

**Metropolitan State University**  
**College of Sciences**  
**MATH 098-01 Introduction to Mathematical Thinking**

**Term:** Summer 2017  
**Meeting:** Mondays 6—9:50 pm  
**Instructor:** Dr. Pangyen (Ben) Weng, Associate Professor of Mathematics  
**Email:** Pangyen.Weng@metrostate.edu  
**URL:** [www.drweng.net](http://www.drweng.net)

**Course Description:** This course prepares students for college-level mathematics. Within a comprehensive conceptual framework, it refreshes students on fundamental arithmetic, and focuses on the numerical, algebraic, geometric and verbal representations of functions and algebraic equations. Important topics of this course include rates of change, linear equations and functions, exponential and logarithmic functions and equations, quadratic equations and functions, and their applications.

**Learning Outcomes:**

1. Demonstrate proficiency in basic arithmetic calculations and algebraic derivations, at the prerequisite level of College Algebra.
2. Understand the concepts of functions and algebraic equations.
3. Demonstrate sufficient understanding of linear, exponential, logarithmic, and quadratic functions, and their applications.
4. Understand the concepts of algebraic equations and functions in the aspects of their numerical, algebraic, geometric and verbal representations.

**Words from the instructor:** This class aims at (1) developing your problem-solving ability, (2) helping you build a good learning/studying practice and (3) strengthening your algebra skills. To accomplish these goals, you need to attend all classes, do all the homework, work with the instructor and tutors, participate group work with classmates. You also need to invest in a great deal of time and effort, and study both hard and smart. Expect to spend 8 to 10 hours each week on this course. Your growth in this class will set up for future success not only in your next math course but in your college career.

**Prerequisite:** Placement by the University's Placement and Assessment Services is required.

**MyMathLab (MML):** You are required to have access to MML online learning system. You can purchase *Student Access Kit to MyMathLab* online. To sign up for the online learning system, go to:

- URL: <http://www.MyMathLab.com>
- Course ID *weng34354*

**Textbook.** The e-text of the book can be viewed on MML. You are NOT required to have the book in print. The textbook adopted for the MML learning system is

- *Beginning & Intermediate Algebra, 5th Edition* by Tobey, Slater, Blair and Crawford
- ISBN13: 9780321780539.

**Technology:** Calculators are NOT required. Computing or graphing devices (computer programs, tablets or cellphones with apps, etc.) are welcome for use in learning, studying or doing homework. They also might be allowed in some parts of module assessments.

**Notes and attendance:** Attendance and notes are checked at the beginning of every class: 1 point for signing in, 1 point for signing out, and 2 points for guided notes. Notes need to be taken on the worksheets that accompany the assigned video lessons.

**Check-in assignments:** These are online assignments due before the class. No makeup is allowed.

**Discussions and group quizzes:** The majority of the class time is on group work and group quizzes. No makeup is allowed for missing group quizzes.

**Homework:** Online assignments due **3 days after each class**. You will do a check-out quiz (not counted for grades) to clear the problems you already mastered. No late homework is accepted.

**Module tests:** There are tests for each of the 6 modules. The passing score of each assessment is 70 or above. Unless the instructor has been contacted and provided with legitimate reasons, students who are absent from an exam will receive a score of 0. Students who fail any of the first 5 assessments must make up the test for 70% of the full credit. Students must have a passing assessment to be eligible for the next assessment.

**Grading policy:** Letter grades are given based on the following scale. You will receive the best grade that meets all the requirements. Students who are NOT eligible for any of the 4 grades automatically receive an F.

	I	C	B	A
<b>Homework</b>	≥ 70%	≥ 70%	≥ 80%	≥ 90%
<b>Check-in</b>	≥ 70%	≥ 70%	≥ 80%	≥ 85%
<b>Notes and attendance</b>	≥ 70%	≥ 70%	≥ 80%	≥ 80%
<b>Group quiz</b>	≥ 70%	≥ 70%	≥ 80%	≥ 80%
<b>Module assessments</b>	-	≥ 70%	≥ 80%	≥ 85%

**Testing Center:** Phone: 651-793-1460; email: [testing.center@metrostate.edu](mailto:testing.center@metrostate.edu)

**Students with disabilities:** Special accommodations can often be made for those with learning disabilities. Students who have or may have documented learning disabilities are recommended to contact the instructor as well as the Disability Services Office at (651) 793-1540 or (651) 772-7687.

**Email communication:** In accordance with University's policy, this class will use your university email address (name@metrostate.edu) to communicate with you about all course-related matters.

**Policy on academic integrity:** The Metropolitan State University Student Handbook states “*In simple terms, plagiarism is using another person's words or ideas and presenting them as your own, without acknowledging the original source. This is a serious academic offense. Academic sanctions can include receiving a failing grade for an assignment or an entire course.*”

Assignments and exams are to be completed independently unless specified otherwise. Copying and/or utilizing another person's work in order to complete your assignments or exams constitutes plagiarism. In situations where I suspect academic dishonesty, I reserve the right to either reassess your understanding of the material or assign a grade of 0 points. Repeated offenses will result in a grade of F for the entire course. For additional information on the university's policies regarding plagiarism, please refer to the student handbook found at <http://www.metrostate.edu/msweb/pathway/gateway/handbook/handbook.html>.

**Classroom diversity:** The instructor strives to provide a welcoming learning environment to students of diverse backgrounds with diverse learning needs. Students who have questions or concerns about the course policy or how the course is conducted are encouraged to discuss them with the instructor.

**Tentative Schedule:**

<b>Class</b>	<b>Date</b>	<b>Content and Activities</b>	<b>Textbook coverage</b>
1	5/15	<b>Module 1 Arithmetic Skills</b> Topic 1. Simplifying Fractions Topic 2. Adding, Subtracting, Multiplying and Dividing Fractions Topic 3. Decimals and Percents	0.1 0.2, 0.3 0.4, 0.5
2	5/22	Topic 4. Using Negative Numbers Part A: Addition and Subtraction Topic 5. Using Negative Numbers Part B: Multiplication and Division Topic 6. Solving Real Life Problems	1.1, 1.2 1.3 0.6
-	5/29	<b>Memorial Day: no class</b>	
3	6/5	<b>6—7 pm: Module 1 Test</b> <b>Module 2 Working with Variables</b> Topic 7. Using Exponents Topic 8. The Order of Operations Topic 9. The Distributive Property Topic 10. Combining Like Terms	1.4 1.5 1.6 1.7
4	6/12	Topic 11. Evaluating Algebraic Expressions and Formulas Topic 12. Grouping Symbols Topic 13. Principles of Equality Topic 14. Basic Linear Equations	1.8 1.9 2.1, 2.2 2.3
5	6/19	<b>No class meeting; online learning only.</b> <b>Module 2 Test is online and due at 7 pm, 6/19.</b> <b>Module 3 Linear Problems</b> Topic 15. More Tool-Building: Equations with Fractions Topic 16. Modeling Real-Life Problems Using Equations	2.4 2.5
6	6/26	Topic 17. Word Problems Topic 18. Inequalities in One Variable Topic 19. More Word Problems	2.6 2.8 2.7
7	7/3	<b>6—7 pm: Module 3 Test</b> <b>Module 4 Functions and Graphs</b> Topic 20. The Rectangular Coordinate System Topic 21. Graphing Linear Equations Topic 22. The Slope of a Line	3.1 3.2. 3.3
8	7/10	Topic 23. Writing the Equation of a Line Topic 24. Functions Topic 25. Applications of Functions and Graphs	3.4 3.6 TBD
9	7/17	<b>6—7 pm: Module 4 Test</b> <b>Module 5 Quadratic Equations and Functions</b> Topic 26. Quadratic Equations Topic 27. Solving Quadratic Equations by Formula	9.1 9.2
10	7/24	Topic 28. Quadratic Forms Topic 29. Quadratic Functions and Their Graphs Topic 30. Applications of Quadratics	9.3 9.6 9.4
11	7/31	<b>6—7 pm: Module 5 Test</b> <b>Module 6 Exponential and Logarithm</b> Topic 31. More about Functions Topic 32. The Exponential Function Topic 33. The Logarithmic Function	11.1, 11.2 12.1 12.2
12	8/7	Topic 34. Change of Base of Logarithms Topic 35. Exponential and Logarithmic Equations Topic 36. Applications of Exponential and Log	12.4 12.5 TBD
13	8/14	<b>Module 6 Test</b>	

## Complete list of topics:

### Module 1 Arithmetic Skills

- 1 Simplifying Fractions
- 2 Adding, Subtracting, Multiplying and Dividing Fractions
- 3 Decimals and Percents
- 4 Using Negative Numbers Part A: Addition and Subtraction
- 5 Using Negative Numbers Part B: Multiplication and Division
- 6 Solving Real Life Problems

### Module 2 Working with Variables

- 7 Using Exponents
- 8 The Order of Operations
- 9 The Distributive Property
- 10 Combining Like Terms
- 11 Evaluating Algebraic Expressions and Formulas
- 12 Grouping Symbols
- 13 Principles of Equality
- 14 Basic Linear Equations

### Module 3 Linear Problems

- 15 More Tool-Building: Equations with Fractions
- 16 Modeling Real-Life Problems Using Equations
- 17 Word Problems
- 18 Inequalities in One Variable
- 19 More Word Problems

### Module 4 Functions and Graphs

- 20 The Rectangular Coordinate System
- 21 Graphing Linear Equations
- 22 The Slope of a Line
- 23 Writing the Equation of a Line
- 24 Functions
- 25 Applications of Functions and Graphs

### Module 5 Quadratic Equations and Functions

- 26 Quadratic Equations
- 27 Solving Quadratic Equations by Formula
- 28 Quadratic Forms
- 29 Quadratic Functions and Their Graphs
- 30 Applications of Quadratics

### Module 6 Exponential and Logarithm

- 31 More about Functions
- 32 The Exponential Function
- 33 The Logarithmic Function
- 34 Change of Base of Logarithms
- 35 Exponential and Logarithmic Equations
- 36 Applications of Exponential and Log