



# MAT 121 101 College Algebra Course Syllabus

*Course Syllabus is subject to modification and will be announced in class and/or posted in D2L*

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## Course Information

**Days:** Tuesday / Thursday

**Location:** Cottonwood 105

**Time:** 8:00 am to 10:45 am

**Credits:** 4

**Contact Hours:** 60 Lecture

**Course Registration #:** 10580

## Instructor Information

**Instructor:** Carol Kuper

**MCC E-Mail:** carol.kuper@morgancc.edu

**Phone:** (970) 542-3202

**Office Location:** Cottonwood 150

**Office Hours:**

Monday / Wednesday 10:00am to 12:00pm

Tuesday / Thursday 11:00am to 12:00pm

### COURSE DATES:

**Semester Begins:** May 29, 2018

**Add/Drop Date:** June 8, 2018

**Withdraw Date:** July 21, 2018

**Semester Ends:** August 3, 2018

### CLASSES NOT IN SESSION:

**Memorial Day:** May 28, 2018

**Grad Application Deadline:** Fall–September 1<sup>st</sup> • Spring–February 1<sup>st</sup> • Summer–July 1<sup>st</sup>

*Students will assume the responsibility of knowing their status in the course and adhering to college policy regarding adding, dropping and withdrawing from a course. To ensure compliance with college policy be sure to mark the important dates in your Student Handbook or Calendar.*

## Course Description

Focuses on a variety of functions and the exploration of their graphs. Topics include: equations and inequalities, operations on functions, exponential and logarithmic functions, linear and non-linear systems, and an introduction to conic sections. This course provides essential skills for Science, Technology, Engineering, and Math (STEM) pathways.

## Guaranteed Transfer (GT) Pathways Course Information

### Statement:

The Colorado Commission on Higher Education has approved MAT 121 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT- MA1 category. For transferring students,

successful completion with a minimum C– grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to [CDHE GT Pathways Information](#).

### **Content Criteria: MATHEMATICS GT-MA1**

- a) Demonstrate good problem-solving habits, including:
  - Estimating solutions and recognizing unreasonable results.
  - Considering a variety of approaches to a given problem, and selecting one that is appropriate.
  - Interpreting solutions correctly.
- b) Generate and interpret symbolic, graphical, numerical, and verbal (written or oral) representations of mathematical ideas.
- c) Communicate mathematical ideas in written and/or oral form using appropriate mathematical language, notation, and style.
- d) Apply mathematical concepts, procedures, and techniques appropriate to the course.
- e) Recognize and apply patterns or mathematical structure.
- f) Utilize and integrate appropriate technology.

### **Competencies/Student Learning Outcomes: Quantitative Literacy**

1. Interpret Information
  - a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
2. Represent Information
  - a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).
3. Perform Calculations
  - a. Solve problems or equations at the appropriate course level.
  - b. Use appropriate mathematical notation.
  - c. Solve a variety of different problem types that involve a multi-step solution and address the validity of the results.
4. Apply and Analyze Information
  - a. Make use of graphical objects (such as graphs of equations in two or three variables, histograms, scatterplots of bivariate data, geometrical figures, etc.) to supplement a solution to a typical problem at the appropriate level.
  - b. Formulate, organize, and articulate solutions to theoretical and application problems at the appropriate course level.
  - c. Make judgments based on mathematical analysis appropriate to the course level.
5. Communicate Using Mathematical Forms
  - a. Express mathematical analysis symbolically, graphically, and in written language that clarifies/justifies/summarizes reasoning (may also include oral communication).

## **Course Learning Outcomes**

1. Identify properties of functions including domain, range, increasing and decreasing.
2. Apply function notation.
3. Determine the inverse of a function.

4. Examine functions algebraically.
5. Analyze behavior and roots of polynomial functions.
6. Solve polynomial, rational and absolute value equations and inequalities.
7. Analyze polynomial, exponential, logarithmic and rational functions.
8. Create graphs of polynomial, exponential, logarithmic and rational functions.
9. Solve exponential and logarithmic equations.
10. Analyze piecewise functions.
11. Graph parent functions and their transformations.
12. Utilize algebraic techniques to solve application problems.
13. Solve systems of equations.
14. Classify conic sections.

## Materials

### Textbook:

College Algebra by Beecher, Penna, & Bittinger, 5<sup>th</sup>, Pearson ISBN 978-0-321-98176-9  
MyMathLab Code bundled with e-book ISBN 978-0-321-19991-1

### Other materials:

1. A MyMathLab code is required for this class and can be purchased separately or bundled with an e-book.
2. Required Calculator: TI-84 Plus or TI-84 Plus C Silver

## Course Requisites

MAT 055 with a C or better; Accuplacer score EA 85 or better or CLM < 63; ACT 23

## Topical Outline

### REQUIRED TOPICAL OUTLINE

- I. Functions including domain, range, increasing and decreasing
  - a. Definition of a function
  - b. Identifying functions given table, graph or equation form
  - c. Domain and range of algebraic functions
  - d. Even and odd functions
  - e. Introduction to where functions are increasing and decreasing using a graph
  - f. Introduction to maxima and minima using a graph
- II. Function notation
  - a. Functions expressed using function notation
  - b. Evaluation of function notation from equations and graphs
- III. Inverse of a function
  - a. Notation of an inverse function
  - b. Definition of one-to-one functions
  - c. Algebraic determination of the inverse of a function

- d. Graphical properties of an inverse function
  - e. Domain and range of an inverse function
- IV. Function composition algebraically
  - a. Sum difference, product, quotient of functions
  - b. Composition notation
  - c. Inverses using composition
  - d. Composition of two functions
- V. Behavior and roots of polynomial functions
  - a. End behavior of polynomial functions
  - b. Division of polynomials
  - c. Polynomials as a product of linear factors
  - d. Multiplicity of zeros
  - e. Complex zeros
- VI. Polynomial, rational and absolute value equations and inequalities
  - a. Completing the square to find the vertex form of a quadratic function
  - b. Absolute value inequalities
  - c. Polynomial and rational inequalities using test intervals (critical values, number lines)
- VII. Analysis of polynomial, exponential, logarithmic and rational functions
  - a. Intercepts and End behavior
  - b. Zeros
  - c. Definition of exponential and logarithmic functions
  - d. Domain and range
  - e. Evaluation of exponential and logarithmic expressions
  - f. Introduction to the number  $e$
  - g. Equations of asymptotes
- VIII. Graphs of polynomial, exponential, logarithmic and rational functions
  - a. Intercepts and end behavior
  - b. Asymptotes of functions from the equation and from the graph
- IX. Solutions of exponential and logarithmic equations
  - a. Conversion between exponential and logarithmic form
  - b. Properties of logarithms
  - c. Logarithmic equations
  - d. Extraneous solutions
  - e. Exponential equations
- X. Piecewise functions
  - a. Notation for piecewise functions
  - b. Evaluation of piecewise functions
  - c. Graphs of piecewise functions
  - d. Domain of piecewise functions
- XI. Parent functions and their transformations
  - a. Parent (also called base/toolbox) functions
  - b. Rigid transformations (horizontal/vertical translations and reflections)
  - c. Non-rigid transformations (horizontal/vertical scaling)
- XII. Algebraic techniques to solve application problems
  - a. Quadratic models including optimization
  - b. Exponential/logarithmic models

- XIII. Systems of equations
  - a. Methods for solving systems with three variables or more
  - b. Systems of non-linear equations with two variables
- XIV. Conic sections
  - a. Circle
  - b. Parabola
  - c. Ellipse
  - d. Hyperbola

### RECOMMENDED TOPICAL OUTLINE

- I. Function notation
  - a. Difference quotient
- II. Function composition algebraically
  - a. Domain of a composite function
  - b. Decomposition of a function
- III. Behavior and roots of polynomial functions
  - a. The Rational Root Theorem
  - b. The Remainder Theorem and the Factor Theorem
- IV. Polynomial, rational and absolute value equations and inequalities
  - a. Methods of solving quadratic equations
  - b. Solving equations reducible to quadratic form using substitutions
  - c. Review of solving rational equations
- V. Graphs of exponential, logarithmic and rational functions
  - a. Identifying the removable discontinuities of a rational function
  - b. Determining if a graph crosses horizontal asymptotes
  - c. Exponential and logarithmic equations
  - d. Change of base formula
- VI. Algebraic techniques to solve application problems
  - a. Direct and inverse variation
- VII. Systems of equations
  - a. Types of solutions (consistent, inconsistent, independent and dependent)
- VIII. Conic sections
  - a. Analysis of the properties of conic sections

## Detailed Schedule

### Week One:

Preparation: Read Chapter 1 sections 1, 2, 3, 4 & 5

Assignment: Complete Student Contract, MML orientation, Just in Time Review CH 1, sections 1, 2, 3, 4 & 5

### Week Two:

Preparation: Read Chapter 1 section 6, Print review for Exam 1 & Chapter 2 section 1, 2, 3 & 4

Assignment: MML Chapter 1 section 6, Exam 1, Just in Time Review CH 2, & Chapter 2 section 1, 2, 3 & 4

### Week Three:

Preparation: Read Chapter 2 section 5, Print review for Exam 2 & Chapter 3 section 1

Assignment: MML Chapter 2 sections 5, Exam 2, Just in Time Review CH 3 & Chapter 3 Section 1

### Week Four:

Preparation: Read Chapter 3 sections 2, 3, 4 & 5, Print review for Exam 3  
Assignment: MML Chapter 3 sections 2, 3, 4 & 5, Just in Time Review CH 4

#### Week Five:

Preparation: Read Chapter 4 sections 1, 2 & 3  
Assignment: MML Chapter 4 sections 1, 2 & 3

#### Week Six:

Preparation: Read Chapter 4 sections 4 & 5  
Assignment: MML Chapter 4 sections 4 & 5

#### Week Seven:

Preparation: Read Chapter 4 section 6, Print review for Exam 4 & Chapter 5 section 2  
Assignment: MML Chapter 4 section 6, Exam 4, Just in Time Review CH 5 & Chapter 5 section 2

#### Week Eight:

Preparation: Read Chapter 5 sections 3, 4, 5 & 6  
Assignment: Exam Chapter 5 sections 3, 4, 5 & 6, Just in Time Review CH 6

#### Week Nine:

Preparation: Read Chapter 6 sections 3, 4, 6 & 7, Print review for Exam 5  
Assignment: MML Chapter 6 sections 3, 4, 6 & 7, Exam 5

#### Week Ten:

Preparation: Read Review for Final Exam  
Assignment: Final Exam

## Course Grading

### Grading Scale

Letter Grade	Percentage	Level of Mastery
A	90% - 100%	Superior mastery of the course competencies
B	80% - 89%	Above average mastery of the course competencies
C	70% - 79%	Minimum acceptable mastery of the course competencies
D	60% - 69%	Less than acceptable mastery of the course competencies
F	59% - below	Fails to demonstrate achievement of the course competencies

### MyMathLab Assignments (15% of the overall final grade):

Utilizing the online homework system, MyMathLab, students will practice and review topics from the lecture in preparation for the chapter exam. To maintain proper progress in the course students should adhere to the Tuesday soft deadlines. Homework will not be accessible, hard deadline, after the date listed in MyMathLab which typically occurs the night preceding the exam. All work from MyMathLab, should be kept in the notes/homework composition book and used to take in-class quizzes and test preparation. Within MML missed problems can be resubmitted as many times as needed. Working and reworking the homework sets will greatly increase your understanding of the course material and will result in higher test scores. Please be sure to keep up with the homework and see me if you have any questions.

### Quizzes / In Class Assignments (5% of the overall final grade):

Announced and unannounced in-class work and quizzes will be given throughout the semester. Lectures will consist of the topic's history, a demonstration, and an opportunity for students to work

with others and try the problems. Some of the problems and/or activities done in class will need to be turned in. Attendance will ensure you are aware of the items that need to be submitted. The notes/homework composite notebook may be used on the quizzes. Content of the quizzes will consist of the information given in lecture, videos and vocabulary/conceptual understanding of the reading material. In-class work and quizzes cannot be made up and no exceptions or extensions will be given.

### **Exams (60% of the overall final grade):**

Six chapter exams will be given throughout the semester. Scoring for each question on the exam will range from 1 to 4 points depending on the difficulty level. Be sure to show ample work to receive partial credit as points will be awarded for the correct process (setup, algebraic steps) and the correct answer. Missed exams will result in a zero. No late exams will be given except in cases of extreme emergencies with verification. Students always have the option of taking the exams early in the testing center on campus when the instructor is given 24 hour notice and the exam is completed prior to the scheduled time and day of the exam. The chapter exam with the lowest score will be dropped prior to calculating the final grade in the course.

### **Final Exam (20% of the overall final grade):**

One mandatory final exam will be given the last day of class covering material from the entire course. The final exam may not be dropped and if not taken will result in a zero. A thorough review will be conducted prior to the exam.

### **Attendance:**

Attendance is not mandatory but will be taken daily through a sign-in sheet. Students are expected to attend each class and participate in the group/practice problems. Randomly throughout the semester, there may be a quiz or group activity that will need completed and attendance will ensure you do not miss these opportunities to receive points. Please inform the instructor of a long absence, as students may be withdrawn from the course for excessive non-attendance.

### **Late Work:**

A documented personal or family emergency is the only time late work will be accepted. When possible 24 hour notice should be given.

### **Extra Credit:**

Extra credit is rarely given. Please plan your schedule for completing assignments with the assumption that no extra credit will be given.

## **Study Expectations**

Throughout this course, you will need to invest a significant portion of your time outside of class each week throughout the semester to successfully complete this course - **expect to spend at least 12 hours per week on this course.**

## **Instructional Method**

This course will utilize the following instructional methods.

### **Traditional Instruction:**

Students will attend lectures/labs in person at the specified location(s). Students are expected to attend at the scheduled time and location for the course. Students are expected to complete 1-2 hours of homework/studying for each hour of lecture. Homework may also utilize traditional and/or online learning methods.

## Teaching Philosophy

This course uses best practices, including use of manipulatives, group work, projects, proper integration of technology, and discourse along with study and organization skills to enhance student academic success.

## Incorporation of Critical Thinking Skills into the Course

Throughout this course, students will read required material. Students will then have to think critically about possible ways to solve the mathematical problems placed before them and communicate the solutions algebraically, graphically, or using a written explanation.

## MCC Assessment

The objectives of this course support the attainment of Morgan Community College's General Student Outcomes, which includes Communication, Critical Inquiry, Intra/Interpersonal Responsibility, Quantitative Reasoning and Information Literacy.

## Resources and Support

<b>Tutorial/Tech Support</b>	<b>Phone Numbers</b>
Tutorial Center	(970) 542-3229
D2L Support	(970) 542-3209
WebEx Support	(970) 542-3182

<b>MCC Departments</b>	<b>Phone Numbers</b>
Student Services/Advising	(970) 542-3167
Career Counseling	(970) 542-3100
Testing Center	(970) 542-3188
Learning Resource Center (Library)	(970) 542-3185

## Course Expectations

### Classroom Etiquette/Behavioral Expectations

Students are to adhere to the MCC's Student Code of Conduct. Information can be found within the catalog under Student Rights and Responsibilities. For more information, visit our current [Catalog - http://www.morgancc.edu/programs/academic-catalogs/](http://www.morgancc.edu/programs/academic-catalogs/).

Students are to attend class, to participate, and to ask questions as needed. Consistent computer work will be a component of the course, and daily attendance is required. Civility and respect toward classmates and instructor are necessary to promote a positive learning environment. Any behavior that disrupts the positive learning environment will not be tolerated, and the student may be asked to leave.



## **Academic Integrity Policy**

Students are accountable for the work they submit. If a student submits work that is copied (entirely or partially) directly from another source (textbook, internet resource, another student's work, etc.), it is considered plagiarism. The penalty for plagiarism can range from a zero on the assignment to being withdrawn from the course.

## **Electronics Policy**

Cell phone calling and texting is not permitted in class. Please turn off phones, iPods, and other electronic devices during lessons and exams (unless being used for class purposes). If you must make or receive a call during class, please leave the classroom quietly to avoid disrupting the lesson. In particular, use of a cell phone or other unauthorized electronic device during an exam or quiz will result in a zero grade on the exam. A second offense will result in a failing grade in the course.

**Students will not be allowed to leave and reenter the classroom during an exam for any reason, so please come prepared.**

## **Communication Policy**

MCC adheres FERPA regulations regarding communication with students. Go to [FERPA - http://www.morgancc.edu/legal-notices/notification-of-rights-under-ferpa/](http://www.morgancc.edu/legal-notices/notification-of-rights-under-ferpa/)

Your morgancc.edu e-mail address is the official means of communication between you and the college. If you have not done so, please go to the MCC home page to activate your e-mail account. The Newsfeed in D2L will contain Friday updates displaying what was covered during the week and a look ahead to the following week. Course announcements such as items to be printed and course adjustments will also be announce in the Newsfeed.

## **Legal Notices**

### **Notice of Non-Discrimination**

Morgan Community College prohibits all forms of discrimination and harassment including those that violate federal and state law, or the State Board for Community Colleges and Occupational Education Board Policies 3-120 or 4-120. The College does not discriminate on the basis of sex/gender, race, color, age, creed, national or ethnic origin, physical or mental disability, veteran status, pregnancy status, religion, genetic information, gender identity, or sexual orientation in its employment practices or educational programs and activities. Morgan Community College will take appropriate steps to ensure that the lack of English language skills will not be a barrier to admission and participation in vocational education programs.

For information regarding civil rights compliance or grievance procedures contact:

#### **Title IX Coordinator, Affirmative Action/Equal Opportunity Officer:**

Julie Beydler  
Director of Human Resources  
920 Barlow Road  
Fort Morgan, CO 80701  
(970) 542-3129  
[Julie.Beydler@MorganCC.edu](mailto:Julie.Beydler@MorganCC.edu)

#### **Deputy Title IX Coordinator:**

Susan Clough

Vice President for Administration and Finance  
920 Barlow Road  
Fort Morgan, CO 80701  
(970) 542-3127  
[Susan.Clough@MorganCC.edu](mailto:Susan.Clough@MorganCC.edu)

You may also contact the Office for Civil Rights, U.S. Department of Education, Region VIII, Federal Office Building, 1244 North Speer Boulevard, Suite 310, Denver, CO 80204, telephone (303) 844-3417.

### **MCC's Title IX Responsibilities**

Morgan Community College seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of sexual harassment/misconduct/assault we encourage you to report this. If you report this to a faculty or staff member, he or she must notify Julie Beydler, our College's Title IX Coordinator about the basic facts of the incident (you may choose whether you or anyone involved is identified by name). For more information about your options at Morgan Community College please go to: [Title IX \(http://morgancc.edu/titleix\)](http://morgancc.edu/titleix).

### **Mandated Reporters**

Our College is committed to preserving a safe and welcoming educational environment for all students. As part of this effort, I have an obligation to report certain issues relating to the health and safety of campus community members. I must report to the appropriate College officials any allegation of discrimination or harassment. Sexual misconduct, which includes sexual harassment, non-consensual sexual contact, non-consensual sexual intercourse, and sexual exploitation, is considered a form of discrimination.

In addition to reporting all discrimination and harassment claims, I must report all allegations of dating violence or domestic violence, child abuse or neglect, and/or credible threats of harm to yourself or others. Such reports may trigger contact from a College official who will want to talk with you about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual. If you would like more information, you may reach the Title IX/EO Coordinator at (970) 542-3129, email: [Julie.Beydler@morgancc.edu](mailto:Julie.Beydler@morgancc.edu) or in the HR office, Aspen 206. Reports to law enforcement can be made at the Fort Morgan Police Department or your local police department, Dispatch Phone number: (970) 867-5678 or if an emergency, dial 911.

If you would like a confidential resource, please contact S.A.R.A. (Sexual Assault Response Advocates) at (970) 867-2121.

Further information may be found on the College web site: [Title IX \(http://www.MorganCC.edu/titleix\)](http://www.MorganCC.edu/titleix).

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### **Deputy Title IX Coordinator**

Vice President for Administration and Finance  
Susan Clough  
920 Barlow Road  
Fort Morgan, CO 80701  
(970) 542-3127  
[Susan.Clough@MorganCC.edu](mailto:Susan.Clough@MorganCC.edu)

#### **Vice President of Student Success**

Kent Bauer  
920 Barlow Road  
Fort Morgan, CO 80701  
(970) 542-3111  
[Kent.Bauer@MorganCC.edu](mailto:Kent.Bauer@MorganCC.edu)

#### **Accreditation Statement**

Morgan Community College is accredited by The Higher Learning Commission

#### **Disability Services**

Morgan Community College complies with and fully supports Section 504 of the vocational rehabilitation act of 1973 with amendments of 1974 as well as the Americans with Disabilities Act (ADA) of 1990. "No qualified individual with a disability shall, by reason of such disability, be subjected to discrimination." Students have the responsibility to self-identify to the institution as a person with a disability or special need. Appropriate documentation must be provided to the ADA coordinator. Students of special populations may be eligible for "reasonable accommodations" so long as they meet and follow MCC policy and procedure. Go to [Disability Services \(https://www.morgancc.edu/get-started/disability-services/\)](https://www.morgancc.edu/get-started/disability-services/) for more information. Those wishing to seek accommodations must contact the ADA Coordinator at (970) 542-3111.

#### **Video or Audio Recording of Lectures**

Except where a student is entitled to make an audio or video recording of class lectures and discussions as an educational accommodation determined through the student's interactive process with college disability services, a student may not record lectures or classroom discussions unless written permission from the class instructor has been obtained and all students in the class as well as guest speakers have been informed that audio/video recording may occur.

A student granted permission to record may use the recording only for his or her own study and may not publish or post the recording on YouTube or any other medium or venue without the instructor's explicit written authorization.

Students with a disability are encouraged to contact the learning resources and support programs on each campus to arrange for accommodations and support services. Please visit our [Disability Services \(https://www.morgancc.edu/get-started/disability-services/\)](https://www.morgancc.edu/get-started/disability-services/) page for more information.

#### **Gainful Employment**

Important information about the educational debt, earnings, and completion rates of students who attended this program can be found on our [Gainful Employment](http://www.morgancc.edu/gainfulemployment/) page (<http://www.morgancc.edu/gainfulemployment/>).