**UNION COUNTY COLLEGE**

**MASTER COURSE SYLLABUS**

COURSE NUMBER & NAME: MAT 119 Algebra

LECTURE/LAB HOURS: 4 lecture hours

CREDITS: 4 credits

PREREQUISITES: MAT-021 or MAT-022, and ENG-097, or satisfactory performance on the College Basic Skills Test for Algebra.

# COURSE DESCRIPTION:

This course is for students who have mastered basic algebra and need a deeper understanding of algebra before progressing to other credit mathematics courses. Topics include solving linear and quadratic equations and inequalities, absolute value equations and inequalities, graphs of linear and quadratic equations, equations of lines, systems of equations, introduction to functions, quadratic functions, polynomials functions, rational functions, radical functions, rational exponents and applications.

COURSE LEARNING OUTCOMES:

This course is designed to review basic algebra skills, to teach the students more complex algebra topics, and to prepare the students to take next level mathematics courses. Some general mathematical goals of this course include teaching students to use correct notation, to be clear in their solutions, to problem-solve, to go deeper into topics that were introduced in Basic Algebra, and to introduce them to functions and additional types of equations. As a result of taking this course, students’ skills in algebra will be reinforced and strengthened, their algebra knowledge will be expanded, and they will be ready to continue mathematical study.

Students will be able to:

* Simplify algebraic and exponential expressions.
* Recognize linear functions, quadratic functions, rational functions, radical functions, and systems of linear equations algebraically.
* Evaluate linear functions, quadratic functions, rational functions, radical functions, and systems of linear equations.
* Solve linear inequalities, and linear, rational, quadratic, and radical equations and systems of linear equations and their applications.
* Graph linear functions.
* Interpret graphs.

REQUIRED MATERIAL:

Intermediate Algebra, 7th Edition   
Elayn Martin-Gay

Pearson, Bundled with MyMathLab

Use of the Academic Learning Center (ALC), specifically the Mathematics Success Center (MSC), for extra tutoring assistance and online tutoring programs are recommended. The software available with the textbook can be used as a tutorial as well.

Online students must have system requirements, required software, and technology competency, and are required to take proctored exams, presenting the instructor with a valid photo ID.

Four function calculators are permitted.

GRADING POLICY:

The following is a suggested model for evaluation to be determined by the instructor:

Online:

* Homework
* Quizzes
* Midterm Exam
* Final Exam

Face-to-Face:

* Class work
* Homework
* Quizzes
* Tests
* Final Exam

Make sure to include exactly what each element will contribute (percentage) towards final grade.

INFORMATION LITERACY COMPONENT:

An essential element of this course includes information literacy. *Information literacy* is the evaluation and assessment of integrated information. An understanding of its ramifications and implications through the critical use of information literacy will be discussed. Students will be able to locate, discern, and effectively use information to solve issues and or problems in order to become independent learners.

**CLASS POLICIES: (individualize – address attendance, punctuality, make-up work, class conduct, work submission, academic integrity, late withdrawal policy, important dates, etc.) May be attached at the end.**

ACCOMMODATIONS:

Union County College offers reasonable accommodations and/or services to persons with disabilities. Any student who has a documented disability and wishes to self-identify should contact the Coordinator of Services for Students with Disabilities at (908) 709-7164, or email [disabilitysvc@ucc.edu](https://webmail.ucc.edu/owa/redir.aspx?C=dTb0DpIkZEyBfeC7AInmSwMsJMB18M8IXIgrMnfp977tyfgO0ZTCzs-Gz7c49kR9NSoGOFrvslg.&URL=mailto%3adisabilitysvc%40ucc.edu). Accommodations are *individualized* and in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1992. In order to receive accommodations, students must be registered with the Disability Services Office. Students should register with the office as soon as possible. Accommodations are not official until the Faculty Accommodations Alert Form(s) are issued from the student to his/her instructor(s).

\*Revised 11/16 by Tracy K. Abar

| **UNITS** | **CLASS MTGS.** | **TEXT ASSIGNMENT**  **CHAP. PAGES** | | **TOPICS** | **ASSIGNMENT**  **PROBLEMS OR QUESTIONS** |
| --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1.2 | 8-15 | Algebraic Expressions and Sets of Numbers | p. 16-17 # 1-29 odd, 31-36 all, 37-92 odd, 93-96 all |
|  | 2 | 1.3 | 18-27 | Operations on Real Numbers | p. 28-30 # 1-93 odd |
|  | 1 | 1.4 | 31-39 | Properties of Real Numbers | p. 40-41 # 1-33 odd, 35-53 odd, 73, 75-97 odd |
| 2 | 1 | 2.1 | 50-56 | Linear Equations in One Variable | p. 57-58 # 1-65 odd, 67-72 all |
|  | 1 | 2.2 | 59-65 | An Introduction to Problem Solving | p. 65-70 # 1-15 odd, 19, 21-24 all, 25, 27, 31, 33, 37, 49, 51 |
|  | 1 | 2.3 | 71-74 | Formulas and Problem Solving | p. 75-78 # 1-21 odd, 29, 33, 37 |
|  | 1 | 2.4 | 79-86 | Linear Inequalities and Problem Solving \* | p. 87-90 # 1-75 odd, 99-104 all |
|  | 1 | 2.5 | 91-95 | Compound Inequalities | p. 96-98 # 1, 3, 13-29 odd, 33-69 odd |
|  | 1 | 2.6 | 98-102 | Absolute Value Equations | p. 102-103 # 1-21 odd, 27-61 odd |
|  | 1 | 2.7 | 103-107 | Absolute Value Inequalities | p. 107-108 # 1-61 odd, 65-79 odd |
|  | 1 |  |  | Review |  |
|  | 1 |  |  | TEST #1 |  |
|  |  |  |  |  |  |
| 3 | 1 ½ | 3.1 | 120-128 | Graphing Equations | p. 129-131 # 1-9 odd, 17-47 odd, 63-68 all |
|  | 2 | 3.2 | 131-141 | Introduction to Functions | p. 142-146 # 1-17 odd, 23-28 all, 29-39 odd, 43-67 odd, 69-79 all |
|  | 1 | 3.3 | 147-151 | Graphing Linear Functions | p. 152-154 # 3, 5, 7, 9-12 all, 13-25 odd, 27-30 all, 35, 41, 43, 45, , 47, 49, 51, 73, 75 |
|  | 1 | 3.4 | 155-163 | The Slope of a Line | p. 164-168 # 1, 5, 11, 13, 19-35 odd, 37-40 all, 41-45 odd, 47, 61-69 odd, 79, 81 |
|  | 1 | 3.5 | 168-174 | Equations of Lines | p. 175-178 # 1-33 odd, 35-46 all, 47, 49, 53-73 odd, 77,79 |
| 4 | 1 | 4.1 | 206-215 | Solving Systems of Linear Equations in Two Variables | p. 216-218 # 1-17 odd, 23-31 odd, 35, 39-59 every other odd |
|  | 1 | 4.3 | 225-233 | Systems of Linear Equations and Problem Solving | p. 234-238 # 1, 3, 5, 7, 9, 11, 13, 17, 19, 25 |
|  | 1 |  |  | Review |  |
|  | 1 |  |  | TEST #2 |  |
|  |  |  |  |  |  |
| 5 | 1 | 5.1 | 260-266 | Exponents | p. 267-268 # 1-87 odd, 99-107 odd, 117-125 odd |
|  | 1 | 5.2 | 269-272 | More Work with Exponents | p.273- 274 # 1-65 odd, 83 odd |
|  | ½ | 5.3 | 275-283 | Polynomials and Polynomial Functions | p. 284-287 # 1-23 odd, 29-39 odd, 43, 45-53 odd, 55-67 odd, 73, 75, 77, 111, 113, 119 |
|  | ½ | 5.4 | 287-293 | Multiplying Polynomials | p. 293-295 # 1, 7, 9, 11, 13, 19, 21,25, 27, 29-37 odd, 45, 47-81 odd, 107 |
|  | 1 | 5.5 | 296-299 | The Greatest Common Factor and Factoring by Grouping | p. 299-301 # 1-21 odd, 25-69 odd,75-80 all, 81 |
|  | 1 | 5.6 | 302-307 | Factoring Trinomials | p. 308-309 # 1-93 odd |
|  | 1 | 5.7 | 310-313 | Factoring by Special Products | p. 314-315 # 1-65 odd, 75, 77, 80 |
|  | 1 | 5.8 | 319-327 | Solving Equations by Factoring and Problem Solving | p. 327-331 # 3, 5-25 odd, 29-63 odd, 69, 71, 75 |
| 6 | 2 | 6.1 | 342-350 | Rational Functions and Multiplying and Dividing Rational Expressions | p. 351-354 # 1-9 odd, 11, 13-67 odd, 71, 83, 85, 87, 93 |
|  | 1 ½ | 6.2 | 354-359 | Adding and Subtracting Rational Expressions | p. 359-361 # 1-33 odd, 37, 41-59 odd, 73, 75 |
|  | 1 | 6.3 | 362-366 | Simplifying Complex Fractions | p. 366-368 # 1-31 odd, 35, 37, 41, 43 |
|  | 1 | 6.4 | 368-375 | Dividing Polynomials: Long Division and Synthetic Division | p. 376-378 # 3-15 odd, 21-37 odd, 41, 47,51 |
|  | 1 | 6.5 | 378-382 | Solving Equations Containing Rational Expressions | p. 383-385 # 1-45 odd |
|  | 1 | 6.6 | 387-393 | Rational Equations and Problem Solving | p. 393-396 # 1, 3, 5, 7, 9, 13, 15, 19, 23, 27, 29, 31, 39, 49, 51 |
|  | 1 |  |  | Review |  |
|  | 1 |  |  | TEST #3 |  |
|  |  |  |  |  |  |
| 7 | 1 | 7.1 | 417-422 | Radicals and Radical Functions | P. 423-425 # 1, 3, 7-11 odd, 19-51 odd, 55-79 odd |
|  | 2 | 7.2 | 426-430 | Rational Exponents | p. 431-432 # 1-95 odd |
|  | 2 | 7.3 | 433-439 | Simplifying Radical Expressions | p. 439-441 # 1-29 odd, 31-69 odd, 77, 79, 89, 95 |
|  | 1 | 7.4 | 441-445 | Adding, Subtracting, and Multiplying Radical Expressions | p. 445-446 # 1-39 odd, 47-69 odd |
|  | 1 | 7.5 | 447-451 | Rationalizing Denominators and Numerators of Radical Expressions | p. 452-453 # 1-33 odd, 41-75 odd |
|  | 1 | 7.6 | 454-459 | Radical Equations and Problem Solving | p. 460-463 # 3-17 odd, 23-39 odd, 43, 45, 51, 59 |
| 8 | 2 | 8.1 | 483-490 | Solving Quadratic Equations by Completing the Square | p. 490-492 # 1-13 odd, 17, 23, 35-49 odd, 59, 63, 69 |
|  | 1 | 8.2 | 493-499 | Solving Quadratic Equations by the Quadratic Formula | p. 500-503 # 1-21 odd, 25, 29, 33, 37, 39, 41-49 odd, 51, 55 |
|  | 1 | 8.3 | 503-508 | Solving Equations Using Quadratic Methods | p. 509-512 # 3, 5, 7, 11, 17, 21, 31, 33, 37, 43, 59, 61, 63, 67 |
|  | 1 |  |  | Review |  |
|  | 1 |  |  | TEST #4 |  |
|  | 1 |  |  | Review for Final Exam |  |

\*Interval Notation is very important. Require this notation from this point forward in the course for answers that involve intervals.

**UNION COUNTY COLLEGE**

**MAT119 (Section) Algebra**

**Semester, Days/Times/Room**

**Prof. \_\_\_\_\_\_\_\_\_\_**

**Contact Info: (email, phone, office location)**

**Office Hours**

COURSE NUMBER & NAME: MAT 119 Algebra

LECTURE/LAB HOURS: 4 lecture hours

CREDITS: 4 credits

PREREQUISITES: ENG089, a satisfactory score on the College Basic Skills Test for Computation and Algebra, or grade of “C” or better in MAT011, and MAT015/MAT016 or MAT022.

# COURSE DESCRIPTION:

This course is for students who have mastered basic algebra and need a deeper understanding of algebra before progressing to other credit mathematics courses. Topics include solving linear and quadratic equations and inequalities, absolute value equations and inequalities, graphs of linear and quadratic equations, equations of lines, systems of equations, introduction to functions, quadratic functions, polynomials functions, rational functions, radical functions, rational exponents and applications.

This course is designed to review basic algebra skills, to teach the students more complex algebra topics, and to prepare the students to take next level mathematics courses. Some general mathematical goals of this course include teaching students to use correct notation, to be clear in their solutions, to problem-solve, to go deeper into topics that were introduced in Basic Algebra, and to introduce them to functions and additional types of equations. As a result of taking this course, students’ skills in algebra will be reinforced and strengthened, their algebra knowledge will be expanded, and they will be ready to continue mathematical study.

COURSE LEARNING OUTCOMES:

Students will be able to:

* Simplify algebraic and exponential expressions.
* Recognize linear functions, quadratic functions, rational functions, radical functions, and systems of linear equations algebraically.
* Evaluate linear functions, quadratic functions, rational functions, radical functions, and systems of linear equations.
* Solve linear inequalities, and linear, rational, quadratic, and radical equations and systems of linear equations and their applications.
* Identify linear, quadratic, rational and radical functions and their graphs.
* Graph linear functions.
* Interpret graphs.

STUDENT RESOURCES

Intermediate Algebra, 7th Edition   
Elayn Martin-Gay

Pearson, Bundled with MyMathLab

Texts and software are subject to change, including updates to current editions; check with your specific course instructor prior to purchasing the text or online component. Appropriate software and materials are required to support online instruction. You may check the Distance Education web page at the College web site for more information.

Use of the Academic Learning Center (ALC), specifically the Mathematics Success Center (MSC), for extra tutoring assistance and online tutoring programs are recommended. The software available with the textbook can be used as a tutorial as well.

Basic Non- Scientific Calculators are permitted, NO Scientific or Graphing Calculators.

# COURSE REQUIREMENTS:

The STEM division adheres to the College attendance policy, which can be found at [http://owlsnest.ucc.edu/academics/Policies/Pages/Attendance.aspx](https://webmail.ucc.edu/owa/redir.aspx?C=pUT3vV3fTUSfb3A2_ZUjW-K2nG0EhtEITpgc9OboQdbYeJpuoYy0DExWhBRiEzmm6lYXhRlmG50.&URL=http%3a%2f%2fowlsnest.ucc.edu%2facademics%2fPolicies%2fPages%2fAttendance.aspx). Attendance is required to properly learn the material and meet course expectations.

* Attendance at all classes, including class participation.
* Completion of assigned homework.
* Exams and/or quizzes.
* A cumulative final exam is required.

Online students must have system requirements, required software, and technology competency, and are required to take proctored exams, presenting the instructor with a valid photo ID.

ACCOMMODATIONS:

Union County College offers reasonable accommodations and/or services to persons with disabilities. Any student who has a documented disability and wishes to self-identify should contact the Coordinator of Services for Students with Disabilities at (908) 709-7164, or email [disabilitysvc@ucc.edu](https://webmail.ucc.edu/owa/redir.aspx?C=dTb0DpIkZEyBfeC7AInmSwMsJMB18M8IXIgrMnfp977tyfgO0ZTCzs-Gz7c49kR9NSoGOFrvslg.&URL=mailto%3adisabilitysvc%40ucc.edu). Accommodations are *individualized* and in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1992. In order to receive accommodations, students must be registered with the Disability Services Office. Students should register with the office as soon as possible. Accommodations are not official until the Faculty Accommodations Alert Form(s) are issued from the student to his/her instructor(s).

**EVALUATION METHODS:** **(as determined by the instructor – individualize & include % or point breakdown)**

The following is a suggested model for evaluation to be determined by the instructor:

* Class work
* Homework
* Quizzes
* Midterm Exam
* Final Exam

Late Withdrawals are considered in extenuating situations only, and require official documentation. Review the late withdrawal form for details.

**CLASS POLICIES: (individualize – address attendance, punctuality, make-up work, class conduct, work submission, academic integrity, late withdrawal policy, important dates, etc.) May be attached at the end.**

CLASS SCHEDULE:

The exact schedule of topics will be determined by the instructor.

| **TOPICS** |
| --- |
| Algebraic Expressions and Sets of Numbers |
| Operations on Real Numbers |
| Properties of Real Numbers |
| Linear Equations in One Variable |
| An Introduction to Problem Solving |
| Formulas and Problem Solving |
| Linear Inequalities and Problem Solving |
| Compound Inequalities |
| Absolute Value Equations |
| Absolute Value Inequalities |
| Review |
| TEST #1 |
|  |
| Graphing Equations |
| Introduction to Functions |
| Graphing Linear Functions |
| The Slope of a Line |
| Equations of Lines |
| Solving Systems of Linear Equations in Two Variables |
| Systems of Linear Equations and Problem Solving |
| Review |
| TEST #2 |
|  |
| Exponents |
| More Work with Exponents |
| Polynomials and Polynomial Functions |
| Multiplying Polynomials |
| The Greatest Common Factor and Factoring by Grouping |
| Factoring Trinomials |
| Factoring by Special Products |
| Solving Equations by Factoring and Problem Solving |
| Rational Functions and Multiplying and Dividing Rational Expressions |
| Adding and Subtracting Rational Expressions |
| Simplifying Complex Fractions |
| Dividing Polynomials: Long Division and Synthetic Division |
| Solving Equations Containing Rational Expressions |
| Rational Equations and Problem Solving |
| Review |
| TEST #3 |
|  |
| Radicals and Radical Functions |
| Rational Exponents |
| Simplifying Radical Expressions |
| Adding, Subtracting, and Multiplying Radical Expressions |
| Rationalizing Denominators and Numerators of Radical Expressions |
| Radical Equations and Problem Solving |
| Solving Quadratic Equations by Completing the Square |
| Solving Quadratic Equations by the Quadratic Formula |
| Integrated Review – Summary on Solving Quadratic Equations |
| Review |
| TEST #4 |