NEW YORK CITY COLLEGE OF TECHNOLOGY
The City University of New York

DEPARTMENT:	Mathematics
COURSE:	MAT 1275CO
TITLE:	College Algebra and Trigonometry
DESCRIPTION:	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.
TEXTS:	A custom edition by McGraw-Hill: 1) Intermediate Algebra by Miller, O'Neill, and Hyde, 5th edition, and 2) Trigonometry by Coburn, 2nd edition
CREDITS:	4
PREREQUISITES:	CUNY proficiency in math OR credit for MAT 1190/MAT 1190CO.
	Updated Spring 2020 by H. Carley, A. Masuda, and K. Poirier

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 mathe matical 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: McGraw-Hill Custom Textbook containing material from:
1) Intermediate Algebra by Miller, O'Neill, and Hyde, 5th edition (Classes 1-21 and 34-37)
2) Trigonometry by Coburn, 2nd edition (Classes 22-33).

WeBWorK: WeBWorK for MAT 1275CO uses the OpenLab Q&A site: https://openlab.citytech.cuny.edu/ol-webwork/ Students will need an OpenLab account in order to post new questions.

Class	Lesson	Section	WeBWorK Set
1	Lines Review: - Equations: Slope-intercept and Point-slope - Slope Formula and Intercepts - Parallel and Perpendicular Through Points - Graphing	2.1, p.128-137 (skip Ex. 7) 2.2, p.145-151 (skip Ex. 1, 8) 2.3, p.157-160 (skip Ex. 4) 2.3, p.160-164	LinesReview GraphingLines LineLab
2	2-D Systems of Equations Substitution and Elimination	3.2, p.246-249 3.3, p.253-257 (skip Ex. 3-4) 3.4, p.261-265 (skip Ex. 3), Applications of Systems of Linear Equations in Two Variables (optional)	LinearSystems
3	3-D Systems of Equations	3.6, p.283-289	3×3-Systems
4	GCF Factoring and Factoring by Grouping	4.5, p.360-364 (skip Ex. 6)	GCF-Grouping
5	Difference of Squares and *ac*-method	4.6, p.368-377 4.7, p.382-383	DifferenceOfSquares AC-Method
6	Solving Equations by Using the Zero Product Rule	4.8, p.394-397 (skip Ex. 5)	ZeroProductProperty
7	Square Root Property and Completing the Square	7.1, p.582-587	SquareRootProperty
8	Quadratic Formula and Applications	7.2, p.592-602 (derive the quadratic formula)	QuadraticFormula
9	Complex Numbers	6.8, p.556-563	ComplexNumbers
10	Graphs of Quadratic Functions Vertex Formula and Standard Form	7.4, p.612-620 7.5, p.626-631 (skip Ex. 5)	ParabolaLab ShiftingParabolas ParabolaVertices-CtS ParabolaVertices-VertexFormula
11	Distance Formula (Pythagorean Theorem) Midpoint Formula Circles (complete the square and standard form) Perpendicular Bisector	9.1, p.754-759	DistanceFormula Circles CircleLab
12	Nonlinear Systems of Equations in Two Variables	9.4, p.784-788	NonLinearSystems
13	Rational Expressions Addition and Subtraction of Rational Expressions Multiplication and Division of Rational Expressions	5.1, p.422-428 (skip Ex. 1, 2, 5) 5.2, p.432-434 5.3, p.437-444	ReducingRationalExpressions AddRationalExpressions AddRationalExpressions2
14	Complex Fractions	5.4, p.447-452	ComplexFractions-Method1 ComplexFractions-Method2

Class	Lesson	Section	WeBWorK Set
15	Solving Rational Equations	5.5, p.454-460	FractionalEquations
16	Properties of Integer Exponents	4.1, p.320-323	IntegerExponents
17	Roots Rational Exponents	6.1, p.496-502 6.2, p.508-512	HigherRoots HigherRoots-Algebraic RationalExponents
18	Simplifying Radical Expressions Addition and Subtraction of Radicals	6.3, p.515-519 (skip Ex. 2, 5) 6.4, p.522-525	SimplifyingRadicals AddSubtractRadicals
19	Multiplication of Radicals	6.5, p.528-532 (skip Ex. 1c, 5b, 5c, 8)	MultiplyRadicals
20	Division of Radicals and Rationalization	6.6, p.536-543 (skip Ex. 1b, 2, 3b, 3c, 4, 6)	RationalizeDenominators
21	Solving Radical Equations	6.7, p.546-549 (skip Ex. 2, 3, 5)	RadicalEquations
22	Angle Measure Similar Triangles and Proportions	1.1, p.2-6 2.1, p.46-50	
23	Special Triangles	1.1, p.2-6	SpecialTriangles
24 -25	Trigonometric Ratios of Right Triangles Inverse Trigonometric Functions	2.2, p.54-56	TrigonometryRatios SolvingRightTriangles- InverseTrig
26	Solving Right Triangles Applications	2.3, p.63-66	SolvingRightTriangles
27	Angle Measure in Radian Trigonometry and the Coordinate Plane	3.1, p.90-93 1.3, p.22-27	AngleMeasure-Radians CoordinatePlaneTrig
28	Unit Circles	3.3, p.108-113	UnitCircle
29	Graphs of the Sine and Cosine Functions Graphs of the Tangent and Cotangent Functions (optional)	4.1, p.134-144 4.2, p.153-159	GraphingSineCosine
30	Fundamental Identities Proving Trigonometric Tautologies	1.4, p.31-35 5.1, p.212-214	
31	Trigonometric Equations	6.3, p.284-290	TrigEquations
32	Law of Sines	7.1, p.316-322	LawOfSines
33	Law of Cosines	7.2, p.329-332	LawOfCosines
34	Exponential Functions	8.3.1, 8.3.2, 8.3.4, p.680-686	ExponentialFunctions
35	Logarithmic Functions	8.4, p.690-693 and p.696-697	LogarithmicFunctions
36	Properties of Logarithms Compound Interest	8.5, p.704-709 8.6, p.712-715 (skip Ex. 3)	LogarithmicProperties CompoundInterest
37	Exponential Equations Applications to Compound Interest, Population Growth	8.7, p.726-734	ExponentialEquations ExponentialEquations-Calc
	Final Exam Review		