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

DEPARTMENT:	Mathematics
COURSE:	MAT 1275
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.
TEXT:	McGraw-Hill Custom Textbook containing material from: 1) Intermediate Algebra by Miller, O'Neill, and Hyde, 5th edition and 2) Trigonometry by Coburn, 2nd edition
CREDITS:	4 (6 hours instructional time)
PREREQUISITES:	MAT 1175 OR for New Students, scores of at least 45 on the Pre-Algebra part and 45 on the Algebra part of the CUNY Assessment Test in Mathematics.
	Prepared: Spring 2019

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/Assessment Methods

Learning Outcomes	Assessment Methods
1. Solve Linear equations. Rational equations. One-variable quadratic equations by factoring, completing the square, and the quadratic formula. Radical equations. Exponential and logarithmic equations. Systems of equations in 2 variables, both linear and non-linear. Systems of equations in 3 variables.	Classroom activities and discussion, homework, exams.
2. Perform operations with and simplify polynomial, rational, radical, complex, exponential, and logarithmic expressions.	Classroom activities and discussion, homework, exams.
3. Apply their knowledge of algebra and trigonometry to solve verbal problems.	Classroom activities and discussion, homework, exams.
4. Solve problems involving right and oblique triangles. Prove trigonometric identities. Solve trigonometric equations. Graph the sine and cosine function.	Classroom activities and discussion, homework, exams.
5. Apply the distance and midpoint formulas and determine the graphs of circles and parabolas	Classroom activities and discussion, homework, exams.

General Education Learning Outcomes/Assessment Methods

Learning Outcomes	Assessment Methods
1. Understand and employ both quantitative and qualitative analysis to solve problems.	Classroom activities and discussion, homework, exams.
2. Employ scientific reasoning and logical thinking.	Classroom activities and discussion, homework, exams.
3. Communicate effectively using written and oral means.	Classroom activities and discussion, homework, exams.
4. Use creativity to solve problems.	Classroom activities and discussion, homework, exams.

New York City College of Technology Policy on Academic Integrity

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog

MAT 1275 - 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 1-16 and 26-29)
2) Trigonometry by Coburn, 2nd edition (Classes 18-25).

WeBWorK: WeBWorK for MAT1275 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.

Video Resources: All video resources listed below can be found at https://openlab.citytech.cuny.edu/math1275videolibrary/syllabus-with-links-to-videos/

Class	Lesson	Section	Homework	WeBWorK Set	Video Resources
1	Properties of integer exponents Addition and subtraction of rational expressions	4.1, p.320-324 5.3, p.437-444	p.327: 11-29 odd, 33, 35, 41, 47, 63, 67, 75 p.445: 7-23, 27-49 odd	IntegerExponents ReducingRationalExpressions AddRationalExpressions AddRationalExpressions2	Adding and subtracting rational expressions Multiplying and dividing rational expressions
2	Complex fractions	5.4, p.447-452	p.452: 9-15, 17-23 odd, 31, 33	ComplexFractions-Method1 ComplexFractions-Method2	Nested fractions
3	Solving rational equations	5.5, p.454-460	p.460: 9-33 odd	FractionalEquations	Solving rational equations
4	Roots Rational exponents	6.1, p.496-502 6.2, p.508-512	p.505: 9-37 odd, 59, 65, 67, 79 p.513: 9, 13, 17, 19, 25, 29, 33, 41, 45, 53, 65, 73, 81, 93	HigherRoots HigherRoots-Algebraic	Rational exponents and radicals
5	Simplifying radical expressions Addition and subtraction of radicals	6.3, p.515-519 6.4, p.522-525	p.520: 9, 13, 17, 21, 25, 33, 39, 55, 59, 63, 79 p.526: 15, 19, 23, 35, 37, 41, 51, 55, 57, 61, 81	SimplifyingRadicals AddSubtractRadicals	Roots and radicals
6	Multiplication of radicals	6.5, p.528-532	p.534: 11, 17, 19, 21, 23, 25, 29, 31, 35, 37, 55, 57, 61, 63, 67, 77, 79, 87	MultiplyRadicals	Multiplication of radicals
7	Division of radicals and rationalization	6.6, p.536-543 (skip Ex.4, 6)	p.544: 11, 13, 17, 21, 31, 35, 39, 53, 57, 63, 67, 71, 77, 81		Division of radicals and rationalization
8	Solving radical equations	6.7, p.546-549	p.554: 13-18, 25-28, 41-46	RadicalEquations	Solving radical equations

Class	Lesson	Section	Homework	WeBWorK Set	Video Resources
9	**Exam 1** Complex numbers	6.8, p.556-563	p.564: 15-27, 31-35, 53-57, 61-69, 81-89 odd	ComplexNumbers	Complex numbers
10	Solving equations by using the zero product rule Square root property and completing the square	4.8, p.394-396 (skip Ex.2) 7.1, p.582-587	p.404: 21-40 p.589: 3-19, 27-33, 37-53 odd	 SquareRootProperty	Zero product property and solving quadratic equations by factoring The square root property
11	Quadratic formula	7.2, p.592-594, p.596-602, derive the quadratic formula	p.603: 9-25, 49-55 odd, 69, 73, 77, 81, 85	QuadraticFormula	The quadratic formula
12	Applications of quadratic equations	4.8, p.398-400 7.2, p.594-595	p.405: 65, 69, 71, 73, 75 p.603: 39-47 odd		Applications of the quadratic formula
13	Graphs of quadratic functions Vertex of a parabola	7.4, p.612-620 7.5, p.626-630	p.621: 11-15, 19-23, 29-35, 45, 47, 51-61 odd p.633: 17-23 odd, 29, 31, 37, 41, 43	ShiftingParabolas ParabolaVertices ParabolaVertices-CtS ParabolaVertices-VertexFormula	Graphs of quadratic functions Shifting parabolas
14	Distance formula, midpoint formula, and circles Perpendicular bisector	9.1, p.754-759	p.760: 5, 9, 11, 13, 23-31 odd, 39, 41, 45, 61, 63, 65, 69, 75 Supplemental problems on perpendicular bisectors	DistanceFormula Circles	Pythagorean Theorem Distance formula Midpoint formula Circles Perpendicular bisectors
15	Systems of linear equations in three variables	3.6, p.283-289	p.290: 11-17 odd, 21, 23, 27, 35-39 odd	3×3-Systems	Linear systems of three variables
16	Determinants and Cramer's rule (optional) Nonlinear systems of equations in two variables	A.1, p.A-1 to A-9 9.4, p.784-788	p.A-10: 35-45 odd, 49, 55, 57 p.790: 23-37 odd, 49	 NonLinearSystems	Determinants and Cramer's rule Nonlinear systems of equations
17	**Exam 2 (Midterm)**				
18	Angle measure and special triangles The trigonometry of right triangles	1.1, p.2-6 2.1, p.46-50	p.7: 45-57 odd p.51: 7-21 odd	SpecialTriangles TrigonometryRatios	Trigonometry of right triangles Special triangles
19	Solving right triangles Applications of static trigonometry	2.2, p.54-56 2.3, p.63-66	p.57: 7-47 odd p.69: 35-38	SolvingRightTriangles SolvingRightTriangles-InverseTrig	See videos from Class 18.

Class	Lesson	Section	Homework	WeBWorK Set	Video Resources
20	Angle measure in radian	3.1, p.90-93	p.95: 25-39 odd, 43, 45, 49-61 odd, 67-71 odd	AngleMeasure-Radians	Angle measure in radians
	Trigonometry and the coordinate plane	1.3, p.22-27	p.28: 25-31 odd, 45, 47, 55-63 odd, 64, 73-79 odd	CoordinatePlaneTrig	
21	Unit circles	3.3, p.108-113	p.115: 29-35 odd, 37-40	UnitCircle	Unit circle
22	Graphs of the sine and cosine functions	4.1, p.134-144	p.145: 1-3, 17-29 odd, 33-39 odd	GraphingSineCosine	Graphs of sine, cosine, and tangent
	Graphs of the tangent and cotangent functions (optional)	4.2, p.153-159	p.160: 15, 19, 21, 39, 43, 47		
23	Fundamental identities and families of identities	1.4, p.31-35	p.35: 11-37 odd		Pythagorean identity (The fundamental identity of trigonometry)
		5.1, p.212-214	p.216: 13-29 odd, 37, 43, 51		
24	Trigonometric equations	6.3, p.284-290	p.292: 13, 17, 21, 25, 31, 35, 43-49 odd, 79, 80	TrigEquations	Trigonometric equations
25	Oblique triangles and the law of sines	7.1, p.316-322	p.324: 7-23 odd	LawOfSines	Law of sines
	The law of cosines	7.2, p.329-332	p.338: 7-11 odd, 21-29 odd	LawOfCosines	Law of cosines
26	**Exam 3**				
	Exponential functions	8.3.1, 8.3.2, 8.3.4, p.680-686	p.687: 9-25 odd, 43, 49	ExponentialFunctions	Exponential functions
27	Logarithmic functions	8.4, p.690-693, and Ex.8, 9	p.699: 11-61 odd	LogarithmicFunctions	Logarithmic functions
28	Properties of logarithms	8.5, p.704-709	p.710: 17-29 odd, 45-55 odd, 63-64, 67-71, 79, 81, 91	LogarithmicProperties	Properties of logarithms
	Compound interest	8.6, p.712-715 (skip Ex.3)	p.721: 11,13	CompoundInterest	Compound interest
29	Logarithmic and exponential equations	8.7, p.726-734	p.735: 39-49 odd, 55-61 odd, 73, 75, 77, 79, 87	ExponentialEquations ExponentialEquations-Calc	Exponential equations
30	**Final Exam**				Selected final exam review questions solved