

SINCLAIR COMMUNITY COLLEGE  
DAYTON, OHIO

DEPARTMENT SYLLABUS FOR COURSE IN  
**MAT 1470 - COLLEGE ALGEBRA**  
(3 SEMESTER HOURS)

1. **COURSE DESCRIPTION:** Polynomial, radical, rational, exponential, and logarithmic functions and their graphs; roots of polynomial functions, rational and polynomial inequalities; systems of linear and nonlinear equations; matrices; and applications.
2. **COURSE OBJECTIVES:** To develop in the student the theories, skills, and techniques that form the foundation for algebra, to provide the student opportunities to apply their knowledge of algebra in a variety of contexts, to build within the student the mathematical sophistication necessary for the study of calculus and other courses/disciplines that require the use of algebra.
3. **PREREQUISITE:** Satisfactory score on Mathematics Placement Test or a grade of "C" or better in either MAT 1370 or MAT 1365.
4. **ASSESSMENT:** In addition to required exams as specified on 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:** **College Algebra and Trigonometry**, Third Edition  
Ratti/McWaters  
Pearson  
**Adopted: Fall 2015**  
  
**MyMathLab** is a required component of this course. It will give students access to the online version of the textbook, as well as a set of homework assignments and quizzes.
6. **CALCULATOR POLICY:** A scientific calculator is required. Graphing calculators are not allowed on exams.
7. **INTERNSHIP:** Please include the following in your syllabus:  
  
Experiencing an internship in your field of study is the best way to begin a career. Companies offer opportunities throughout the year for students to practice what they learned in the classroom to solve real world of work problems. To learn more about internship opportunities and how to connect your skills with a future employer, contact Chad R. Bridgman, M.S.M. Internship Coordinator for Science, Mathematics & Engineering by phone 937-512-2508, office (3-134), or email [Chad.Bridgman@Sinclair.edu](mailto:Chad.Bridgman@Sinclair.edu), and begin test driving your future career today!
7. **PREPARED BY:** Kinga Oliver -point of contact, David Hare, Susan Harris, Craig Birkemeier,



SINCLAIR COMMUNITY COLLEGE  
DAYTON, OHIO

CLASS SCHEDULE FOR COURSE IN  
**MAT 1470 – COLLEGE ALGEBRA**  
(3 SEMESTER HOURS)

**CLASSES MEETING 2 TIMES A WEEK**

Lecture	Sections	Topics
1	2.4	Introduction to the Class Functions
2	2.5	Properties of Functions
3	2.6	A Library of Functions
4	2.7	Transformations of Functions
5		<i>Catch-up / Review / Holiday</i>
6	2.8	Combining Functions; Composite Functions
7	2.9	Inverse Functions
8		<i>Review</i>
9		<b>TEST 1 [ 2.4–2.9]</b>
10	3.1	Quadratic Functions
11	3.1 3.2	Quadratic Functions Polynomial Functions
12	3.2	Polynomial Functions
13	3.3	Dividing Polynomials
14	3.4	The Real Zeros of a Polynomial Function
15	3.5 3.6	Complex Zeros of a Polynomial Function Rational Functions
16	3.6	Rational Functions

**MAT 1470 – College Algebra**

**2 TIMES A WEEK SECTIONS CLASS SCHEDULE (continued)**

Lecture	Sections	Topics
17	1.5*	Inequalities*
18		<i>Review</i>
19		<b>TEST 2 [1.5, 3.1–3.6]</b>
20	4.1	Exponential Functions
21	4.1 4.2	Exponential Functions Logarithmic Functions
22	4.3	Rules of Logarithms
23	4.3 4.4**	Rules of Logarithms Exponential and Logarithmic Equations and Inequalities**
24	4.4**	Exponential and Logarithmic Equations and Inequalities**
25	8.1 8.2	Systems of Linear Equations in Two Variables Systems of Linear Equations in Three Variables
26		<i>Catch-up / Review / Holiday</i>
27		<i>Review</i>
28		<b>TEST 3 [4.1–4.4, 8.1-8.2]</b>
29	8.4 9.1	Systems of Nonlinear Equations Matrices and Systems of Equations
30	9.1	Matrices and Systems of Equations
31		<b>REVIEW FOR FINAL EXAM</b>
32		<b>COMPREHENSIVE FINAL EXAM (part 1 and 2)</b>

\* Note to instructors regarding section 1.5: Cover only quadratic and higher degree inequalities, and rational functions.

\*\* Note to instructors regarding section 4.4: Please do not cover Logarithmic and Exponential Inequalities.

The **COMPREHENSIVE FINAL** exam will be in two parts. One part prepared by the department, consisting of multiple-choice question in 40-minute time. It will be sent to the instructor in the mail. Another part prepared by the instructor. It may be of any format but should be up to 30 minutes long. The instructor should count the departmental part for 70% of the final exam score and the other part for 30%. The total final exam score should count for 20% of the final course grade. The other three exams should count for 20% each, and the homework and quizzes should count for 20% total. The instructor will be asked to report the scores on the departmental part and the final course grades back to the department.

SINCLAIR COMMUNITY COLLEGE  
DAYTON, OHIO

CLASS SCHEDULE FOR COURSE IN  
**MAT 1470 – COLLEGE ALGEBRA**  
(3 SEMESTER HOURS)

**CLASSES MEETING 3 TIMES A WEEK**

Lecture	Sections	Topics
1	2.4	Introduction to the Class, Functions
2	2.4	Functions
3	2.5	Properties of Functions
4	2.6	A Library of Functions
5	2.7	Transformations of Functions
6	2.7	Transformations of Functions
7		<i>Catch-up / Review / Holiday</i>
8	2.8	Combining Functions; Composite Functions
9	2.8	Combining Functions; Composite Functions
10	2.9	Inverse Functions
11	2.9	Inverse Functions
12		<i>Review</i>
13		<b>TEST 1 [ 2.4–2.9]</b>
14	3.1	Quadratic Functions
15	3.1	Quadratic Functions

**MAT 1470 – College Algebra**

**3 TIMES A WEEK SECTIONS CLASS SCHEDULE** *(continued)*

Lecture	Sections	Topics
16	3.2	Polynomial Functions
17	3.2	Polynomial Functions
18	3.3	Dividing Polynomials
19	3.4	The Real Zeros of a Polynomial Function
20	3.4	The Real Zeros of a Polynomial Function
21	3.5	Complex Zeros of a Polynomial Function
22	3.6	Rational Functions
23	3.6	Rational Functions
24	3.6	Rational Functions
25	1.5*	Inequalities*
26	1.5*	Inequalities*
27		<i>Catch-up / Review / Holiday</i>
28		<i>Review</i>
29		<b>TEST 2 [1.5, 3.1–3.6]</b>
30	4.1	Exponential Functions
31	4.1 4.2	Exponential Functions Logarithmic Functions
32	4.2	Logarithmic Functions
33	4.3	Rules of Logarithms

\* Note to instructors regarding section 1.5: Cover only quadratic and higher degree inequalities, and rational functions.

**MAT 1470 – College Algebra**

**3 TIMES A WEEK SECTIONS CLASS SCHEDULE** (*continued*)

Lecture	Sections	Topics
34	4.3	Rules of Logarithms
35	4.4**	Exponential and Logarithmic Equations and Inequalities**
36	4.4**	Exponential and Logarithmic Equations and Inequalities**
37	4.4**	Exponential and Logarithmic Equations and Inequalities**
38	8.1	Systems of Linear Equations in Two Variables
39	8.2	Systems of Linear Equations in Three Variables
40		<i>Catch-up / Review / Holiday</i>
41		<i>Review</i>
42		<b>TEST 3 [4.1–4.4, 8.1-8.2]</b>
43	8.4	Systems of Nonlinear Equations
44	9.1	Matrices and Systems of Equations
45	9.1	Matrices and Systems of Equations
46		REVIEW FOR FINAL EXAM
47		<b>COMPREHENSIVE FINAL EXAM (part 1)</b>
48		<b>COMPREHENSIVE FINAL EXAM (part 2)</b>

\*\* Note to instructors regarding section 4.4: Please do not cover Logarithmic and Exponential Inequalities.

The **COMPREHENSIVE FINAL** exam will be in two parts. One part prepared by the department, consisting of multiple-choice question in 40-minute time. It will be sent to the instructor in the mail. Another part prepared by the instructor. It may be of any format but should be up to 30 minutes long. The instructor should count the departmental part for 70% of the final exam score and the other part for 30%. The total final exam score should count for 20% of the final course grade. The other three exams should count for 20% each, and the homework and quizzes should count for 20% total. The instructor will be asked to report the scores on the departmental part and the final course grades back to the department.

DAYTON, OHIO

CLASS SCHEDULE FOR COURSE IN  
**MAT 1470 – COLLEGE ALGEBRA**  
(3 SEMESTER HOURS)

**SUMMER CLASSES MEETING 3 TIMES A WEEK**

<b>Week</b>	<b>Sections</b>	<b>Topics</b>
1	2.4	Introduction to the Class, Functions
	2.5	Properties of Functions
	2.6	A Library of Functions
2	2.7	Transformations of Functions
	2.8	Combining Functions; Composite Functions
		<i>Catch-up / Review / Holiday</i>
3	2.9	Inverse Functions
	2.9	Inverse Functions <i>Review</i>
		<b>TEST 1 [ 2.4–2.9]</b>
4	3.1	Quadratic Functions
	3.1 3.2	Quadratic Functions Polynomial Functions
	3.2	Polynomial Functions



**MAT 1470 – College Algebra**

**SUMMER CLASSES MEETING 3 TIMES A WEEK (*continued*)**

<b>Week</b>	<b>Sections</b>	<b>Topics</b>
5	3.3	Dividing Polynomials
	3.4	The Real Zeros of a Polynomial Function
	3.5	Complex Zeros of a Polynomial Function
6	3.6	Rational Functions
	3.6	Rational Functions
	1.5*	Inequalities*
7	1.5*	Inequalities*
		<i>Catch-up / Review / Holiday</i>
		<i>Review</i>
		<b>TEST 2 [1.5, 3.1–3.6]</b>
8	4.1	Exponential Functions
	4.1	Exponential Functions
	4.2	Logarithmic Functions
	4.2	Logarithmic Functions

\* Note to instructors regarding section 1.5: Cover only quadratic and higher degree inequalities, and rational functions.

**MAT 1470 – College Algebra**

**SUMMER CLASSES MEETING 3 TIMES A WEEK (continued)**

<b>Week</b>	<b>Sections</b>	<b>Topics</b>
9	4.3	Rules of Logarithms
	4.4**	Exponential and Logarithmic Equations and Inequalities**
	4.4**	Exponential and Logarithmic Equations and Inequalities**
10	8.1	Systems of Linear Equations in Two Variables
	8.2	Systems of Linear Equations in Three Variables
		<i>Review</i>
11		<b>TEST 3 [4.1–4.4, 8.1-8.2]</b>
	8.4	Systems of Nonlinear Equations
	9.1	Matrices and Systems of Equations
12		<i>Catch-up / Review / Holiday</i>
		<b>REVIEW FOR THE FINAL EXAM</b>
		<b>COMPREHENSIVE FINAL EXAM</b>

\*\* Note to instructors regarding section 4.4: Please do not cover Logarithmic and Exponential Inequalities.

The **COMPREHENSIVE FINAL** exam will be in two parts. One part prepared by the department, consisting of multiple-choice question in 40-minute time. It will be sent to the instructor in the mail. Another part prepared by the instructor. It may be of any format but should be up to 30 minutes long. The instructor should count the departmental part for 70% of the final exam score and the other part for 30%. The total final exam score should count for 20% of the final course grade. The other three exams should count for 20% each, and the homework and quizzes should count for 20% total. The instructor will be asked to report the scores on the departmental part and the final course grades back to the department.

SINCLAIR COMMUNITY COLLEGE  
DAYTON, OHIO

CLASS SCHEDULE FOR COURSE IN  
**MAT 1470 – COLLEGE ALGEBRA**  
(3 SEMESTER HOURS)

**SUMMER CLASSES MEETING 2 TIMES A WEEK**

Week	Sections	Topics
1	2.4	Introduction to the Class, Functions
	2.5 2.6	Properties of Functions A Library of Functions
2	2.7	Transformations of Functions
	2.8	<i>Catch-up / Review / Holiday</i> Combining Functions; Composite Functions
3	2.8 2.9	Combining Functions; Composite Functions Inverse Functions
	2.9	Inverse Functions <i>Review</i>
4	<b>TEST 1 [ 2.4–2.9]</b>	
	3.1	Quadratic Functions
	3.1 3.2	Quadratic Functions Polynomial Functions
5	3.2	Polynomial Functions
	3.3	Dividing Polynomials
	3.4	The Real Zeros of a Polynomial Function
6	3.5	Complex Zeros of a Polynomial Function
	3.6	Rational Functions
	3.6	Rational Functions
7	1.5*	Inequalities*
	<i>Catch-up / Review / Holiday</i>	
8	<b>TEST 2 [1.5, 3.1–3.6]</b>	
	4.1	Exponential Functions
	4.1 4.2	Exponential Functions Logarithmic Functions

\* Note to instructors regarding section 1.5: Cover only quadratic and higher degree inequalities, and rational functions.

**MAT 1470 – College Algebra**

**SUMMER CLASSES MEETING 3 TIMES A WEEK (continued)**

<b>Week</b>	<b>Sections</b>	<b>Topics</b>
9	4.3	Rules of Logarithms
	4.4**	Exponential and Logarithmic Equations and Inequalities**
10	4.4**	Exponential and Logarithmic Equations and Inequalities**
	8.1	Systems of Linear Equations in Two Variables
	8.2	Systems of Linear Equations in Three Variables
		<i>Catch-up / Review / Holiday</i>
11		<i>Review</i> <b>TEST 3 [4.1–4.4, 8.1-8.2]</b>
	8.4	Systems of Nonlinear Equations
	9.1	Matrices and Systems of Equations
12	9.1	Matrices and Systems of Equations
		<b>REVIEW FOR FINAL EXAM</b>
		<b>COMPREHENSIVE FINAL EXAM</b>

\*\* Note to instructors regarding section 4.4: Please do not cover Logarithmic and Exponential Inequalities.

The **COMPREHENSIVE FINAL** exam will be in two parts. One part prepared by the department, consisting of multiple-choice question in 40-minute time. It will be sent to the instructor in the mail. Another part prepared by the instructor. It may be of any format but should be up to 30 minutes long. The instructor should count the departmental part for 70% of the final exam score and the other part for 30%. The total final exam score should count for 20% of the final course grade. The other three exams should count for 20% each, and the homework and quizzes should count for 20% total. The instructor will be asked to report the scores on the departmental part and the final course grades back to the department.

## MAT 1470 Course Formulas

### Prerequisite Formulas

Formulas of special importance that students are expected to know upon entering this course.

- Distance Formula  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- Midpoint Formula  $M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$
- Slope of a Line  $m = \frac{y_2 - y_1}{x_2 - x_1}$
- Forms of linear Equations
  - Slope-Intercept Form  $y = mx + b$
  - Point-Slope Form  $y - y_1 = m(x - x_1)$
  - Horizontal Line  $y = b$
  - Vertical Line  $x = a$

**Course Formulas** - Formulas that students are required to memorize in this course:

### Chapter 3

- Quadratic Function  $f(x) = ax^2 + bx + c$ ; vertex  $\left( \frac{-b}{2a}, f\left(\frac{-b}{2a}\right) \right)$   
 $f(x) = a(x - h)^2 + k$ ; vertex  $(h, k)$
- Quadratic Formula If  $ax^2 + bx + c = 0$ ,  $a \neq 0$  then  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

### Chapter 4

- Rules of Exponents ( $a > 0, b > 0$ )

$$a^x a^y = a^{x+y}, \quad \frac{a^x}{a^y} = a^{x-y}, \quad (a^x)^y = a^{xy}, \quad a^0 = 1, \quad a^{-x} = \frac{1}{a^x}$$

- Definition of Logarithm  $y = \log_a x$  if and only if  $a^y = x$  (with  $a > 0$ ,  $a \neq 1$ ,  $x > 0$ )
- Properties of Logarithms  $\log_a a = 1$ ,  $\log_a a^x = x$ ,  $\log_a 1 = 0$ ,  $a^{\log_a x} = x$

## Mat 1470 - College Algebra Course Formulas (*Continued*)

### Chapter 4 (Cont)

- Laws of Logarithms

$$\log_a(MN) = \log_a M + \log_a N \quad \log_a\left(\frac{M}{N}\right) = \log_a M - \log_a N \quad \log_a M^r = r \log_a M$$

- Change of Base Formula  $\log_b x = \frac{\log_a x}{\log_a b}$

- Exponential Growth and Decay  $A(t) = A_0 e^{kt}, k > 0$        $A(t) = A_0 e^{-kt}, k > 0$

- Simple Interest:  $I = Prt$       Future value  $P(t) = P + Prt$

- Compound Interest  $A(t) = P\left(1 + \frac{r}{n}\right)^{nt}$       Continuous Compounding  $A(t) = Pe^{rt}$