

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

DEPARTMENT: Mathematics

COURSE: MAT 1275EN

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: Custom Text by McGraw-Hill containing material from Intermediate Algebra, 3rd edition by Julie Miller, Molly O'Neill, and Nancy Hyde and Trigonometry, 2nd edition by John Coburn

CREDITS: 4 (6 hours class time)

PREREQUISITES: MAT 0650 or ACCUPLACER scores of at least 57 on the Elementary Algebra and between 30-59 on college-level math

Prepared by:
K. Andrew Parker
Spring 2017

- 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 <ul style="list-style-type: none"> - Linear equations. - Rational equations. - One-variable quadratic equations by factoring, completing the square, and the quadratic formula. - Radical equations. - Exponential and logarithmic equations. <ul style="list-style-type: none"> - Systems of equations in 2 variables, both linear and non-linear. - Systems of equations in 3 variables. 	Classroom activities and discussion, group work, homework or WeBWorK, quizzes, exams, final exam.
2. Perform operations with and simplify polynomial, rational, radical, complex, exponential, and logarithmic expressions.	Classroom activities and discussion, group work, homework or WeBWorK, quizzes, exams, final exam.
3. Apply their knowledge of algebra and trigonometry to solve verbal problems.	Classroom activities and discussion, group work, homework or WeBWorK, quizzes, exams, final exam.
4. <ul style="list-style-type: none"> - Solve problems involving right and oblique triangles. - Prove trigonometric identities. - Solve trigonometric equations. - Graph the sine and cosine function. 	Classroom activities and discussion, group work, homework or WeBWorK, quizzes, exams, final exam.
5. Apply the distance and midpoint formulas and determine the graphs of circles and parabolas	Classroom activities and discussion, group work, homework or WeBWorK, quizzes, exams, final exam.

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, group work, homework or WeBWorK, quizzes, exams, final exam.
2. Employ scientific reasoning and logical thinking.	Classroom activities and discussion, group work, homework or WeBWorK, quizzes, exams, final exam.

3. Communicate effectively using written and oral means.	Classroom activities and discussion, group work, reading and writing assignment.
4. Use creativity to solve problems.	Classroom activities and group discussion, group work, homework or WeBWork, open educational resources.

Mathematics Department Policy on Lateness/Absence

A student may be absent during the semester without penalty for 10% of the class instructional sessions. Students who stop attending the class (after attending at least once) without officially withdrawing from the course will receive the WU grade. The WU grade counts as an F in the computation of the GPA in credit bearing course.

The official Mathematics Department policy is that two latenesses (this includes arriving late or leaving early) is equivalent to one absence.

Every withdrawal (official or unofficial) can affect a student's financial aid status, because withdrawal from a course will change the number of credits or equated credits that are counted toward financial aid.

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

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

	TOPICS	Chapter, Section and Pages	Homework
1	Lines Review <ul style="list-style-type: none"> - Equations: Slope-Intercept and Point-Slope - Slope Formula and Intercepts - Parallel and Perpendicular through points - Graphing 	2.1 (Ex. 1-6, 8, 9) Linear Equations in Two Variables (pp. 128-137) 2.2 (Ex. 2-7) Slope of a Line and Rate of Change (pp. 145-151) 2.3 (Ex. 1-3) Equations of a Line (pp. 157-160) 2.3 (Ex. 4-8) Equations of a Line (pp. 160-164)	p. 140: 15-29 odd p. 154: 13-23 odd, 39-51 odd p. 167: 7-17 odd, 25-29 odd, 33-37 odd p. 168: 39-73 odd
2	2-D Systems of Equations Substitution and Elimination	3.2 (Ex. 1-3) Solving Systems of Linear Equations by the Substitution Method (pp. 246-249) 3.3 (Ex. 1, 2, 5) Solving Systems of Linear Equations by the Addition Method (pp. 253-257) 3.4 (Ex. 1, 2, 4, 5) Applications of Systems of Linear Equations in Two Variables (Optional) (pp. 261-265)	p. 251: 9-21 odd, 25, 35-37 all p. 258: 5-11 odd, 15, 19, 23, 33, 35, 41 p. 266: (Optional) 5, 9, 11, 17, 23, 29
3	3-D Systems of Equations	Chapter 3, Section 3.6, pages 283-289	p.290: 11-17 odd, 21, 23, 27, 35-39 odd
4	GCF Factoring and Factoring by Grouping	4.4 (Ex. 1-3) Division of Polynomials (pp. 350-354) 4.5 (Ex. 1-5) The Greatest Common Factor & Factoring by Grouping (pp. 360-364)	p. 357: 9-17 odd, 25, 27-30 all, 31-37 odd p. 366: 9-25 odd, 31-37 odd, 45-49 odd, 71 (G)
5	Difference of Squares and AC-Method	4.6 (Ex. 1-9) Factoring Trinomials (pp. 368-377) 4.7 (Ex. 1-3) Factoring Binomials (pp. 382-383)	p. 379: 9-35 odd, 55-58 all, 87, 88, 91, 93, 94, 95 p. 389: 11-17 all, 59, 60, 95 (G), 96 (G)
6	Solving Quadratic Equations with the Zero-Product Property	4.8 (Ex. 1-3, 7, 8) Solving Equations by Using the Zero Product Rule (pp. 394-399) Chapter 4, Section 4.8 pages 394-396 (omit example 2)	p. 404: 21-24 all, 29-39 odd, 46, 47, 49, 67 (G), 69 (G), 71 (G), 76 (G), 79 (G) p.404: 21-40
7	Square Root Property and Completing the Square	7.1 (Ex. 1-3) Square Root Property (pp. 582-583) Chapter 7, Section 7.1, pages 582-587	p. 589: 2-7 all, 10, 11, 13, 17 p.589: 3-19, 27-33, 37-53 odd
8	The Quadratic Formula	7.2 (Ex. 1, 3, 8) Quadratic Formula (pp. 592-600) Chapter 7, Section 7.2, pages 592-594, 596-602 (Derive the quadratic formula)	p. 603: 9, 12, 15-20 all, 23, 25, 41 (G), 43 (G), 77 p.603: 9-25, 49-55 odd, 69, 73, 77, 81, 85
9	The Imaginary Number, Complex Numbers	Chapter 6, Section 6.8, pages 557-563	p.564: 15-27, 31-35, 53-57, 61-69, 81-89 odd
10	Graphs of Quadratic Functions Vertex Formula and Standard Form	Chapter 7, Section 7.4, pages 612-620 Chapter 7, Section 7.5, pages 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

11	Distance Formula (Pythagorean Theorem) Midpoint Formula Circles (Complete the Square and Standard Form)	Chapter 9, Section 9.1, pages 754-759	p.760: 5,9,11,13,23-31 odd,39,41,45,61,63,65,69,75
12	Non-Linear Systems	Chapter 9, Section 9.4, pages 784-788	p.790: 23-37 odd,49
13	Adding and Subtracting Rational Expressions Multiplying and Dividing Rational Expressions	5.1 (Ex. 3, 4, 6) Rational Expression (pp. 422-428) 5.2 (Ex. 1-3) Multiplication of Rational Expression (pp. 432-434) 5.3 (Ex. 1-9) Addition & Subtraction of Rational Expressions (pp. 437-444) Chapter 5, Section 5.3, pages 437-444	p. 430: 31-39 odd, 43, 48, 65-73 odd p. 435: 11-21 odd, 23-31 odd p. 445: 7-11 odd, 33-45 odd, 49-57 odd, 81 (G),83 (G) p.445: 7-23, 27-49 odd
14	Complex Fractions	Chapter 5, Section 5.4, pages 447-452	p.452: 9-15,17-23 odd, 31,33
15	Solving Fractional Equations	5.5 (Ex. 1-5) Solving Rational Equations (pp. 454-459) Chapter 5, Section 5.5 pages 454-460	p. 460: 9-19 odd, 29-37 odd p.460: 9-33 odd
16	Exponent Properties Negative Exponents (and Scientific Notation?)	4.1 (Ex. 1-3) Properties of Integer Exponents and Scientific Notation (pp. 320-322) 4.1 (Ex. 4-7) Properties of Integer Exponents and Scientific Notation (pp. 323-326) Chapter 4, Section 4.1, pages 320-324	p. 327: 11-17 odd, 25-31 odd, 33-55 odd, 61, 63 p. 327: 65, 69-83 odd, 85-90 all, 91-103 odd p.327: 11-29 odd,33,35,41,47,63,67,75
17	Radicals (incl. nth roots) Rational Exponents	6.1 (Ex. 1-3) Definition of an nth Root (pp. 496-498) Chapter 6, Section 6.1, pages 496-502 Chapter 6, Section 6.2, pages 508-512	p. 504: 7-15 odd 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
18	Simplifying Radical Expressions Addition and Subtraction of Radical Expressions	6.3 (Ex. 1, 3, 4, 6 7 -- only examples with square roots) Simplifying Radical Expressions (pp. 515-519) 6.4 (Ex. 1-4 -- only examples with square roots) Addition and Subtraction of Radicals (pp. 522-525) Chapter 6, Section 6.3, pages 515-519 Chapter 6, Section 6.4, pages 522-525	p. 520: 9, 13, 17, 19, 21, 25, 33, 35, 37, 45, 47, 49, 53, 55, 63, 67, 69, 71, 77 (G), 79 (G) p. 526: 15, 19, 23, 35, 37, 39, 41, 45, 51, 55, 57, 81 (G), 83 (G) 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
19	Multiplying and Dividing Radical Expressions	6.5 (Ex. 1-7 -- only examples with square roots) Multiplication of Radicals (pp. 528-532) Chapter 6, Section 6.5, pages 528-532	p. 534: 11, 17, 19, 21, 23, 29, 31, 35, 37, 41, 45, 47, 51, 55, 57, 61, 63, 77, 85 (G), 87 (G) p.534: 11,17,19,21,23,25,29,31,35,37,55,57,61,63,67,77,79,87
20	Operations on Complex Numbers and Rationalization	6.6 (Ex. 1, 3, 5, 7-9 -- only examples with square roots) Division of Radicals and Rationalization (pp. 536-543) Chapter 6, Section 6.6, pages 536-543 (skip examples 4 and 6)	p. 544: 11, 13, 17, 31-39 odd, 53, 63, 65, 67, 75-81 odd p.544: 11,13,17,21,31,35,39,53,57,63,67,71,77,81
21	Solving Radical Equations	6.7 (Ex. 1, 4) Solving Radical Equations (pp. 546-549) Chapter 6, Section 6.7, pages 546-549	p. 554: 11-19 odd, 25, 27, 41-46 all, 67,68 p.554: 13-18,25-28,41-46
22	Angles in Degrees	Chapter 1, Section 1.1, pages 2-6	P 7: 7,8,35-43 odd

	Similar Triangles and Proportions	Chapter 2, Section 2.1, pages 46-50	p.51: 7-21 odd
23	Special Triangles	Chapter 1, Section 1.1, pages 2-6	p.7: 45-57 odd
24	Trigonometric Ratios of Right Triangles	Chapter 2, Section 2.2, pages 54-56	p.57: 7-23 odd
25	Inverse Trigonometric Functions	Chapter 2, Section 2.2, pages 54-56	P 57: 35-42
26	Solving Right Triangles Applications	Chapter 2, Section 2.3, pages 63-66	p.69: 7-17 odd, 27, 29, 31, 35-38
27	Angles in Radians Coordinate Plane Trigonometry	Chapter 3, Section 3.1, pages 90-93 Chapter 1, Section 1.3, pages 22-27	p.95: 25-39 odd, 43,45,49-61 odd,67-71 odd p.28: 25-31 odd, 45,47,55-63 odd,64,73-79 odd
28	Unit Circle	Chapter 3, Section 3.3, pages 108-113	p.115: 29-35 odd,37-40
29	Graphs of Sine and Cosine	Chapter 4, Section 4.1, pages 134-144 Chapter 4, Section 4.2, pages 153-159	p.145: 1-3,17-29 odd,33-39 odd p.160: 15,19,21,39,43,47
30	Fundamental Identities Proving Trig Tautologies	Chapter 1, Section 1.4, pages 31-35 Chapter 5, Section 5.1, pages 212-214	p.35: 11-37 odd p.216: 13-29 odd,37,43,51
31	Solving Trigonometric Equations	Chapter 6, Section 6.3, pages 284-290	p.292: 13,17,21,25,31,35,43-49 odd,79,80
32	Law of Sines	Chapter 7, Section 7.1, pages 316-322	p.324: 7-23 odd
33	Law of Cosines	Chapter 7, Section 7.2, pages 329-332	p.338: 7-11 odd, 21-29 odd
34	Exponential Functions	Chapter 8, Subsections 8.3.1, 8.3.2, 8.3.4., pages 680-686	p.687: 9-25 odd,43,49
35	Logarithmic Functions	Chapter 8, Section 8.4, pages 690-693 and examples 8, 9	p.699: 11-61 odd
36	Properties of Logarithms	Chapter 8, Section 8.5, pages 704-709 Chapter 8, Section 8.6, pages 712-715 (omit example 3).	p.710: 17-29 odd, 45-55 odd, 63-64,67-71,79,81,91 p.721: 11,13
37	Exponential Equations Applications to Compound Interest, Population Growth	Chapter 8, Section 8.7, pages 726-734	p.735: 39-49 odd,55-61 odd,73,75,77,79,87