



## **MATH 361-1SE/4RE/7RE**

# **Mathematical Modeling of Science for Middle School I**

COURSE SYLLABUS: Fall 2023

TR 12:30-1:45pm BINB301 / MPLX213 / Navarro BC322

### **INSTRUCTOR INFORMATION**

Instructor: Dr. R. Cavender Campbell

Office Location: Binnion 303B

University Email Address: robert.campbell@tamuc.edu

Office Phone: 903-468-8660

Office Hours: TWRF 9:00-10:30am, MW 1:00-2:00pm, or by appointment (Zoom available)

Preferred Form of Communication: **Email**

Communication Response Time: Same or Next Business Day

### **COURSE INFORMATION**

#### **Textbook**

Stewart, J., Redlin, L., & Watson, S. (2009). Precalculus: Mathematics for Calculus. Belmont, CA: Brooks/Cole Cengage Learning.

#### **Course Description**

MATH 361 – Mathematical Modeling of Science for Middle School I – Hours: 3

Mathematics will serve as the basis of the course and the following topics will be covered: Mathematical modeling, transformation of functions, data analysis skills, linear models, exponential growth and decay, logarithmic functions, logistic models, power and polynomial models, inverse and direct variation, periodic models and trigonometric functions.

Prerequisites: "C" or better in MATH 1351 or 351.

#### **Course Format**

The course is planned for a multi-site format. Students should attend at their registered campus. Class meetings will be distributed via a video communication platform (typically Zoom) to both the Metroplex and Navarro campuses. This communication will be two-way allowing the students to interact with the professor and other students at each campus. Any students unable to attend in person should alert the professor to the situation so that an appropriate accommodation can be made. Both the instructor and students should be flexible to adapt to changing conditions.

*The syllabus/schedule are subject to change.*

## **Student Learning Outcomes**

1. Students will demonstrate proficiency in the use of mathematics to structure their understanding of and investigate questions in the world around them.
2. Students will demonstrate proficiency in treating mathematical content at an appropriate level.
3. Students will demonstrate competence in the use of numerical, graphical, and algebraic representations.
4. Students will demonstrate the ability to interpret data, analyze graphical information, and communicate solutions in written and oral form.
5. Students will demonstrate proficiency in the use of mathematics to formulate and solve problems.
6. Students will demonstrate proficiency in using technology such as handheld calculators and computers to support their use of mathematics.

## **Student Assessment Outcomes**

1. Critical Thinking: The above learning objectives will be assessed for critical thinking in labs and other classroom activities.
2. Written, Oral, & Visual Communication: Students will be assessed on written, oral, and visual communication skills on their quizzes, exams, labs, and lab jigsaw activities.
3. Empirical and quantitative reasoning: All assessments in this course will contain a quantitative reasoning and empirical computation component.

## **Course Learning Outcomes**

1. Demonstrate an understanding of the connections between the geometric, graphic, numeric, and symbolic representations of various functions.
2. Recognize, analyze, describe, and represent data in various functions.
3. Understand the effects of transformations on graphs of functions.
4. Understand rates of change and how they apply to different physical scenarios and data.
5. Judiciously use appropriate technology to achieve these outcomes.

## **COURSE REQUIREMENTS**

Students should complete assignments by the due dates and clearly communicate any mathematical ideas necessary to demonstrate understanding of the topics.

Instruction will include lectures and demonstrations along with group assignments and discovery style activities. Students should attend all class meetings and communicate with the instructor should difficulty with the material arise.

Attendance at all scheduled classes is expected and will be tracked by the instructor. The student is responsible for ensuring they are counted present for the day by arriving punctually to the start of class at their registered campus.

A graphing calculator (e.g., TI-84) or a computer algebra system (e.g. Mathematica) is useful but not required for this course. Graphing calculators will be allowed on tests and the Final Exam.

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## GRADING

Final grades in this course will be based on a total points system:

**A: 800 – 710      B: 709 – 620      C: 619 – 530      D: 529 – 440      F: 439 – 0**

The instructor reserves the right to reward students for continuous hard work.

The grade will be composed of:

Teaching Assignment – 100 points

TEKS Write-Ups (2) – 20 points each = 40 points

Homework and Formative Assessments – 140 points

Quizzes (6) – 20 points each = 120 points

Tests (2) – 100 points each = 200 points

Final Exam – 200 points

### Assessments

**Teaching Assignment:** You will present an activity relating to course content toward the end of the semester. The content of the presentation should promote depth in your understanding of your topic. Grading rubrics, examples, and instructions will be distributed. Your presentation and activity will be worth 100 points.

**TEKS Write-ups:** With each unit test you will identify related skills in the grades 4-8 mathematics TEKS for the content being tested. An explanation of the connections and a write-up of notable applications will be required. Each of the two write-ups will be worth 20 points.

**Homework:** Homework assignments will be for practice and an opportunity to demonstrate understanding of the material. I encourage you to discuss homework assignments with your classmates, but all work that you turn in must be your own. Any work violating the university's guidelines for academic honesty (e.g. plagiarism, cheating, copying, etc.) will receive a grade of zero. Assignments will be submitted through D2L.

**Formative Assessments:** There will be additional assignments given during the semester. Group assignments may be completed with group collaboration. The assignments will provide greater depth for certain concepts and techniques in Algebra. Individual assignments may also be included to help the instructor determine the direction of further instruction.

**Homework and Formative assessments** will count up to 140 points in the final grade.

**Quizzes:** There will be six quizzes worth 15 points each. Quizzes and tests will have similar problem types, but the shorter format will allow the professor to see the students' progress on individual concepts. Quizzes will be open notes and occur during class time. Students attending at remote sites will see quizzes through Zoom and work will be submitted via D2L.

**Tests:** You will take two tests each worth 100 points each. Each test combines material from several sections in the textbook. The exams will have objective, short answer, and free response style questions. Tests will take place during class time, remote sites

**Final Exam:** You will take a comprehensive final exam worth 200 points. The format will be substantially the same as the unit exams. The final exam will be conducted in the same manner as the two tests.

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# TECHNOLOGY REQUIREMENTS

## LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

[https://documentation.brightspace.com/EN/brightspace/requirements/all/browser\\_support.htm](https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm)

## ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu).

**Note:** Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

## COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Please use email or visit the instructor during office hours. The instructor will make every effort to respond by the next business day at the latest. You can also visit with the instructor before or after class, but meetings during this time may be cut short to help all students.

### Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here: <https://community.brightspace.com/support/s/contactsupport>

### Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced as soon as practical.

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## **COURSE POLICIES**

Missed tests will not be made up after the grades have been returned to the class, but documented absences will be accommodated through other means agreed upon with the instructor. Tests may be taken early if an approved absence is anticipated and a time arranged with the instructor. Tests and the Final Exam will be conducted at each site. Prompt arrival at test time will maximize available time and improve performance.

A missed quiz can be made up during the professor's office hours until the next quiz or test. Should a documented need arise due to multiple absences it will be considered on a case-by-case basis.

Personal electronic devices and laptops will not be allowed during exams or quizzes. Causing a distraction or creating a barrier to learning for other students will be grounds for banning of device use, but typically devices will be allowed during classes.

### **University Specific Procedures**

#### **Student Conduct**

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

#### **Academic Integrity**

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

#### **Artificial Intelligence**

Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

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## **TAMUC Attendance**

For more information about the attendance policy please visit the Attendance webpages.

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

## **Nondiscrimination Notice**

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

## **Campus Concealed Carry Statement**

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

## **Counseling Services**

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit [www.tamuc.edu/counsel](http://www.tamuc.edu/counsel).

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## Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

### Office of Student Disability Resources and Services

Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: [studentdisabilityservices@tamuc.edu](mailto:studentdisabilityservices@tamuc.edu)

Website: [Office of Student Disability Resources and Services](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

## COURSE OUTLINE / CALENDAR

8/29	Syllabus & Transformations of Functions	
9/5	Polynomial Functions	
9/12	Rational Functions	September 15 Quiz 1
9/19	Exponential Functions	September 22 Quiz 2
9/26	Logarithmic Functions	September 29 Quiz 3
10/3	Review & Test 1	<b>October 5 Test 1</b>
10/10	Angles & Trigonometry	
10/17	Unit Circle Trigonometry	
10/24	Right Triangle Trigonometry	October 24 Quiz 4
10/31	Graphing Trigonometric Functions	November 2 Quiz 5
11/7	Polar Coordinates	November 9 Quiz 6
11/14	Review & Test 2	<b>November 16 Test 2</b>
11/21	Polar Equations & Thanksgiving	<b>November 23 Thanksgiving</b>
11/28	Parametric Equations & Conic Sections	Nov. 30 Teaching Assignments
12/5	Remaining Topics & Final Review	
12/14	<b>Final Exam: 10:30am – 12:30pm</b>	<b>December 14 Final Exam</b>

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