**NEW YORK CITY COLLEGE OF TECHNOLOGY**

**The City University of New York**

**DEPARTMENT:** Mathematics

**COURSE:** MAT 065 (or MAT 065+)

**TITLE:** Elementary Algebra with Basic Mathematics Review

**DESCRIPTION:** Fundamentals of elementary algebra with an integrated review and reinforcement of arithmetic skills. Topics include the real number system, numerical evaluation, algebraic operations, algebraic and graphical solutions of two variable linear equations, word problems, algebraic fractions, quadratic equations and the Pythagorean Theorem.

**REQUIRED HOMEWORK** Knewton-Alta**/**Webwork (determined by instructor)

**Open Source Resources:** Available on the Mathematics Department

Arithmetic/AlgebraEdition 3 by Bonamome, Carley, ElHitti, Tradler,Zhou

GPS for MAT 0650 –A Workbook of Problems for College Algebraby Greenstein

**CREDITS:** 5 class hours 0 credits (or 5 class hours + PLTL session 0 credits)

**PREREQUISITE:** University Placement Criteria

**CALCULAORS:**  The use of four function and Scientific Calculators are permitted after the midterm.

No graphing calculators or cell phone calculators.

**Grading Policy for Developmental Math**

**S** – Satisfactory – student successfully completes and passes the course if the student has

BOTH

a. A Course Average ≥ 70,  **AND**

b. Departmental Final Grade ≥ 56

There are two possible NON PASSING grades.

R – Repeat – student, in **good attendance** (lateness/attendance policy described below).

**WU** – unofficial withdrawal – student, with excessive absences.

Students in developmental math **do not** have the option to officially withdraw from the course.

**Eligibility for Free Intercession or Summer Course**

Only students with an R grade are eligible to register for a free (MAT0650, 0650+) course.

Students failing with a WU grade are not eligible for any free courses.

**R** and **WU** grades in non-credit developmental courses do not count in the GPA,

**But** students are given only two attempts to pass the course before they are dismissed from the College. (The Free course does not count as an attempt)

**Developmental Mathematics Department Academic Statement and Policy on Lateness/Absence**

It is crucial for students to attend and participate fully in every class, whether it’s lecture, computer lab, individual work, group work, or exams. Absences and lateness of any kind, excused or unexcused, are discouraged. They disrupt learning and cause work to fall behind. To encourage good attendance practice, the math department implements an attendance policy which allows for absences of no more than 15% of the total number of class meeting sessions.  Absences exceeding 15% will be considered excessive.  A lateness is marked when a student misses 15 minutes of instructional time for that session, by arriving late, leaving early, or taking an unofficial break in-between.  Each lateness is equivalent to ½ and absence.

**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 respondingvigilantly 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

**Course Intended Learning Outcomes/Assessment Methods**

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| **Learning Outcomes** | **Assessment Methods** |
| **1.** Evaluate numerical and algebraic expressions, formulas, and  equations involving rational numbers in integer, fractional, and decimal form. | **1.** Classroom activities and discussion, homework,  exams. |
| **2.** Perform operations with and simplify polynomial, rational,  and radical expressions. | **2.** Classroom activities and discussion, homework,  exams. |
| **3.** Solve one variable linear and factorable quadratic equations. | **3.** Classroom activities and discussion, homework,  exams. |
| **4.** Find and graph solutions to two variable linear equations | **4.** Classroom activities and discussion, homework,  exams. |
| **5.** Derive a two variable linear equation given the slope and y-  intercept, the slope and a point, or two points on its line graph. | **5**. Classroom activities and discussion, homework,  exams. |
| **6.** Solve systems of two variable equations algebraically. | **6**. Classroom activities and discussion, homework,  exams. |
| **7.** Students will be able to apply their knowledge of algebra to  solve verbal problems including profit and loss, ratios and proportions, percent, time-rate-distance, and the Pythagorean Theorem. | **7**. Classroom activities and discussion, homework,  exams. |

**General Education Learning Outcomes/Assessment Methods**

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| **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. |

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| Syllabus MAT 0650 | | **Practice Exercises using Knewton ALTA** | **E -book** |
| **Lesson/date** | **Topics** | Due dates found on the Knewton website | **Chapters: sections in**  **Arithmetic/Algebra e-book**: | |
| 1 | Introduction to Requirements/ Policies &  Sign Numbers | Practice **-1**  Addition/Subtraction of sign Numbers  Practice **-2**  Multiplication/Divison of Sign Numbers | Chapter 1:1 - 5 | |
| 2 | Order of Operations &  Evaluating Expressions | Practice **-3**  Exponents & Order of Operations  Practice **– 4 a**  Evaluating Expressions  Practice – **4b** Evaluation Rational Expressions- | Chapter 1:  6 -9, 10 a- d  Chapter 4:  1, 3 - 7 | |
| 3 | Combining Like Terms Adding /Subtracting Polynomials | Practice **-5**  Combining Like Terms – Addition and Subtraction of Polynomials | Chapter 7:1 - 3  Chapter 8: 1 - 3 | |
| 4 | Properties of Positive Exponents/ &  Multiplying Monomials | Practice **-6**  Product/Quotient Properties of Positive Exponents | Chapter 5: 1 – 6, 9a, 10a | |
| 5 | Multiplying all types of Polynomials | Practice **-7**  Multiplying Monomials, Binomials and Polynomials | Chapter 9: 1-4,6 | |
| 6 | Division of Polynomials & Review Polynomial Operations | Practice **-8**  Dividing Polynomials  **Review for Exam 1** | Chapter 10: 1, 2 | |
| 7 | **Exam 1** & Checking Solutions of First-Degree Equations | **EXAM 1**  Practice **-9**  Check solution in First Degree Equations | Chapter 15: 1- 5 | |
| 8 | Solving First Degree Equations | Practice **-10**  Solving Basic Linear Equations  Solving First Degree Equations with Parentheses | Chapter 16: 1, 2 | |
| 9 | Solving Rational Equations | Practice **-12**  Solving Rational Equations | Chapter 17:  9, 10 | |
| 10 | Solving Literal Equations | Practice **-13**  Solving Literal Equations | Chapter 19:  1- 11 | |
| 11 | Solving Inequalities | Practice **-14**  The number line & interval notation  Practice **-15** Solving Linear Inequalities  **Review for Exam 2** | Chapter 21: 1 | |
| 12 | **Exam 2** & Verbal Problems types: Number & Proportion | **Exam 2**  Practice **-16**  Verbal problems- number & proportions | Chapter 18: 1, 4, 5 | |
| 13 | Verbal Problems types: Distance & Percent (optional) | Practice **-17** Distance Problems  Practice **-18** Percent problems | Chapter 18: 6, 7, 9, 10 | |
| 14 | Greatest Common Factor & Factoring by Grouping | Practice **– 19** Finding the GCF  Practice **-20** Factoring by Grouping | Chapter 12: 1- 5 | |
| 15 | Factoring -Difference of Perfect Squares – include GCF | Practice **-21** Factoring the Difference of Perfect Squares (w/Fa GCF) | Chapter 13:1, 2a-g | |
| 16 | Trinomial Factoring a = 1 and not = 1 | Practice **-22** Factoring Trinomials a=1 | Chapter 14: 1,2 | |
| 17 | Factorng Trinomials a not equal 1  Review Factoring Methods | Practice **-23** Factoring Trinomials a not = 1  Practice **-24** Review Factoring Methods  **Review for Exam 3** | Chapter 14: 3- d | |
| 18 | **Exam 3 &** Solving Quadratic Equations | **Exam 3** Practice **-25** Solve Quadratic Equations by Factoring | Chapter 20:1,  2a -b | |
| 19 | Graphing Lines & Determining the slope and y-int. | Practice **-26** Plotting pts, drawing Hor. & Ver. lines Finding intercepts  Practice **-27** Slope: formula, use to graph & identify | Chapter 25:2 - 5  Chapter 26: 3- 7 | |
| 20 | Writing the Equation of a line passing through two give n points | Practice **-28** Write Equation of a line a point and slope given  Practice **-29** Write the equation of a line given two points | Chapter 26: 10- 14 | |
| 21 | Solving a system of Linear Equations – Graphically & Algebraically | Practice **-30** Solving a System of Linear Equations Graphically  Practice **-31** Solve a System of Linear Equations by Substitution  Practice **-32** Solve a System of Linear Equations by Elimination | Chapter 27: 1 - 3  Chapter 28: 2 | |
| 22 | Simplifying a Rational Expression by Factoring | Practice **-33\*** Simplifying Rational Expressions by Factoring  **Review for Exam 4** | Chapter 22: 1 | |
| 23 | **Exam 4** & Multiplying & Dividing Rational Expressions | **Exam 4**  Practice **-34** Multiplying & Dividing Numerical Fractions  Practice **-35\*** Multiplying & Dividing Rational Expressions | Chapter 22: 2,  3a-d, 4 | |
| 24 | Combining Rational Expressions | Practice **-36** Combining Fractions  Practice **-37 \***Combining Rational Expressions | Chapter 23: 1, 2 | |
| 25 | Simplifying and Combining Square Roots & the  Pythagorean Theorem | Practice **-38** Simplifying and Combining Square Roots  Practice **-39** Pythagorean Theorem | Chapter 11: 1a - g, 2, 4 | |
| 26 | Multiply & Divide Square Roots (no rationalizing the denominator) | Practice **-40** (a) & (b)\* Multiplying & Divide Square Roots  **Review for Exam 5** | Chapter 11: 6 – 8, 10, 11a – f, 12  Chapter 20:3 - 5 | |
| 27 | **Exam 5**/ Review | **Exam 5**  Examples from:1R, 2R | Examples from  1R, 2R | |
| 28 | Review | 3R | 3R | |
| 29 | Review |  |  | |
| 30 | Final Exam |  |  | |

\* Are labeled quizzes but are custom homework assignments containing problems not available in the Knewton.

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| Syllabus MAT 0650 | | **Practice Exercises using Knewton ALTA** | **Practice Exercises**  **using GPS** | **Practice Exercises using e-book** | |
| **Lesson** | **Topics** | Due dates found on the Knewton website | Sections in **GPS** | **Chapters: sections in**  **Arithmetic/Algebra e-book**: |
| 1 | Introduction to Requirements/ Policies &  Sign Numbers | Practice **-1**  Addition/Subtraction of sign Numbers  Practice **-2**  Multiplication/Divison of Sign Numbers | Sections:1.1 & 2.1  1.1: 1 – 23 odd  2.1: 3-13 odd, 17 -23 odd, 33, 39, 43, 51 | Chapter 1:1 - 5 |
| 2 | Order of Operations &  Evaluating Expressions | Practice **-3**  Exponents & Order of Operations  Practice **– 4 a**  Evaluating Expressions  Practice – **4b** Evaluation Rational Expressions- | Sections:2.2 & 3.1  2.2 :1 – 39 odd &  3.1: 1 – 21 odd | Chapter 1:  6 -9, 10 a- d  Chapter 4:  1, 3 - 7 |
| 3 | Combining Like Terms Adding /Subtracting Polynomials | Practice **-5**  Combining Like Terms – Addition and Subtraction of Polynomials | Section 5.1  5.1: 1 -3, 8 -10, 15,16, 22, 25 | Chapter 7:1 - 3  Chapter 8: 1 - 3 |
| 4 | Properties of Positive Exponents/ &  Multiplying Monomials | Practice **-6**  Product/Quotient Properties of Positive Exponents | Sections 1.2, 4.1 & 5.1  1.2: 5 -29 odd  4.1:1 -31odd  5.1: 5,7, 11, 13, 17 -35odd | Chapter 5: 1 – 6, 9a, 10a |
| 5 | Multiplying all types of Polynomials | Practice **-7**  Multiplying Monomials, Binomials and Polynomials | Sections 4.2- 4.4  4.2: 1 – 15 odd  4.3:1,3, 9-15 odd,19 -25 odd,29, 30  4.4: 1 – 9 odd | Chapter 9: 1-4,6 |
| 6 | Division of Polynomials & Review Polynomial Operations | Practice **-8**  Dividing Polynomials  **Review for Exam 1** | Section 8.1  1 – 15 odd, 31 | Chapter 10: 1, 2 |
| 7 | **Exam 1** & Checking Solutions of First-Degree Equations | **EXAM 1**  Practice **-9**  Check solution in First Degree Equations | Section 7.1  1 – 11 odd 15, 17 | Chapter 15: 1- 5 |
| 8 | Solving First Degree Equations | Practice **-10**  Solving Basic Linear Equations  Practice - **11**  Solving First Degree Equations with Parentheses | Section 7.2  1 -31 odd  (Optional 7.3 ex 1 -15 odd) | Chapter 16: 1, 2 |
| 9 | Solving Rational Equations | Practice **-12**  Solving Rational Equations | Section7.4  1 – 3 odd, 18, 21, 23 | Chapter 17:  9, 10 |
| 10 | Solving Literal Equations | Practice **-13**  Solving Literal Equations | Section 7.5  1 –27 odd, | Chapter 19:  1- 11 |
| 11 | Solving Inequalities | Practice **-14**  The number line & interval notation  Practice **-15** Solving Linear Inequalities  **Review for Exam 2** | Section 7.7  1- 7 odd, 13, 19, 23 -29 odd, 37, 39 | Chapter 21: 1 |
| 12 | **Exam 2** & Verbal Problems types: Number & Proportion | **Exam 2**  Practice **-16**  Verbal problems- number & proportions | Sections  2.1: 1 -9odd  12.3: 1 -13 odd | Chapter 18: 1, 4, 5 |
| 13 | Verbal Problems types: Distance & Percent (optional) | Practice **-17** Distance Problems  Practice **-18** Percent problems | Section:12.4: 3 – 7 all & Section 12.2) | Chapter 18: 6, 7, 9, 10 |
| 14 | Greatest Common Factor & Factoring by Grouping | Practice **– 19** Finding the GCF  Practice **-20** Factoring by Grouping | Sections  6.1: 1-17 odd 6.2: 1 – 23odd  6.8: 1 -21 odd | Chapter 12: 1- 5 |
| 15 | Factoring -Difference of Perfect Squares – include GCF | Practice **-21** Factoring the Difference of Perfect Squares (w/Fa GCF) | Sections 6.3 & 6.4  6.3:1 -17 odd, 21 25  6.4: 1 -13 odd, 25,29 | Chapter 13:1, 2a-g |
| 16 | Trinomial Factoring a = 1 and not = 1 | Practice **-22** Factoring Trinomials a=1 | Sections 6.5 & 6.6  6.5: 1-21 odd 6.6: 1 -17 odd | Chapter 14: 1,2 |
| 17 | Factorng Trinomials a not equal 1  Review Factoring Methods | Practice **-23** Factoring Trinomials a not = 1  Practice **-24** Review Factoring Methods  **Review for Exam 3** | Sections 6.7 & 6.9  6.7: 1- 15 odd  6.9: 1-33 odd | Chapter 14: 3- d |
| 18 | **Exam 3 &** Solving Quadratic Equations | **Exam 3** Practice **-25** Solve Quadratic Equations by Factoring | Section 7.6  1-5 odd, 11 -29 odd | Chapter 20:1,  2a -b |
| 19 | Graphing Lines & Determining the slope and y-int. | Practice **-26** Plotting pts, drawing Hor. & Ver. lines Finding intercepts  Practice **-27** Slope: formula, use to graph & identify | Sections 10.1 & 10.4  10.1: 1-5 odd, 15, 17 & 19  10.4: 1 – 15 odd | Chapter 25:2 - 5  Chapter 26: 3- 7 |
| 20 | Writing the Equation of a line passing through two give n points | Practice **-28** Write Equation of a line a point and slope given  Practice **-29** Write the equation of a line given two points | Section 10.4  1 – 35 odd | Chapter 26: 10- 14 |
| 21 | Solving a system of Linear Equations – Graphically & Algebraically | Practice **-30** Solving a System of Linear Equations Graphically  Practice **-31** Solve a System of Linear Equations by Substitution  Practice **-32** Solve a System of Linear Equations by Elimination | Sections:  11.1, 11.2 & 11.3 | Chapter 27: 1 - 3  Chapter 28: 2 |
| 22 | Simplifying a Rational Expression by Factoring | Practice **-33\*** Simplifying Rational Expressions by Factoring  **Review for Exam 4** | Section:  8.1 ex. 17 – 32 all | Chapter 22: 1 |
| 23 | **Exam 4** & Multiplying & Dividing Rational Expressions | **Exam 4**  Practice **-34** Multiplying & Dividing Fraction  Practice **-35\*** Multiplying & Dividing Rational Fractions | Sections:  8.2 & 8.3 | Chapter 22: 2,  3a-d, 4 |
| 24 | Combining Rational Expressions | Practice **-36** Combining Fractions  Practice **-37\*** Combining Rational Expressions | Section:  8.4 | Chapter 23: 1, 2 |
| 25 | Simplifying and Combining Square Roots & the  Pythagorean Theorem | Practice **-38** Simplifying and Combining Square Roots  Practice **-39** Pythagorean Theorem | Sections:  9.2 and 9.5 | Chapter 11: 1a - g, 2, 4 |
| 26 | Multiply & Divide Square Roots (no rationalizing the denominator) | Practice **-40** (a) & (b)\* Multiplying & Divide Square Roots  **Review for Exam 5** | 4Sections:  9.3, 9.4 and 9.1 | Chapter 11: 6 – 8, 10, 11a – f, 12  Chapter 20:3 - 5 |
| 27 | **Exam 5**/ Review | **Exam 5**  Examples from:1R, 2R | Examples from  1R, 2R | Examples from  1R, 2R |
| 28 | Review | 3R | 3R | 3R |
| 29 | Review |  |  |  |
| 30 | Final Exam |  |  |  |

\* Are assignments designated at a Quiz -custom questions only.