

# MATH 4

## Intermediate Algebra

- I. Course Description:** MATH 4 expands upon the topics of Algebra I including rational expressions, radicals and exponents, quadratic equations, systems of equations, and applications. It develops the mathematics proficiency necessary for selected curriculum entrance. Credits not applicable towards graduation. Lecture 5 hours per week.
- II. Prerequisites:** You must make a satisfactory score on an appropriate proficiency examination and you must have completed MATH 3 or its equivalent.
- III. Grade:**  
**S = Satisfactory (75% or more)**  
**R = Repeat (progress in course but grade less than 75%)**  
**U = Unsatisfactory (no or very little progress)**
- IV. Instructional Materials:**  
Textbook: Intermediate Algebra by Miller, O'Neill and Hyde (second edition)  
A scientific calculator or graphing calculator is required.
- V. Overall Objectives:**
1. Simplify algebraic expressions using the order of operations.
  2. Perform operations using exponents.
  3. Understand scientific notation.
  3. Solve linear equations and inequalities, including application problems and absolute value problems.
  4. Understand functions, function notation, and the algebra of functions.
  5. Graph linear functions, find the slope of a line, and find the equation of a line.
  6. Solve systems of equations with 2 or 3 unknowns.
  7. Perform algebraic operations on polynomials including factoring.
  8. Solve polynomial equations by factoring, completing the square, extracting square roots, and by the quadratic formula.
  9. Perform algebraic operations on rational expressions.
  10. Solve rational equations.
  11. Simplify radicals and perform algebra operations using complex numbers.
  12. Understand exponential and logarithmic functions.
- VI. Attendance:** It is expected that you will attend every class session. You are responsible for the material covered, if you should miss class. If your absences exceed 20% of the class sessions, your Instructor has the authority to withdraw you from the class. Please keep your Instructor informed when you must miss class.
- VII. Supplemental Materials:** Videotapes and software covering each section and keyed to this textbook, review problem-solving methods and guide students through practice problems. Videotapes are available in the Learning Lab and Math Lab. Tutorial software is also available in the Math Lab (Rm. 225).
- VIII. Disability Services Policy:** Reasonable accommodations will be made for students with disabilities provided those students have registered with the Office of Disability Services. Present your teacher with the documentation.

**TIDEWATER COMMUNITY COLLEGE  
CLASSROOM AND LABORATORY  
EMERGENCY PROCEDURES FOR FACULTY**

**In the event of a bomb threat, tornado, or fire, students and staff may be asked to evacuate the building or move to a secure location within the building. Evacuation routes for movement to an external location or to a shelter within the building are posted at the front of the room. Students should review the maps and make sure that the exit route and assembly location for the building are clearly understood. If you have a disability that may require assistance during an evacuation, please let your faculty know at the end of the first class.**

## **MATH 4: INTERMEDIATE ALGEBRA COURSE OUTLINE**

**Text: Intermediate Algebra (second edition)**

**Author: Miller, O'Neill and Hyde**

### **Chapter One: Review of Basic Algebraic Concepts**

- 1.1 Sets of Numbers and Interval Notation**
- 1.2 Operations on Real Numbers**
- 1.3 Simplifying Expressions**
- 1.4 Linear Equations in One Variable**
- 1.5 Applications of Linear Equations in One Variable**
- 1.6 Linear Equations and Applications to Geometry**
- 1.7 Linear Inequalities in One Variable**

### **Chapter Two: Linear Equations in Two and Three Variables**

- 2.1 Linear Equations in Two Variables**
- 2.2 Slope of a Line**
- 2.3 Equations of a Line**

### **Chapter Ten: Conic Sections**

- 10.1 Midpoint Formula**

### **Chapter Three: Systems of Linear Equations**

- 3.2 Solving Systems of Equations by Using the Substitution Method**
- 3.3 Solving Systems of Equations by Using the Addition Method**
- 3.4 Applications of Systems of Linear Equations in Two Variables**
- 3.5 Systems of Linear Equations in Three Variables and Applications**

### **Chapter Two: Linear Equations in Two Variables and Functions**

- 2.5 Introduction to Relations**
- 2.6 Introduction to Functions**
- 2.7 Graphs of Basic Functions**

### **Chapter Nine: Exponential and Logarithmic Functions**

- 9.1 Algebra of Functions and Composition**

### **Chapter One: Review of Basic Algebraic Concepts**

- 1.8 Properties of Integer Exponents and Scientific Notation**

### **Chapter Four: Polynomials**

- 4.1 Addition and Subtraction of Polynomials and Polynomial Functions**
- 4.2 Multiplication of Polynomials**
- 4.3 Division of Polynomials**

### **Chapter Six: Radicals and Complex Numbers**

- 6.1 Definition of an  $n$ th Root**
- 6.2 Rational Exponents**
- 6.3 Simplifying Radical Expressions**

- 6.4 Addition and Subtraction of Radicals**
- 6.5 Multiplication of Radicals**
- 6.6 Division of Radicals and Rationalization**
- 6.7 Radical Equations**
- 6.8 Complex Numbers**

**Chapter Four: Polynomials**

- 4.4 Greatest Common Factor and Factoring by Grouping**
- 4.5 Factoring Trinomials**
- 4.6 Factoring Binomials**
- 4.8 Solving Equations by Using the Zero Product Rule**

**Chapter Seven: Quadratic Equations and Functions**

- 7.1 Square Root Property and Completing the Square**
- 7.2 Quadratic Formula**
- 7.4 Graphs of Quadratic Functions**
- 7.5 Vertex of a Parabola and Applications**

**Chapter Five: Rational Expressions and Rational Equations**

- 5.1 Rational Expressions and Rational Functions**
- 5.2 Multiplication and Division of Rational Expressions**
- 5.3 Addition and Subtraction of Rational Expressions**
- 5.4 Complex Fractions**
- 5.5 Rational Equations**
- 5.6 Applications of Rational Equations and Proportions**

**Chapter Eight: More Equations and Inequalities**

- 8.3 Absolute Value Equations**
- 8.4 Absolute Value Inequalities**
- 8.5 Linear Inequalities in Two Variables**

**Chapter Nine: Exponential and Logarithmic Functions**

- 9.3 Exponential Functions**
- 9.4 Logarithmic Functions**
- 9.5 Properties of Logarithms**

**MATH 4 SCHEDULE**

Text: Intermediate Algebra by Miller, O'Neill and Hyde (second edition)

<b>Week 1</b> 1.1 1.2 1.3 1.4 1.5	<b>Page</b> 10 24 34 46 56	<b>Suggested HW</b> 11,29,32,52,54,55,71,73,78 7,11,13,19,46,47,77,81,101,103,105 9,11,45,59,63,71,81,85,86 19,29,33,59,62,75,81,87,91,97 5,14,22,29,37,41,55,61,62	<b>Week 8</b> 6.5 6.6 6.7 6.8 Review	<b>Page</b> 469 479 489 499	<b>Suggested HW</b> 11,16,31,35,37,61,63,55,57 27,29,31,39,49,51,67,83,85 11,17,37,39,47,51,60 11,19,23,27,35,53,55,59,61,65,69,77,81
<b>Week 2</b> 1.6 1.7 10.1 2.1	<b>Page</b> 63 74 745 112	<b>Suggested HW</b> 19,21,23,25,33,37,41,51,53,55 18,27,29,32,36,38,60,64,66,70 63,69 15,17,21,23,25,33,49,53	<b>Week 9</b> Test 3 4.4 4.5 4.6 4.8	<b>Page</b> 303 315 324 341	<b>Suggested HW</b> 15,17,23,33,35,47,51,53,57,61 15,17,19,21,25,29,31,33,71,75,87 11,13,33,35,49,51,63 21,25,27,29,33,37,39,43
<b>Week 3</b> 2.2 2.3 Review Test 1	<b>Page</b> 124 137	<b>Suggested HW</b> 7,14,18,22,33,34,47,53 26,28,47,48,54,64,70	<b>Week 10</b> 7.1 7.2 7.4 7.5	<b>Page</b> 522 536 543 565	<b>Suggested HW</b> 2,4,8,11,35,39,43,51 7,14,16,19,20,27,32,56,59,60 11,13,19,21,45,47 17,19,29,31,33,47,48,49
<b>Week 4</b> 3.2 3.3 3.4 3.5	<b>Page</b> 219 226 234 243	<b>Suggested HW</b> 8,16,21,47 5,9,21,29,43 8,11,13,17,24,27,33,35 7,11,12,21	<b>Week 11</b> 5.1 Review Test 4	<b>Page</b> 369	<b>Suggested HW</b> 9,11,13,23,29,36,39,41,47,53
<b>Week 5</b> 2.5 2.6 9.1 2.7	<b>Page</b> 158 169 654 181	<b>Suggested HW</b> 21,25,29 17,19,23,31,32 3,7,15,25,49,50,59 11,12,14,16,45,47,51	<b>Week 12</b> 5.2 5.3 5.4	<b>Page</b> 375 384 392	<b>Suggested HW</b> 11,14,17,19,23,25,29,32,39 7,9,17,19,21,35,37,41,42,47,49,59 13,15,21,23,29,31,35
<b>Week 6</b> 1.8 4.1 Review Test 2 4.2 4.3	<b>Page</b> 84 273 284 294	<b>Suggested HW</b> 41,57,67,69,71,81,87,89,107 5,13,15,17,33,43,47,53 7,9,13,17,29,43,47,49,53,71 12,15,24,27,28,30,32,37	<b>Week 13</b> 5.5 5.6 8.3 8.4	<b>Page</b> 399 409 609 619	<b>Suggested HW</b> 9,11,13,17,23,25,31,35,39,55,59,63 27,31,43,57,61,63,64 17,21,25,29,31,33 9,11,20,23,26,28,30,32,35
<b>Week 7</b> 6.1 6.2 6.3 6.4	<b>Page</b> 441 449 456 461	<b>Suggested HW</b> 9,21,23,25,31,47,57,61,65,75 9,21,25,45,69,71,73,75,79,83 11,13,17,25,35,43,53,57,73,75 15,19,23,29,38,41,47,51,59,61	<b>Week 14</b> 8.5 9.3 9.4 9.5	<b>Page</b> 629 672 683 694	<b>Suggested HW</b> 17,19,21,25,29,31 35,37,49 11,16,24,28,35,38,39,45,46,52,54,59, 63,73,75 45,49,51,65,69,71
			<b>Week 15</b> Review Test 5		