MATHEMATICAL MODELING AND PROBLEM SOLVING
The University of Toledo
Mathematics & Statistics Department, College of Natural Sciences and Mathematics
MATH1200-0XX, CRN XXXXX

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Instructor:	(Insert Name]	Class Location:	(Insert Building/Room)
Email:	(Insert E-mail Address)	Class Day/Time:	(Insert Days/Time)
Office Hours:	(Insert Days/Time)	Credit Hours:	4
Office Location:	(Insert Building/Office Number)		
Office Phone:	(Insert Phone Number)		
Term:	(Insert Semester and Year)		

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COURSE DESCRIPTION
Mathematical modeling of data using linear, quadratic, rational, and radical functions in their numerical, symbolic, graphic, and verbal forms. Problem solving methods and strategies will be emphasized. Course is not applicable toward the undergraduate mathematics major requirements. Prerequisite: Satisfactory placement test score or satisfactory ACT score. Math core course.

LIST OF TOPICS
> The material covered in the course corresponds to material in Chapters 1-9 of *Algebra for College Students*, 7th edition, Blitzer.
> In general, students will be engaged in the various topics listed below through lectures, interactive computer activities, and group and individual written activities.
> An emphasis will be placed on problem solving throughout the course.

- Problem solving strategies and techniques
- Introduction to functions
- Linear functions
- Systems of Equations
- Quadratic functions
- Square root functions
- Rational functions
- Exponential and logarithmic functions

STUDENT LEARNING OUTCOMES
The successful MATH1200 student should be able to:
- ***Review basic skills and Real Number Operations:*** Algebraic Expressions, The real number system, Operations with real numbers, Solving linear equations, problem solving, integral exponents.
- ***Understand and work with functions including the domain and range:*** Functions, Graphs of Functions, linear Functions and Slope, The point slope form of a line. Composition. Domain and Range.
- ***Solve simultaneous systems of equations by two methods, and to apply:*** Systems of linear equations, Problem solving and applications of systems of equations, Systems of linear equations in 3 variables.
- ***Understand basic inequalities and generate graphical representations of their solutions:*** Solving linear inequalities, linear inequalities in 2 variables.
- ***Factor numerous forms of polynomials, and apply the concept to solve equations:*** Factoring, greatest common factor, trinomials, special forms, polynomial equations.
- ***Identify and solve quadratics equations:*** Square root property, completing the square, quadratic formula, graphs of quadratics functions.
- ***Identify and simplify radical expressions and solve radical equations:*** Radical expressions, radical equations.

- ***Understand and work with rational expressions:*** Rational Expressions, Adding and Subtracting Radical Expressions, Rational Equations, and Applications.
- ***Identify different types of functions, Solve expo and log equations:*** Exponential functions, Composition of functions, logarithmic functions, exponential and logarithmic equations.

PREREQUISITES
Satisfactory ACT or SAT Math score or satisfactory placement test score. To be successful in this class, you should be comfortable adding, subtracting, multiplying and dividing signed numbers and fractions, and familiar with the use of variables.

REQUIRED MATERIALS
- You do not need to purchase anything for this course. The text/course materials will be provided and the cost ($111.49) is included in your course fees. This course includes an e-text copy of *Algebra for College Students* 7th edition, Blitzer, Pearson/Prentice Hall.
- Once you have registered for Math 1200, on the first day of class you will have full access to the online course content.
- Scientific calculator (non-graphing, non-programmable). **Graphing calculators and cell phones are not allowed to be used on tests or the final exam.**
- 3-Ring binder/notebook/folder for the organized taking/keeping class notes, and written assignments.

COURSE SYLLABUS & SCHEDULE
Along with this syllabus, a course schedule is posted within your Mylabsplus course at:
Course Tools > Document Sharing > Syllabus and Schedule.

VIDEO LECTURES
Math 1200 will be using a "hybrid flipped" classroom model. This means that much of your required lectures will be in video format and supplemented by your instructor. You will be required to watch these lectures as homework, thus allowing   more class time for more in-depth, hands-on, group, or review activities. Additional lectures may be posted on blackboard or within the class site. Each video lecture is accompanied with a short quiz. You must complete this quiz 75% correctly in-order-to get into that section's homework. Reminder: These videos are to be watched before the class meeting.

UNIVERSITY POLICIES:

POLICY STATEMENT ON NON-DISCRIMINATION ON THE BASIS OF DISABILITY (ADA)
The University is an equal opportunity educational institution. Please read The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.

ACADEMIC ACCOMMODATIONS
The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the Student Disability Services Office (Rocket Hall 1820; 419.530.4981; studentdisabilitysvs@utoledo.edu) as soon as possible for more information and/or to initiate the process for accessing academic accommodations. For the full policy see:
http://www.utoledo.edu/offices/student-disability-services/sam/index.html

ACADEMIC POLICIES:

STUDENT PRIVACY

Federal law and university policy prohibits instructors from discussing a student's grades or class performance with anyone outside of university faculty/staff without the student's written and signed consent. This includes parents and spouses. For details, see the "Confidentiality of student records (FERPA)" section of the University Policy Page at http://www.utoledo.edu/policies/academic/undergraduate/index.html

MISSED CLASS POLICY

If circumstances occur in accordance with "The University of Toledo Missed Class Policy" (found at http://www.utoledo.edu/policies/academic/undergraduate/index.html) result in a student missing a quiz, test, exam or other graded item, the student must contact the instructor in advance by phone, e-mail or in person, provide official documentation to back up his or her absence, and arrange to make up the missed item as soon as possible.

ACADEMIC DISHONESTY POLICY

Any act of academic dishonesty as defined by the University of Toledo policy on academic dishonesty (found at http://www.utoledo.edu/dl/students/dishonesty.html) will result in an F in the course or an F on the item in question, subject to the determination of the instructor.

GRADING POLICY & GRADING SCALE

Assignment Type	Overall % Value
Attendance Quizzes	8%
Written Assignments	12%
Homework	20%
Final Exam	20%
Tests	40%

Grade	-	A-F	+
A	90-92	93-96	97-100
B	80-82	83-86	87-89
C	70-72	73-76	77-79
D	60-62	63-66	67-69
F		0-59	

ATTENDANCE (8%)

Attendance will be taken every class day via online quizzes. Your instructor can consider missing more than 20% of a class period an absence. Missing 2 or more consecutive classes, or missing every other day, may lead to the deactivation of your MyLabsPlus account. If your account is deactivated, you will be unable to access your coursework until you have a conference with your instructor, and/or return to class. No attendance credit is given for sleeping in class. Leaving class prior to dismissal is grounds to revoke your attendance for that day.

Attendance Quizzes 1-54 (8%)

Each class day you will have an attendance quiz to take. These are 1-2 question long quizzes. Many of the questions will also appear on your exams. You must be in class to take these quizzes. You may miss up to 4 without penalty to account for any excused absences.

WRITTEN ASSIGNMENTS (12%)

These may be assigned as an individual or group in-class activity, or as an out-of-class assignment. They can be found at: **Course Tools > Document Sharing > Written Assignments.** And should be printed out each Monday they are available. Due dates will be established by your instructor. Makeups for these assignments may be accessed through the course website. Penalties may be assigned for late submissions.

Notebooks should be well organized and contain classroom notes, graded written assignments, and clearly written work associated with homework and quizzes. You may want to include printed copies of the Lecture Notes that are posted at: **Course Tools > Document Sharing > Lecture Notes**. **Notebooks** will be checked during your final exam, and count as a written assignment

HOMEWORK (20%)

Homework will be assigned each week and due on Monday of the following week. All homework problems may be worked as often as needed to master the material. Interactive solutions for the homework problems and different forms of tutorials are available online. Not all homework sets are equal. Some types are worth more than others:

Skill Check Homework: (<1%)

Preliminary weekly assignment that needs to be completed at least 75% prior to attempting regular chapter assignments.

Video Lectures: (<1%)

Videos must be watched prior to class discussion. Each homework chapter assignment has a corresponding video.

Chapter Homework: (3%)

These assignments correspond to the video lectures. You will be tested over this material.

Weekly Mix: (3%)

These assignments are a mix of the material from the current week and prior weeks. All test questions come from these. They become available each Wednesday.

Practice Tests (1-4,F) (3%)

These will be available a week prior to each test and will be counted as a homework assignment. All Practice tests will become available the Thursday the previous week, and will be due the Monday after the test.

Scavenger Hunt Problems (10%)

These are challenging questions with no partial credit. They are available at the start of the semester. Their due dates are highlighted on the schedule. There is no partial credit for these.

TESTS & FINAL (60%)

There will be 4 semester tests, plus a comprehensive final exam. Tests and final exams can only be taken in the classroom under the instructor's supervision or under special circumstances in a Testing Center, scheduled by the instructor. Only non-graphing, non-programmable calculators may be used on all tests and the final exam. Cell phones **may not** be used on all tests and the final exam. Use of a cell phone in **any** capacity during a test or the final may result in a grade of 0% for that test or announced test day, or a grade of 0% may be posted for the missing test. At the end of the semester, your Final Exam grade may be substituted for your lowest test score. According to The University of Toledo's policy, all final exams need to be taken during Final Exam Week.

QUIZZES MISC (0%)

Practice Test 1-4,F: (0%)

To help give you a feel of the test format, these are available 1 week prior to your exam.

-Skills Check Quizzes 1-3: (0%)

Weekly quizzes made available 3 times. These are required to be completed before starting your regular weekly homework, and determine what is on your weekly skills check homework.

EXTRA CREDIT:

Logging at least 3 hours before each semester exam at either the study tables or the L.E.C. will award you 7.5% bonus on each exam. This can boost your grade by 3% overall.

CLASSROOM RULES AND ETIQUETTE

- The classroom is to be used **only for work on Math1200**.

- No text messaging, facebooking, googling, emailing, game playing, or working on assignments for other classes. If you are caught texting, you can be forced to leave the classroom
- **No food** in the classroom computer lab, this includes before and after class.
- **Drinks** need to be in capped bottles and off the tabletops.
- All electronic devices and cell phones need to be turned off and out of sight during class and tests.
- **Cell phones** may not be used as calculators, and need to be turned off before entering the room.
- The use of cell phones needs to be restricted to outside the classroom, including between classes.
- Be considerate of your classmates and instructor in asking and answering questions, entering, leaving or moving around the classroom.
- Students arriving early for class should wait in the hallway until the previous class has left the room.
- If you fail to comply with any of these rules, you may be asked to leave the classroom.

SOME ADVICE FOR SUCCEEDING IN THIS CLASS
- Attend class regularly and **complete your assignments by the due dates**.
- Schedule sufficient time to devote to this course outside of class.
- Don't hesitate to ask questions, either in class or during your instructor's office hours. If you can't make it during those office hours, make an appointment or make contact by email.
- Get help at the first sign of confusion. Don't wait.
- Study with fellow students. Take turns explaining the material to each other. Teaching someone else is the best way of learning.
- Bring a good **non-graphing scientific calculator** to class every day.

Podcast and Media Use Policy: Media produced by the course instructor are solely for class use by students currently registered for the course, and under no circumstances can they be posted, linked to, or made available for distribution or copying to any persons, institutions, or servers (for example, no portion of them may be downloaded and posted on YouTube or sent to friends). This includes media that appears on the course site and in VoiceThread. As the author of these teaching materials the instructor or university holds the copyright (though not to the commercial artworks contained within them), and the only authorized use by students is for the purposes of the course. Violating this policy constitutes a serious infraction of UT's computer use policy and may result in consequences up to and including expulsion from the University and legal action (both criminal and civil) from the various rights holders whose copyrights you may have infringed.

IMPORTANT DATES
- **FINAL EXAM:** _____
- The last day to **ADD/DROP** classes is: _____
- The last day to **WITHDRAW** from Fall Semester is: _____

Note: Instructors cannot withdraw students from class. Any student who has not withdrawn from class by the **withdrawal deadline** will receive a letter grade for this **4 credit hour** course. The last day to drop or add this course is the end of the second week of classes. The last day to withdraw from this class with a grade of "W" is the Friday of the tenth week of classes.

STUDENT SUPPORT SERVICES
- Your instructor is available for extra help during office hours.
- Free math tutoring on a walk-in basis is available in the **Math Learning and Resources Center** located in Rm B0200 in the lower level of Carlson Library (phone ext 2176). The Center operates on a walk-in basis. MLRC hours can be found at http://www.math.utoledo.edu/mlrc/MLRC.pdf

Topics to be covered: *Learning Objectives covered by that topic follow in italics*

Chapter 1, Sections 1-6	Algebraic Expressions, The real number system, Operations with real numbers, Solving linear equations, problem solving, integral exponents. ***Review of basic skills and Real Number Operations***	8 hours
Chapter 2, Sections 1-5	Functions, Graphs of Functions, linear Functions and Slope, The point slope form of a line. Composition. Domain and Range. ***Understand and work with functions including the domain and range.***	6 hours
Chapter 3, Sections 1-3	Systems of linear equations, Problem solving and applications of systems of equations, Systems of linear equations in 3 variables. ***Solve simultaneous systems of equations by two methods, and to apply.***	4 hours
Chapter 4, Sections 1, 4	Solving linear inequalities, linear inequalities in 2 variables. ***Understand basic inequalities and generate graphical representations of their solutions***	3 hours
Chapter 5, Sections 3-7	Factoring, greatest common factor, trinomials, special forms, polynomial equations. ***Factor numerous forms of polynomials, and apply the concept to solve equations.***	5 hours
Chapter 8, Sections 1-3	Square root property, completing the square, quadratic formula, graphs of quadratics functions. ***Identify and solve quadratics equations.***	7 hours
Chapter 7, Sections 1, 6	Radical expressions, radical equations. ***Identify and simplify radical expressions and solve radical equations.***	3 hours
Chapter 6, Sections 1, 2, 6, 7	Rational Expressions, Adding and Subtracting Radical Expressions, Rational Equations, and Applications. ***Understand and work with rational expressions.***	5 hours
Chapter 9, Sections 1-5	Exponential functions, Composition of functions, logarithmic functions, exponential and logarithmic equations. ***Identify different types of functions, Solve expo and log equations.***	5 hours