

**NEW YORK CITY COLLEGE OF TECHNOLOGY**

**The City University of New York**

<b>DEPARTMENT:</b>	<b>Mathematics</b>
<b>COURSE:</b>	<b>MAT 1275CO</b>
<b>TITLE:</b>	<b>College Algebra and Trigonometry</b>
<b>DESCRIPTION:</b>	An intermediate and advanced algebra course. Topics include quadratic equations, systems of linear equations, exponential and logarithmic functions; topics from trigonometry, including identities, equations and solutions of triangles.
<b>TEXTS:</b>	<b>1)</b> Intermediate Algebra 2e, by Lynn Marecek and Andrea Honeycutt Mathis, et al. OpenStax: <a href="https://openstax.org/details/books/intermediate-algebra-2e">https://openstax.org/details/books/intermediate-algebra-2e</a> <b>2)</b> Algebra and Trigonometry by Jay Abramson, et al. OpenStax: <a href="https://openstax.org/details/books/algebra-and-trigonometry">https://openstax.org/details/books/algebra-and-trigonometry</a>
<b>CREDITS:</b>	4
<b>PREREQUISITES:</b>	CUNY proficiency in math OR credit for MAT1190/MAT1190CO  Updated Spring 2021 by H. Carley, B. Kan, A. Masuda, and T. Tradler

**A. Testing/Assessment Guidelines:**

The following exams should be scheduled:

1. A one-hour exam at the end of the First Quarter.
2. A one session exam at the end of the Second Quarter.
3. A one-hour exam at the end of the Third Quarter.
4. A one session Final Examination.

**B.** A scientific calculator is required.

### COURSE INTENDED LEARNING OUTCOMES

Course Learning Outcomes	General education Learning Outcomes	Required Core: Mathematical and Quantitative Reasoning
Be able to simplify and manipulate linear, quadratic, radical, rational, exponential, logarithmic, and trigonometric expressions.	FS: Transfer; Be able to refer to prior knowledge or skill and can apply such to new situations.	Be able to use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
Be able to solve equations involving linear, quadratic, radical, rational, exponential, logarithmic, or trigonometric expressions as well as systems of linear/quadratic equations.	Foundation and skills: Curiosity: Explore a topic in depth yielding insight indicating interest.; QL: Interpretation, presentation: Be able to explain information presented in mathematical forms and to convert relevant information into various mathematical forms.	Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
Be able to graphically solve equations involving linear and quadratic expressions (including systems of such). Be able to use the unit circle to solve trigonometric equations. Understand the relationships between solutions to equations and their graphs.	FS: Transfer; Be able to refer to prior knowledge or skill and can apply such to new situations. QL: Calculation, Application/Analysis: Be able to carry out accurate calculations in order to solve a problem and to make judgements and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis.	Be able to use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
Be able to frame word problems in terms of mathematical equations and/or graphs. Be able to interpret the mathematical solutions in terms of the original language of the problem.	FS: Independence, reflection: Pursue knowledge beyond classroom requirements and/or show interest in independent educational experiences and reviews prior learning leading to clarification and broader perspectives.	Be able to represent quantitative problems expressed in natural language in a suitable mathematical format and apply mathematical methods to problems in other fields of study.
Be able to write solutions of mathematical problems involving linear, quadratic, radical, rational, or trigonometric expressions with full detailed explanations.	QL: Communication: Be able to express quantitative evidence in support of the argument or purpose of the work.	Be able to effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
Be able to recognize errors in proposed solutions and explain in written or oral form the nature of such an error as well as be able to correct it. Be able to estimate solutions of equations using graphs.	FS: Initiative: Complete required work and identifies and pursues additional expansion or knowledge or skills. QL: Assumption. Be able to make and evaluate important assumptions in estimation and modeling.	Be able to evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.

**MAT 1275CO - College Algebra and Trigonometry  
Course Outline**

**Textbooks:** 1) Intermediate Algebra 2e by Lynn Marecek and Andrea Honeycutt Mathis, et al. OpenStax (Classes 1-25)  
2) Algebra and Trigonometry by Jay Abramson, et al. OpenStax (Classes 26-37)

**WeBWorK:** WeBWorK for MAT1275 uses the OpenLab Q&A site: Students will need an OpenLab account in order to post new questions.

Class	Lesson	Section	WeBWorK Set
1	Graph Linear Equations in Two Variables Slope of a Line Find the Equation of a Line	<u>3.1</u> : all examples <u>3.2</u> : all examples <u>3.3</u> : all examples	LinesReview GraphingLines LineLab
2	Solve Systems of Linear Equations with Two Variables	<u>4.1</u> : exclude Ex. 4.6	LinearSystems
3	Solve Systems of Equations with Three Variables Solve Systems of Equations Using Determinants (optional)	<u>4.4</u> : all examples <u>4.6</u> : exclude Ex. 4.52	3 × 3-Systems
4	Properties of Exponents and Scientific Notation	<u>5.2</u> : exclude Scientific Notation	IntegerExponents
5	Greatest Common Factor and Factor by Grouping	<u>6.1</u> : all examples	GCF-Grouping
6	Factor Trinomials Factor Special Products	<u>6.2</u> : exclude Ex. 6.14-6.18, 6.21, 6.22 <u>6.3</u> : exclude Ex. 6.23-6.26, 6.31-6.34	AC-Method DifferenceOfSquares
7	Polynomial Equations	<u>6.5</u> : exclude Ex. 6.50, 6.51, 6.55	ZeroProductProperty
8	Add and Subtract Rational Expressions  Simplify Complex Rational Expressions	<u>7.2</u> : exclude Ex. 7.22, 7.23  <u>7.3</u> : all examples	ReducingRationalExpressions AddRationalExpressions AddRationalExpressions2 ComplexFractions-Method1 ComplexFractions-Method2
9	Solve Rational Equations Applications with Rational Equations	<u>7.4</u> : exclude Ex. 7.40 <u>7.5</u> : Ex. 7.45, 7.46	FractionalEquations
10	Simplify Expressions with Roots  Simplify Rational Exponents	<u>8.1</u> : Ex. 8.1, 8.2, 8.7a, 8.8, 8.10, 8.12  <u>8.3</u> : Ex. 8.26, 8.27a, 8.28, 8.29-8.33 all	HigherRoots HigherRoots-Algebraic RationalExponents
11	Simplify Radical Expressions  Add, Subtract, and Multiply Radical Expressions	<u>8.2</u> : Ex. 8.13, 8.14a, 8.15a, 8.16a, 8.17a, 8.20a, 8.21a, 8.22a, 8.23a, 8.24a, 8.25a <u>8.4</u> : Ex. 8.36a, 8.37a, 8.38a, 8.39a	SimplifyingRadicals  AddSubtractRadicals
12	Multiply Radical Expressions	<u>8.4</u> : Ex. 8.40a, 8.41a, 8.42a, 8.43a, 8.44, 8.45a, 8.46	MultiplyRadicals
13	Divide Radical Expressions	<u>8.5</u> : Ex. 8.47a, 8.48a, 8.49, 8.50, 8.53, 8.54, 8.55	RationalizeDenominators
14	Solve Radical Equations	<u>8.6</u> : Ex. 8.56, 8.57, 8.58, 8.61, 8.62	RadicalEquations

Class	Lesson	Section	WeBWorK Set
15	Use the Complex Number System	<u>8.8</u> : Ex. 8.76-8.89 all	ComplexNumbers
16	Solve Quadratic Equations Using the Square Root Property Solve Quadratic Equations by Completing the Square	<u>9.1</u> : all examples  <u>9.2</u> : all examples	SquareRootProperty
17	Solve Quadratic Equations Using the Quadratic Formula	<u>9.3</u> : derive the quadratic formula, exclude Ex. 9.26	QuadraticFormula
18	Solve Applications of Quadratic Equations	<u>9.5</u> : exclude Ex. 9.40, 9.41	
19	Graph Quadratic Functions Using Properties Graph Quadratic Functions Using Transformations  Parabolas (optional)	<u>9.6</u> : all examples odd <u>9.7</u> : exclude Ex. 9.63  <u>11.2</u> : Ex. 11.15	ShiftingParabolas ParabolaLab ParabolaVertices-CtS ParabolaVertices-VertexFormula
20	Distance and Midpoint Formulas; Circles Perpendicular Bisectors	<u>11.1</u> : all examples Supplemental notes on Perpendicular Bisectors	DistanceFormula CircleLab Circles
21	Solve Systems of Nonlinear Equations	<u>11.5</u> : all examples	NonLinearSystems
22	Evaluate and Graph Exponential Functions	<u>10.2</u> : exclude Ex. 10.10-10.13	ExponentialFunctions
23	Evaluate and Graph Logarithmic Functions	<u>10.3</u> : exclude Ex. 10.22, 10.23, 10.26, 10.27	LogarithmicFunctions
24	Use the Properties of Logarithms	<u>10.4</u> : all examples	LogarithmicProperties
25	Solve Exponential and Logarithmic Equations	<u>10.5</u> : all examples	ExponentialEquations ExponentialEquations-Calc CompoundInterest
26	Angles	<u>7.1</u> : Ex. 1-8 all	AngleMeasure-Radians
27	Right Triangle Trigonometry	<u>7.2</u> : all examples	SolvingRightTriangles SpecialTriangles TrigonometryRatios
28-29	Unit Circle	<u>7.3</u> : all examples	UnitCircle
30	The Other Trigonometric Functions	<u>7.4</u> : exclude Ex. 4	CoordinatePlaneTrig
31	Graphs of the Sine and Cosine Functions Graphs of the Other Trigonometric Functions (optional)	<u>8.1</u> : Ex. 1, 2, 8 <u>8.2</u> : Ex. 1, 3	GraphingSineCosine
32	Inverse Trigonometric Functions	<u>8.3</u> : Ex. 1-4	SolvingRightTriangles-InverseTrig
33	Solving Trigonometric Equations with Identities	<u>9.1</u> : all examples	
34-35	Solving Trigonometric Equations	<u>9.5</u> : Ex. 1-5, 7-13, 17	TrigEquations
36	Non-right Triangles: Law of Sines	<u>10.1</u> : all examples	LawOfSines
37	Non-right Triangles: Law of Cosines	<u>10.2</u> : Ex. 1-4	LawOfCosines
	<b>Final Exam Review</b>		