SINCLAIR COMMUNITY COLLEGE
DAYTON, OHIO

DEPARTMENT SYLLABUS FOR COURSE IN

MAT 0300 - ALGEBRA III
(3 CREDIT HOURS)

1.	COURSE DESCRIPTION:	Systems of linear equations in two variables and applied problems; two-variable inequalities and systems of inequalities and applied problems; operations with rational exponents, radical expressions and complex numbers; relations and functions; simplifying radical expressions; solving equations with rational expressions, equations with radical expressions, quadratic equations by factoring, completing the square, and the quadratic formula, equations quadratic in form; quadratic functions. Traditional testing (proctored or in Testing Center) is used in all online sections. Note: Courses that begin with a zero are developmental in nature. Credit earned in developmental courses will not apply to the overall program hours.
2.	COURSE OBJECTIVES:	This course is designed to build upon the concepts of MAT 0100 and MAT 0200 and to introduce further topics that the student will need to continue the study of mathematics.
3.	PREREQUISITE:	Grade of "C" or better in MAT 0200 or sufficient score on Sinclair Community College Mathematics Placement Test.
4.	ASSESSMENT:	In addition to required exams as specified in the syllabus, instructors are encouraged to include other components in computing final course grades such as homework, quizzes, and/or special projects. However, 80% of the student's course grade must be based on in-class proctored exams.
5.	TEXT:	**Introductory and Intermediate Algebra** Fifth Edition by Robert Blitzer Pearson/Prentice Hall; 2017 **MyMathLab** is a required component of this course.
6.	CALCULATOR:	The required calculator for MAT 0300 is the TI-30XIIS. Any calculator may be used on homework, quizzes, and during class but the TI-30XIIS must be used on tests. (The math department can supply this calculator for tests.)
7.	PREPARED BY:	Algebra III Group David Hare – Chair, Richard Uchida, Len Ruth **Effective: Spring Semester 2018**

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CLASS SCHEDULE FOR COURSE IN
MAT 0300 - ALGEBRA III
(3 CREDIT HOURS)

CLASSES MEETING TWO TIMES A WEEK FOR 8 WEEKS

Lecture	Sections	Topics
1	Introduction	Introduction
	4.1	Solving Systems of Linear Equations by Graphing
	4.2	Solving Systems of Linear Equations by Substitution
2	4.3	Solving Systems of Linear Equations by Addition Method
	4.4	Problem Solving Using Systems of Equations
3	9.4	Linear Inequalities in Two Variables
4	8.1	Introduction to Functions
	8.2	Graphs of Functions
5		Catch-up Day
		Review for Exam 1
6		**Exam 1 over 4.1 - 4.4, 9.4, 8.1 - 8.2**
	10.1	Radical Expressions and Functions
7	10.2	Rational Exponents
	10.3	Multiplying and Simplifying Radical Expressions
8	10.4	Adding, Subtracting and Dividing Radical Expressions
	10.5	Multiplying with More Than One Term and Rationalizing Denominators
9	10.6	Radical Equations
10	10.7	Complex Numbers
		Review for Exam 2
11		Catch-up Day
		Exam 2 over 10.1 - 10.7
12	11.1	The Square Root Property and Completing the Square; Distance and Midpoint Formulas
	11.2	The Quadratic Formula
13	11.2	The Quadratic Formula
	11.3	Quadratic Functions and Their Graphs
14	11.3	Quadratic Functions and Their Graphs
	11.4	Equations Quadratic in Form
15	11.4	Equations Quadratic in Form
		Review for the Final Exam
16		**Comprehensive Final Exam***

* In face to face sections and online sections: MAT 0300 will have 10 multiple choice questions on the departmental portion of the final exam. The instructor portion of the final exam (which will consist of material from sections 11.1 - 11.4) will consist of about 20 questions. The instructor portion will count as 2/3 of the final exam score (20% of the course grade) while the departmental portion will count as 1/3 of the final exam score (10% of the course grade.) The final exams in Academy sections will include the 10 multiple choice questions from the department but will also include additional comprehensive questions.

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CLASS SCHEULDE FOR COURSE IN
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CLASSES MEETING THREE TIMES A WEEK

Lecture	Sections	Topics
1	Introduction	Introduction
	4.1	Solving Systems of Linear Equations by Graphing
2	4.2	Solving Systems of Linear Equations by Substitution
	4.3	Solving Systems of Linear Equations by Addition Method
3	4.3	Solving Systems of Linear Equations by Addition Method
	4.4	Problem Solving Using Systems of Equations
4	4.4	Problem Solving Using Systems of Equations
	9.4	Linear Inequalities in Two Variables
5	9.4	Linear Inequalities in Two Variables
6	8.1	Introduction to Functions
	8.2	Graphs of Functions
7	8.2	Graphs of Functions
		Review for Exam 1
8		Catch-up Day
		Exam 1 over 4.1 - 4.4, 9.4, 8.1 - 8.2
9	10.1	Radical Expressions and Functions
10	10.2	Rational Exponents
	10.3	Multiplying and Simplifying Radical Expressions
11	10.3	Multiplying and Simplifying Radical Expressions
	10.4	Adding, Subtracting and Dividing Radical Expressions
12	10.4	Adding, Subtracting and Dividing Radical Expressions
	10.5	Multiplying with More Than One Term and Rationalizing Denominators
13	10.5	Multiplying with More Than One Term and Rationalizing Denominators
	10.6	Radical Equations
14	10.6	Radical Equations
15	10.7	Complex Numbers
16		Catch-up Day
		Review for Exam 2
17		**Exam 2 over 10.1 - 10.7**
	11.1	The Square Root Property and Completing the Square; Distance and Midpoint Formulas
18	11.1	The Square Root Property and Completing the Square; Distance and Midpoint Formulas
	11.2	The Quadratic Formula

19	11.3	Quadratic Functions and Their Graphs
20	11.3	Quadratic Functions and Their Graphs
	11.4	Equations Quadratic in Form
21	11.4	Equations Quadratic in Form
22		Catch-up Day
24		Review for the Final Exam
24		**Comprehensive Final Exam***

*   In face to face sections and online sections: MAT 0300 will have 10 multiple choice questions on the departmental portion of the final exam. The instructor portion of the final exam (which will consist of material from sections 11.1 - 11.4) will consist of about 20 questions. The instructor portion will count as 2/3 of the final exam score (20% of the course grade) while the departmental portion will count as 1/3 of the final exam score (10% of the course grade.) The final exams in Academy sections will include the 10 multiple choice questions from the department but will also include additional comprehensive questions.

TO THE INSTRUCTOR

To ensure consistency, at some minimum level, regarding which formulas students are required to learn in each of its courses, the Mathematics Department has developed the attached list for this course.

Course formulas are those that students are required to learn (and required to demonstrate that they have learned) as the formulas are presented in the course. Requiring students to learn more than those listed is the instructor's option.

Please note that only formulas are listed. Students are also expected to learn definitions, theorems and procedures that will allow them to meet course objectives. If you have questions regarding this matter, please contact your course coordinator.

Please refer to the mathematics department handbook for general policies.

Math 0300 Formulas

Chapter 10

- Principal Square Root of a^2

$$\sqrt{a^2} = |a|$$

    If n is an even positive integer

$$\sqrt[n]{a^n} = |a|$$

    If n is an odd positive integer

$$\sqrt[n]{a^n} = a$$

- Fractional Exponents
  $$(a \geq 0)$$

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

$$a^{\frac{m}{n}} = \left(a^{\frac{1}{n}}\right)^m = \left(a^m\right)^{\frac{1}{n}} = \sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m$$

- Laws of Radicals
  $$(a \geq 0, \ b > 0)$$

$$\sqrt[n]{a}\,\sqrt[n]{b} = \sqrt[n]{ab}$$

$$\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$$

$$\sqrt[kn]{a^{km}} = \sqrt[n]{a^m}$$

- Imaginary Unit $\quad i = \sqrt{-1} \ (i^2 = -1)$

$$\sqrt{-b} = i\sqrt{b}$$

Chapter 11

- Square Root Property

$$x^2 = k \iff x = \sqrt{k} \ \text{ or } \ x = -\sqrt{k}$$

- Pythagorean Theorem

$$a^2 + b^2 = c^2$$

- Distance Formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

- Midpoint Formula

$$\left(\frac{x_1 + x_2}{2}, \ \frac{y_1 + y_2}{2} \right)$$

- Quadratic Formula

If $ax^2 + bx + c = 0$, then $\quad x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad$ ($a \neq 0$)

- Forms of Quadratic Functions

$$f(x) = ax^2 + bx + c$$
$$f(x) = a(x - h)^2 + k, \quad \text{vertex } (h, k)$$

- Line of Symmetry for a Parabola

$$x = \frac{-b}{2a} \quad (a \neq 0)$$

- Vertex Formula

$$\left(\frac{-b}{2a}, f\left(\frac{-b}{2a} \right) \right) \quad (a \neq 0)$$