

Augusta Technical College
Course Syllabus
MATH 1101 – Mathematical Modeling

CRN:	Instructor: Ms. N. Molik
Credits: 3 credits	Office Phone: 706 – 771 – 4076
Term:	Office Location: Room 223, 200 Building, Augusta
Class Location:	Office Hours:
Class Time:	Email: nmolik@augustatech.edu
Emergency Contact: 706 – 771 – 4111	Website: www.augustatech.edu/math/molik/
Course Website: www.augustatech.edu/math/molik/1101worksheets.htm	

Course Description: Mathematical Modeling (Prerequisite: Appropriate algebra placement test score.) Emphasizes functions using real-world applications as models. Topics include fundamental concepts of algebra; functions and graphs; linear, quadratic, polynomial, exponential, and logarithmic functions and models; systems of equations; and optional topics in algebra.

Competencies/Student Learning Outcomes:

After completing this section, the student will be able to:

Fundamental Concepts of Algebra

1. Demonstrate the concept of sets and set notation.
2. Find complements, unions, and intersections of sets.
3. Compute the value of expressions using the laws of exponents.
4. Simplify radicals and use them in arithmetic operations.
5. Perform arithmetic operations on polynomials.
6. Identify all factors of algebraic expressions.
7. Perform arithmetic operations on rational expressions.

Functions and Graphs

1. Graph first- and second-degree equations.
2. Define functions.
3. Graph functions.
4. Find sum, difference, product, and quotient of functions.

Linear Functions

1. Solve linear equations.
2. Solve rational equations with ratio and proportion when applicable.
3. Solve linear inequalities.
4. Construct linear models that describe real-world phenomena.
5. Solve and analyze linear models.

Quadratic Functions

1. Solve quadratic equations.
2. Construct quadratic models that describe real-world phenomena.
3. Solve and analyze quadratic models.

Polynomial Functions

1. Construct polynomial models that describe real-world phenomena.
2. Solve and analyze polynomial models.

Exponential Functions

1. Construct exponential models that describe real-world phenomena.
2. Solve and analyze exponential models.

Logarithmic Functions

1. Construct logarithmic models that describe real-world phenomena.
2. Solve and analyze logarithmic models.

Systems of Equations

1. Solve systems of linear equations with two unknowns.
2. Solve application problems involving linear systems.

Textbooks, Tools, and Supplies:

- A scientific calculator (preferably the TI-30XIIS) is required for this course.
- This course requires use of a pencil at all times, a straight edge/ruler, a binder that is at least 1 inch thick, and a notebook with pockets for worksheets and tests.
- (Optional) Rockswold, Gary K. (2005). College Algebra through Modeling and Visualization (4th ed.). Boston, MA: Addison Wesley

Evaluation and Grading:

Augusta Technical College Grading Scale

A	=	90-100	
B	=	80-89	
C	=	70-79	
D	=	60-69	
F	=	0-59	
WF	=	0-59	Signifies the student withdrew with a failing grade after mid-term. "WF" carries a grade point average of "0."
W			Signifies the student withdrew before midterm.
WP			Signifies the student withdrew after midterm with a passing grade.

Course Grade:

For this course, the following grading scale is used:

Tests/Projects: 75% of grade
Final Exam: 25% of grade

Tests include open-ended problems, which require students to show **all** of their work to receive credit, and various word/verbal problems relating to real-life problems in the various fields of work in which students are pursuing their higher education. Any projects will count as a test grade and will not be accepted late. Pop quizzes may be given at any time, many times at the very beginning of class, and will count as a test grade at the end of the semester. Pop quizzes will **not** be made up if missed. Don't be late!

There are **no** make-up tests or projects for any reason. Your lowest test grade will be dropped. If you miss a test, that will be the test grade you drop. Homework will only be collected if a day's notice is given in advance. In general, most homework is considered practice and will not be collected. If a homework assignment is collected, its completion or lack of completion will be factored into your grade by the addition or subtraction of points from your test average.

Work Ethics: A work ethics grade will be assigned in this course. Therefore, students are encouraged to apply appropriate work ethics in class using the following determining factors: attendance, productivity, punctuality, teamwork, character traits, leadership, personal organizational skills, communication, respect, confidence, and appearance. The instructor will monitor these skills and will document those situations in which students exceed or fail to meet these factors.

At mid-semester students will receive a rating that reflects these documented situations. If a student has been deficient in a certain area, the student will be given the opportunity to bring his or her performance up to industry standards before grades are issued at the end of the semester. The

work ethics grade will be placed on the student's permanent record. The work ethics grade does not affect the grade point average. The numerical scale for work ethics is as follows:

3 – Exceeds Expectations	1 – Needs Improvement
2 – Meets Expectations	0 – Unacceptable

Make-up Policy: There are no make-up tests; projects, take-home tests, and other items are not accepted late. Instead, your lowest test/project grade will be dropped.

Withdrawal/Drop Policy:

Attendance Policy: To complete this class successfully, students are required to participate in class, complete assignments in a timely manner, and attend all scheduled classes. Students are expected to arrive on time and remain in class for the entire session. Students are allowed to miss 10 percent of the class without penalty. Failure to follow the attendance policy may result in suspension or withdrawal from class. Withdrawal or suspension from a class may affect a student's present and future academic and financial aid status as well as the class work-ethics grade.

Student-Initiated Withdrawal from Course(s): If a student decides to drop the class, the student will need to withdraw officially from the class by completing and submitting a Schedule Change Form to the Financial Aid Office.

Instructor-Initiated Suspension or Administrative Withdrawal from Class: If a student misses more than 10 percent of the scheduled class sessions, the student may be suspended or administratively withdrawn from class.

However, since it is your responsibility to drop yourself from any class you stop attending; you may not get dropped from the class and may receive an F instead. Both of these cases may affect your financial aid status.

A student who has been suspended or administratively withdrawn for attendance reasons has the right to appeal to in writing to the Dean of Learning Support and General Education (Mr. John Richardson) and must remain in school during the appeal process. When the appeal process is completed, the final decision is made retroactive to the date of the original notice of suspension.

For additional information, refer to the *Augusta Technical College Student Handbook and Wellness Guide*.

Disabilities and Counseling Policy: If there is a student in this class who needs testing or classroom accommodations due to a disability, please meet with the instructor to discuss any testing or accommodation needs. Augusta Technical College has ADA coordinator/disability counselor services available to all students. Please contact the counseling and testing center, which is located on the second floor in the 1300 Building, at (706) 771-4067 or 4068 for additional details.

Career Services: Career Services offers assistance with resume and cover letter preparation, mock interviewing, career information, and a website of job leads from local employers. The website can be accessed by clicking the "Experience" logo on the Career Services webpage or through the URL <http://augustatech.experience.com/er/security/login.jsp>

Warranty: "If one of our graduates, who was educated under a standard program, and his or her employer agrees that the employee is deficient in one or more competencies as defined in the standards, Augusta Technical College will retrain that employee at no instruction cost to employee or employer."

Honor Pledge:

By attending classes at Augusta Technical College, you agree to abide by the honor code, which reads as follows:

It is my honor to be an Augusta Technical College student. I pledge to do honor to myself, my classmates, and my college by doing my best and by following the college's honor code. I will not dishonor myself or my college by lying, cheating, stealing, or doing harm to another person or property. I understand that following an honor code is a reflection of my work ethics which is important to my success on the job and in life.

Anti-Discrimination Policy: As set forth in its student catalog, Augusta Technical College does not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, political affiliation or belief, veteran status, or citizenship status (except in those special circumstances permitted or mandated by law).

Title IX/Title VI Coordinator: Mr. Randy Davis, Building 100, Room 129, 706-771-4081
ADA/Disabilities Coordinator: Ms. Karissa Wright, 2nd Floor of Building 1300, 706-771-4067

Tutoring Center: The Tutoring Center in the ITC is available every morning and some afternoons and is free of charge for students of Augusta Technical College. Their specific daily hours are posted on their door. They also are available by appointment, so please feel free to make an appointment if necessary.

Other Items of Note:

1. All cell phones and beepers should be **turned off or on vibrate** before class starts. Exceptions to this rule need to be discussed with the instructor prior to class time. Cell phones and beepers distract those who are trying to learn and especially those of us who have learning disabilities or ADD/ADHD, so please be considerate of those around you and take care of this before class starts. Texting during class will result in you being asked to leave the classroom.
2. All computers and other equipment in the classroom are property of either Augusta Technical College or me. Unless I have given an assignment that requires the computers or other equipment, those items are off-limits to students during class time. Anyone not respecting this fact may be asked to leave the classroom and will be marked absent for the day. Any note-taking during class on personal laptops or other electronic devices must be cleared with me ahead of time. Repeated violations may result in suspension from the class.

MATH 1101 Homework Assignments:

Problems from the workbook will be assigned as homework/practice problems.

Other problems from the Rockswold book: (Problems in the book marked with a small graphing calculator next to them require a graphing program)

Data, Sets, Relations, and Functions

2 Sets Worksheets – Also available on <http://www.augustatech.edu/math/molik/1101worksheets.htm>

1.2 61-67 odd, 81-85 odd, 87 & 89 a,c,d only, 91

1.3 5-13 odd, 19, 21, 23-31 odd, 77-82 all, 87-92 all

Lines and Linear Models

1.4 1-23 odd, 31-35 odd, 69, 70

2.1 5-9a,b odd, 11-23 odd, 25-28 all

2.2 11-41 odd (In standard form or slope-intercept form)

6.1 27-45 odd; **6.2** – 5-27 odd

2.3 7-29 odd, 31-41 odd (part a only); 57-63 odd

5.2 41, 43, 45, 51, 85-91 odd, 121, 122, 133

2.4 13-37 odd; 57-67 odd

Models: **2.1** – 41, 43, 55; **2.2** – 79, 81, 85 (put b in standard or slope-intercept form), 87; **2.3** – 79, 83, 86, 93, 109 ; **2.4** – 89, 91, 97; **6.1** – 85, 91; **6.2** – 71, 77

Preliminary Algebra

- R3 21-71 odd, 73-99 alt. odds; **4.7** – 1–7 odd
- R4 9-19 odd, 27-35 odd, 43-103 odd
- R5 1-57 odd, 59-65 odd, 71, 77-89 odd, # 103, 107, 109, 115, 117, 119
- R6 1-11 odd, 15–29 odd, 45-61 odd
- 5.1 13, 15, 21, 23, 27, 61-64 all, 65, 69, 71, 73, 79, 99

Quadratic Functions and Models

- 3.1 17-23 odd, 25-37 odd, 59-75 odd,
- 3.4 41-44 all, 46, 47
- 3.2 1-23 odd
- Models: **3.1** – 81, 83; **3.2** – 97, 98, 105, 107

Polynomial Functions and Models

- 4.1 11-15 odd, 39, 41, 43, 63-66 all (use graphing program)
- 4.2 3-29 odd
- 4.3 97-121 odd (parts a and b only),
- Models and Graphs: **4.1** – 117 a & c, 119; **4.2** – 83; **4.3** – 123-127 odd, 131, 132, 135, 136a, c, 137

Exponential and Logarithmic Functions and Models

- 4.7 1-21 odd, 33, 35, 45-49 odd
- 5.3 1-15 odd, 25, 27, 28, 29-33 odd, 37, 41, 43-51 odd,
- 5.4 19-35 odd, 69-87 odd
- Models: **5.3** –69, 71, 73, 79, 87, 89, 93; **5.4** –113, 116, 121, 123a, c

Schedule is subject to change.

Augusta Technical College does not discriminate on the basis of race, color, national origin, gender or disability. For information on ADA/504, contact the ADA/504 coordinator, Karissa Davis Wright at 706-771-4067 in the 1300 Building.