Mathematical Models with Applications A v8.0 – Syllabus

Course Name

MTHMOD-A

Mathematical Models with Applications v8.0– Semester A

Course Information

This is the first semester of this two-semester course.

Mathematical Models A will apply math and problem-solving skills to everyday, real-world scenarios involving money. Students will use algebra to understand how money is earned, spent, and saved. Students will discover valuable skills to make them savvy and conscientious consumers in today's global market.

Students will travel through periods of life and explore how money can shape their options. They will learn about earning, saving, and spending so that they can make their money work for them! They will explore different career paths and education options. They will make sense of taxes, insurance, and income. They will buy their first car, rent an apartment, or get a mortgage. They will see how smart shopping at the grocery store and sticking to a budget can lead to a dream vacation! Students will learn to wisely invest and manage money all the way through their retirement years.

Students will also explore algebra and its applications in art and music through a project-based learning opportunity. Students will apply trigonometric ratios and their experience with algebraic equations and functions to model periodic behavior and structure in music.

Course Delivery Method

Online

Contacting Your Instructor

You may contact your instructor using your Canvas Inbox. Technical support is available 24/7 at TTU K-12.

Course Topics

After completing this course, the students should have increased knowledge of:

- use trigonometric ratios and functions through technology to model periodic behavior in art and music
- use geometric transformations, proportions, and periodic motion to describe mathematical patterns and structure in music
- use experiments to determine the reasonableness of a theoretical model

Textbook and Materials

No textbooks required. All content is within Canvas.

Materials

- Desmos Graphing Calculator

Technical Requirements

- Internet access – preferably high speed (for accessing Canvas)
- browser (we recommend Chrome)
- supported browser plugins and settings
  The following plugins and settings may be required to use our courses.
  - JavaScript enabled
  - Cookies enabled
  - Java installed
- Email
- Printing capabilities
- Adobe Reader (download from Adobe)
- Audio and video capabilities (for watching/listening to course content)
- PDF app (free options available)

Technical Skill Requirements

Be comfortable with the following:

- accessing online learning materials via Canvas
- Internet search engines and browsers (we recommend Chrome)
- uploading assignments into Canvas (there will be instructions for uploading assignments)

Course Pacing

This course is designed to be completed in 18 weeks.

- Print this guide and use a calendar to fill in your goal dates for completing each Module.
- To achieve success, students are expected to submit work in each course weekly.
- Students can learn at their own pace; however, "any pace" still means that students must make progress in the course every week.
- Post the pace guide in a place where you and your Parent or Guardian will see it every day (on the refrigerator or next to the computer). Give yourself a check every time you complete a task, and celebrate your efforts!

Note: when you access some lessons, the numbering you see inside the lesson may differ from the course numbering. Please reference the course numbering as seen here and in Canvas.

Weeks	Lessons	Due Date *(you write this in)*
1-4	Checkpoint 1 01.00 Teenage Years Introduction 01.01 Earning Money 01.02 Banking 01.03 Spending Money 01.04 Car costs 01.05 Teenage Years Practice Exam *01.07 Teenage Years Exam	
5-8	02.00 Cost of Living Introduction 02.01 Moving Out 02.02 Bills, Bills, Bills 02.03 Smart Shopping 02.04 Saving Money Checkpoint 2 02.07 Cost of Living Discussion-Based Assessment	
9-12	03.00 Home Sweet Home Introduction 03.01 Credit Score 03.02 Renting Versus Buying 03.03 Mortgage Costs 03.04 Home Renovations 03.05 Home Sweet Home Practice Exam *03.07 Home Sweet Home Exam	

Weeks	Lessons	Due Date *(you write this in)*
14-16	04.00 Retirement Introduction 04.01 Taxes 04.02 Retirement Income 04.03 Retirement Living 04.04 Retirement Travel Checkpoint 3 Final Project Preview: Mathematical Music Project – Part 1 04.07 Retirement Discussion-Based Assessment	
17	***Mathematical Music Project – Parts 1-4**	
18	Floating Vacation Week	

Course Credit

Your grade will be calculated as follows:

- formative assessments (50%)
- summative assessments (20%)
- summative final exam (30%)

Assignments are labeled as “summative” or “formative” under Grades in Canvas.

Course Completion and Extensions

- Students may not complete the course in less than 30 days.
- All courses expire 180 days after the enrollment date.

Academic Integrity

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

“Scholastic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

Artificial Intelligence (AI) Use Policy

This policy covers any generative AI tool, such as ChatGTP, Elicit, Photo Math, etc. This includes text and artwork/graphics/video/audio, etc.

All work submitted in this course must be your own. You may not use artificial intelligence tools to complete your assignments in this course.

If an instructor suspects that an assignment is not the work of the student, it will receive a score of zero. The instructor will message the student or provide feedback on the assignment indicating the need to schedule a one-on-one video conference, during which the student will be required to demonstrate their skills or knowledge through an alternative or mutually agreed-upon assignment. The grade of the alternate or agreed upon assignment will be determined at the instructor's discretion with the highest possible score being 70%.

If it is determined that a student has violated final exam directions on Final Exam A or CBE Set 1, the exam will be scored as zero. The student may take Final Exam B or CBE Set 2 with the highest possible score being 70%.

The incident will be reported to Texas Tech K-12 Administration and documented in the student's file. Continued violations of Texas Tech University's Academic Integrity Policy will result in the removal of the student from the program.

Student/Parent Expectations

You will be expected to log into the Canvas course regularly to be aware of possible announcements/reminders and to pace your student's progress in the course.

The following are prohibited while using the Canvas interface:

- spamming;
- hacking; and
- using TTU or Canvas email for commercial purposes;

Inappropriate behavior shall result in consequences ranging from a request to correct the problem, to removal from the course or even the university, depending on the severity of the behavior. Disciplinary actions will be taken according to the TTU K-12 Student Handbook.

Communication

- You can expect a reply from your instructor within 2 business days.
- Use the Canvas Inbox for sending messages to your instructor.

Submitting Assignments

You will submit all assignments through Canvas, rather than by mail or email.

Technical Difficulties

Getting Help

For student assistance with Canvas, visit TTU K-12 Support.

Computer Problems

A working computer is necessary for online coursework. Computer problems will not be accepted as a valid reason for failure to complete course activities within the allotted time frame. Identify a second computer, before the course begins, that you can use if you experience computer problems.

Server Problems

When the Canvas server needs to be taken down for maintenance, the Canvas administrator will post an announcement in your course informing you of the time and date. If the server experiences unforeseen problems, your course instructor will notify you.

Lost or Corrupted Files

You must keep/save a copy of every project/assignment on an external disk or personal computer. In the event of any kind of technology failure (e.g., Canvas server crash or virus infection, students' own computer problems, loss of files in cyberspace, etc.) or any disputes, the instructor may request or require you to resubmit the files. In some instances, the instructor may need to open another attempt within Canvas, so communication with your instructor is critical in these circumstances.