ▪ Describe addition. ▪ Add whole numbers. ▪ Describe subtraction. ▪ Subtract whole numbers. 	
2011-112-160 Multiplying and Dividing	---
<ul style="list-style-type: none"> ▪ Describe multiplication. ▪ Multiply whole numbers. ▪ Describe division. ▪ Divide whole numbers. 	
2011-112-190 Fractions	---
<ul style="list-style-type: none"> ▪ Describe fractions. ▪ Describe proper and improper fractions. ▪ Change improper fractions to whole numbers or mixed numbers. ▪ Change mixed numbers to improper fractions. ▪ Reduce fractions to the lowest terms. 	
2011-112-220 Fraction Operations	---
<ul style="list-style-type: none"> ▪ Add fractions. ▪ Subtract fractions. ▪ Multiply fractions. ▪ Divide fractions. 	
2011-112-250 Decimal Fractions	---
<ul style="list-style-type: none"> ▪ Describe decimal fractions. ▪ Recognize positional values in decimal fractions. ▪ Convert decimal fractions to standard fractions. ▪ Convert standard fractions to decimal. ▪ Add decimal fractions. ▪ Subtract decimal fractions. ▪ Multiply decimal fractions. ▪ Divide decimal fractions. 	
2011-112-280 Signed Numbers	---
<ul style="list-style-type: none"> ▪ Describe signed numbers. ▪ Describe the signed number line. ▪ Determine the relationship between two signed numbers. ▪ Add signed numbers. ▪ Subtract signed numbers. ▪ Multiply signed numbers. ▪ Divide signed numbers. 	
2011-112-310 Percents	---
<ul style="list-style-type: none"> ▪ Describe percents. ▪ Change percents to decimal numbers. ▪ Change decimal numbers to percents. ▪ Calculate the percentage part. ▪ Calculate the percentage rate. ▪ Calculate the percentage base. 	

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 82 - BASIC MATHEMATICS (cont.)

- 2011-112-340 Exponents and Square Roots ---
- Describe exponents.
 - Calculate the result of numbers that use exponents.
 - Describe square roots.
 - Calculate square roots.
- 2011-112-370 Metric Notation ---
- Convert decimal numbers to powers of ten and vice versa.
 - Convert decimal numbers to metric prefixes and vice versa.
 - Add, subtract, multiply, and divide powers of ten.
 - Add, subtract, multiply, and divide metric prefixes.
- 2011-112-920 Basic Mathematics Post-Test (Theory) ---

MOD 83 - ALGEBRA

- 2011-212-130 Fundamentals of Algebra ---
- Describe real numbers.
 - Describe the four fundamental operations of real numbers.
 - Describe real number variables.
 - Describe the order of operations.
 - Combine variables.
 - Describe real number properties - closure, commutative, associative, identity, inverse, distributive.
- 2011-212-160 Linear Equations ---
- Describe addition and subtraction laws.
 - Solve $X + A = B$ type of equations.
 - Solve $X - A = B$ type of equations.
 - Describe multiplication and division laws.
 - Solve $X \times A = B$ type of equations.
 - Solve $X \div A = B$ type of equations.
 - Describe a formula.
 - Place a word problem in an equation.
 - Solve for the unknown quantity.
- 2011-212-190 Solving Linear Equations ---
- Use the basic laws of equations to solve linear equations.
 - Solve problems in the format of $ax + b = c$ and $ax - b = c$.
 - Solve problems in the format of $x/a + b = c$.
 - Use the four-step process to solve word problems.
 - Solve word problems in the format of linear equations.
- 2011-212-220 Exponents and Monomials ---
- Define exponents.
 - Multiply and divide powers with the same base.
 - Raise a power to a power.
 - Raise a product or quotient to a power.
 - Describe monomials.
 - Add and subtract monomials.
 - Multiply and divide monomials.
 - Use the 4 steps to solve word problems.

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 83 - ALGEBRA (cont.)

- 2011-212-220 Exponents and Monomials (cont.)
- Solve word problems that use monomials.
- 2011-212-250 Polynomials ---
- Define polynomials.
 - Add polynomials.
 - Subtract polynomials.
 - Multiply a monomial and a polynomial.
 - Multiply polynomials.
 - Describe special binomial products.
 - Divide polynomials by monomials.
- 2011-212-280 Factoring Polynomials ---
- Factor by finding the greatest common factor.
 - Factor by grouping.
 - Factor trinomials.
 - Factor by recognizing special binomial factors.
 - Solve equations by factoring.
 - Define quadratic equations and quadratic formula.
 - Solve equations using the quadratic formula.
 - Solve word problems.
- 2011-212-310 Roots and Radicals ---
- Factor radicand terms.
 - Simplify using the Product Property of Roots.
 - Simplify using the Product Quotient Property of Roots.
 - Rationalize denominators.
 - Multiply radicals.
 - Divide radicals.
 - Add radicals.
 - Subtract radicals.
 - Rationalize denominators.
 - Use the Squaring Property of Equations to solve for the unknown.
 - Solve equations containing one radical expression.
 - Solve equations containing two radical expressions.
- 2011-212-340 Graphs ---
- Describe the rectangular coordinate system.
 - Locate points on a rectangular coordinate system.
 - Find the coordinates of a point in a rectangular coordinate system.
 - Graph linear equations.
 - Find the slope of a line.
 - Find the equation of a line.
- 2011-212-370 Systems of Linear Equations ---
- Define a system of equations.
 - Solve systems of equations by graphing.
 - Identify consistent, inconsistent, and dependent systems by their graphs.
 - Solve systems of equations by substitution.
 - Identify consistent, inconsistent, and dependent systems by the results of substitution.
 - Solve systems of equations by addition.
 - Identify consistent, inconsistent, and dependent systems by the results of addition.

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 83 - ALGEBRA (cont.)

- 2011-212-400 Introduction to Statistics ---
- Understand the role of statistics in industry.
 - Understand the concepts of mean, median, mode, standard deviation, percentiles, and quartiles.
 - Understand the analysis of statistical data.
 - Understand the various statistical diagrams.
 - Understand the statistical histogram.
- 2011-212-920 Algebra Post-Test (Theory) ---

MOD 84 - TRIGONOMETRY

- 2011-214-130 Fundamentals of Trigonometry ---
- Define the term angle.
 - Identify positive angles and negative angles.
 - Identify acute, obtuse, complementary, and supplementary angles.
 - Identify angle measurements using degrees, minutes, and seconds.
 - Add and subtract angle measurements.
 - Understand the relationship between degrees and radians.
 - Convert degrees into radians.
 - Convert radians into degrees.
- 2011-214-160 Trigonometric Functions ---
- Find the measurement of an unknown angle in a right triangle.
 - Find the unknown side of a right triangle using the Pythagorean Theorem.
 - Identify the properties of the 45-45-90 and 30-60-90 right triangles.
 - Identify the six trigonometric functions.
 - Find the sine, cosine, tangent, cosecant, secant, and cotangent of a given angle.
 - Identify the relationships between the unit circle and the trigonometric functions.
- 2011-214-190 Graphing Trigonometric Functions ---
- Identify the basic graphs for the six trigonometric functions.
 - Define period and amplitude.
 - Define the period and amplitude for the six trigonometric functions.
 - Determine the amplitude of the sine and cosine functions.
 - Find the change in the period of a trigonometric function.
 - Determine the phase shift of a trigonometric function.
- 2011-214-220 Trigonometric Identities ---
- Understand the origins of the reciprocal and ratio identities.
 - Find the trigonometric function of an angle using either a reciprocal or ratio identity.
 - Find the trigonometric function of an angle using combinations of reciprocal and ratio identities.
 - Understand the origins of the Pythagorean and related identities.
 - Find the trigonometric function of an angle using the Pythagorean and related identities.
- 2011-214-250 Angle Formulas ---
- Know the sum and difference formulas for sine, cosine, and tangent.
 - Find the exact trigonometric function value of a given angle using the sum and difference formulas.
 - Know the double angle formulas for sine, cosine, and tangent.
 - Know the power reducing formulas for sine, cosine, and tangent.

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 84 - TRIGONOMETRY (cont.)

- 2011-214-250 Angle Formulas (cont.)
- Know the half-angle formulas for sine, cosine and tangent.
 - Use the proper formula to find the exact trigonometric value of a given angle.
- 2011-214-280 Inverse Trigonometric Functions ---
- Understand the methods for finding the inverse trigonometric functions.
 - Know the domains, ranges, and graphs of arcsine, arccosine, and arctangent.
 - Solve problems involving arcsine, arccosine, and arctangent.
 - Know the domains, ranges, and graphs of arcsecant, arcsecant, and arccotangent.
 - Solve problems involving arcsecant, arcsecant, and arccotangent.
- 2011-214-310 Applications of Trigonometry ---
- Identify an oblique triangle.
 - Use the law of sines to find the missing parts of oblique triangles.
 - Understand the four possibilities resulting from the ambiguous case.
 - Use the law of cosines to solve oblique triangles when given two sides and the included angle.
 - Use the law of cosines to solve oblique triangles when given three sides.
- 2011-214-340 Graphing Polar Equations ---
- Define the polar coordinate pair.
 - Graph polar coordinates.
 - Understand the techniques for graphing polar equations.
 - Recognize and graph basic polar equations.
- 2011-214-370 Conic Sections: Circles and Parabolas ---
- Recognize the general equation for a circle.
 - Find the center and radius of a circle from a given equation.
 - Find the equation for a circle given the center and radius.
 - Recognize the general equations for parabolas.
 - Find the focus, vertex, and directrix of a parabola from a given equation.
 - Find the equation for a parabola given the focus, vertex, and/or directrix.
- 2011-214-400 Conic Sections: Ellipses and Hyperbolas ---
- Recognize the general equations for ellipses.
 - Find the center, vertices, and foci of an ellipse from a given equation.
 - Find the equation for an ellipse given the center, vertices, and foci.
 - Recognize the general equations for hyperbolas.
 - Find the center, vertices, foci, and asymptotes of a hyperbola from a given equation.
 - Find the equation for a hyperbola given the center, vertices, and foci.
- 2011-214-920 Trigonometry Post-Test (Theory) ---

MOD 85 - CALCULUS

- 2011-216-130 Fundamentals of Calculus ---
- Apply the slope formula to particles moving along straight paths.
 - Recognize functions and identify the domain and range.
 - Find the composite of two given functions.
 - Find the average rate of change of a function.
 - Understand the transition as a secant line becomes a tangent line when X goes to 0.
 - Find the slope at a given point on a curve.

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 85 - CALCULUS (cont.)

2011-216-160 Limits	---
<ul style="list-style-type: none"> ▪ Understand the concept of a limit. ▪ Recognize right-hand limits and left-hand limits. ▪ Find limit values. ▪ Understand the sandwich property. ▪ Understand how the sandwich property is used to find the limits of trigonometric functions. ▪ Find limits involving trigonometric functions. 	
2011-216-190 Limits: Continuity and Infinity	---
<ul style="list-style-type: none"> ▪ Identify continuous functions. ▪ Determine continuity at a point. ▪ Determine continuity over an interval. ▪ Understand how infinity is used as a limit. ▪ Identify the limit form as the variable approaches infinity. ▪ Find limits involving infinity. 	
2011-216-220 Derivatives	---
<ul style="list-style-type: none"> ▪ Understand the definition of a derivative. ▪ Find derivatives using the definition. ▪ Find derivatives using the constant rule, power rule, and sum rule. ▪ Find the derivative of the product of two functions. ▪ Find the derivative of the quotient of two functions. 	
2011-216-250 The Chain Rule	---
<ul style="list-style-type: none"> ▪ Identify the chain rule. ▪ Find derivatives using the chain rule. ▪ Identify the derivatives of the six trigonometric functions. ▪ Find derivatives of functions using trigonometric expressions. 	
2011-216-280 Additional Differentiation Methods	---
<ul style="list-style-type: none"> ▪ Identify implicit functions. ▪ Find derivatives using implicit differentiation. ▪ Identify higher order derivatives. ▪ Find second and third derivatives of functions. ▪ Find the velocity and acceleration functions given the position function. 	
2011-216-310 Applications of Derivatives	---
<ul style="list-style-type: none"> ▪ Sketch curves using the first and second derivatives. ▪ Identify intervals where the function is increasing or decreasing. ▪ Locate local maximum or minimum points. ▪ Determine concavity. ▪ Find inflection points. ▪ Develop strategy for solving maxima-minima word problems. ▪ Solve max-min problems. 	
2011-216-340 Integration	---
<ul style="list-style-type: none"> ▪ Understand the relationship between integration and differentiation. ▪ Integrate simple algebraic indefinite integrals. ▪ Integrate simple trigonometric indefinite integrals. ▪ Identify integrals resulting from use of the chain rule. ▪ Integrate indefinite integrals using the u substitution method. 	
2011-216-370 Definite Integrals	---
<ul style="list-style-type: none"> ▪ Understand the relationship between the limits of integration and an interval of x values. 	

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 85 - CALCULUS (cont.)

- 2011-216-370 Definite Integrals (cont.)
- Identify upper and lower limits of integration.
 - Evaluate definite integrals.
 - Use definite integrals to find the area involving only positive regions.
 - Use definite integrals to find the area of both positive and negative regions.
- 2011-216-400 Applications of Definite Integrals ---
- Find the area of a region bounded by two curves.
 - Find the area of a region bounded by two curves and the x-axis.
 - Understand the theory of rotation about the x-axis.
 - Find the volume of an object formed by rotating $y = f(x)$ about the x-axis.
- 2011-216-920 Calculus Post-Test (Theory) ---

MOD 86 - COMPUTER MATH

- 2011-312-130 Fundamentals of Computer Math ---
- Understand concept of number systems other than base 10.
 - Add and subtract numbers of base N.
 - Convert numbers of base N to base 10.
 - Convert numbers of base 10 to base N.
 - Construct a base N multiplication table.
 - Multiply and divide base N numbers.
- 2011-312-160 The Binary System ---
- Add and subtract binary numbers.
 - Convert binary numbers to decimal numbers.
 - Convert decimal numbers to binary numbers.
 - Use BCD (8421) codes.
 - Use Gray codes.
 - Use ASCII codes.
 - Use Unicode.
- 2011-312-190 Octal and Hexadecimal Systems ---
- Perform computations using octal numbers.
 - Convert binary numbers to octal numbers.
 - Convert octal numbers to binary numbers.
 - Convert hexadecimal numbers to decimal numbers.
 - Convert decimal numbers to hexadecimal numbers.
 - Convert binary numbers to hexadecimal numbers.
 - Convert hexadecimal numbers to binary numbers.
- 2011-312-220 Logic Expressions ---
- Identify a valid logic statement.
 - Describe a negated logic statement.
 - Identify and use the "and" connector.
 - Identify and use the "or" connector.
 - Construct truth tables.
 - Identify conditional logic statements.
 - Identify and use the "If..., then..." connector.
 - Identify and use the "...if and only if..." connector.
 - Construct truth tables.

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 86 - COMPUTER MATH (cont.)

- 2011-312-220 Logic Expressions (cont.)
 - Decipher complex compound logic statements.
 - Understand logic arguments.
 - Construct truth tables.
- 2011-312-250 Boolean Algebra ---
 - Describe basic Boolean operations.
 - Describe basic properties of Boolean algebra.
 - Describe electronic circuits that perform basic Boolean algebra.
 - Describe sum of products equations.
 - Describe product of sums equations.
 - Describe complements.
- 2011-312-280 Gate Networks ---
 - Develop gate networks from sum of products equations.
 - Develop gate networks from product of sums equations.
 - Find the output of a gate network.
 - Develop a truth table for a gate network.
- 2011-312-310 Simplifying Boolean Equations ---
 - Review the basic principles of Boolean algebra.
 - Describe the rules of Boolean algebra.
 - Describe DeMorgan's theorems.
 - Use the basic principles, rules, and DeMorgan's theorems to simplify Boolean equations.
- 2011-312-340 Karnaugh Maps ---
 - Describe Karnaugh maps.
 - Develop a Karnaugh map for two, three, and four variables.
 - Simplify Boolean algebra equations using Karnaugh maps.
- 2011-312-370 Algorithms and Flowcharts ---
 - Describe the three basic computer operations.
 - Describe algorithms.
 - Describe flowcharts.
 - Recognize flowchart symbols.
- 2011-312-400 Sequences and Matrices ---
 - Define sequences.
 - Solve sequence problems.
 - Define matrices.
 - Solve matrix problems.
- 2011-312-920 Computer Math Post-Test (Theory) ---

MOD 87 - MEASUREMENTS

- 2011-412-130 Introduction to Linear Measurements ---
 - Become familiar with the two different standards of measurement.
 - Define precision and determine which measurement applications require more or less precision.
 - Identify the following measurement tools: standard ruler, micrometer, vernier caliper.
 - Define linear measurement.
 - Describe how the following measurement tools are used: standard ruler, micrometer, vernier caliper.

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 87 - MEASUREMENTS (cont.)

- 2011-412-160 Metric and Scientific Conversions ---
- Become familiar with units of British and metric units and be able to convert from one to the other.
 - Become familiar with the concepts of scientific notation and be able to add, subtract, multiply, and divide values in scientific notation.
- 2011-412-190 Angular and Circular Measurements ---
- Become familiar with some basic concepts of angular and circular characteristics including: angle, diameter, and radius.
 - Describe angular measurement using: try square, carpenter's square, protractor, sliding T-bevel, and combination square.
 - Describe diameter and radius measurements using calipers, micrometers, and vernier calipers.
- 2011-412-220 Area Measurements ---
- Define rectangles and squares.
 - Determine the difference between the two.
 - Use the area formula for squares and rectangles.
 - Define parallelograms and triangles.
 - Determine the relationship between the two.
 - Use the area formula for parallelograms and triangles.
 - Define a trapezoid.
 - Differentiate trapezoids from parallelograms.
 - Define the dimensions of a circle: radius, diameter, and circumference.
 - Use the formulas for area and circumference.
- 2011-412-250 Volume Measurements ---
- Define volume and describe how it relates to area.
 - Differentiate between liter, centimeter, and meter.
 - Solve problems of volume measurement in a solid rectangle.
 - Define and be able to recognize a prism.
 - Define and be able to recognize a pyramid.
 - Using the formulas for each, solve problems of prism and pyramid volume.
 - Define and be able to recognize a cylinder.
 - Define and be able to recognize a cone.
 - Define and be able to recognize a sphere.
 - Using the formulas for each, solve problems of cylinder, cone, and sphere volume.
- 2011-412-280 Velocity and Acceleration Measurements ---
- Define vector and scalar quantities and be able to differentiate between the two.
 - Define and be able to solve problems of velocity.
 - Define and be able to solve problems of acceleration.
- 2011-412-310 Force Measurements ---
- Describe force as it relates to inertia and Newton's First Law of Motion.
 - Describe force as it relates to acceleration and Newton's Second Law of Motion.
 - Describe force as it relates to interaction and Newton's Third Law of Motion.
- 2011-412-340 Work and Power Measurements ---
- Define work and be able to solve problems using the standard measure of work, the joule (J).
 - Define power and be able to solve problems using the standard measure of power, the watt (W).

OBJECTIVE LISTING - Master Course Listing

LESSON ID/TITLE

CARDS/KITS

MOD 87 - MEASUREMENTS (cont.)

2011-412-920 Measurements Post-Test (Theory) ---



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