

Course Description

MATH 140 Mathematics for Business and Social Sciences (MATH 1324), Credits 3.3

Lecture Hours: Application of common algebraic functions, including polynomial, exponential, logarithmic and rational, to problems in business, economics and the social sciences; includes mathematics of finance, including simple and compound interest and annuities; systems of linear equations; matrices; linear programming; and probability, including expected value. Only one of the following will satisfy the requirements for a degree: Math 140 and Math 168.

Course Prerequisites

Prerequisite: High school Algebra II and Geometry.

Special Course Designation

This is a [CORE curriculum course](#) in Mathematics equivalent to MATH 1324.

Course Learning Outcomes

Upon successful completion of this course, students will:

- Apply elementary functions, including linear, quadratic, polynomial, rational, logarithmic, and exponential functions to model and solve real-world problems.
- Solve mathematics of finance problems, including the computation of interest, annuities, and amortization of loans.
- Apply basic matrix operations, including linear programming methods, to solve application problems.
- Demonstrate fundamental probability techniques and application of those techniques, including expected value, to solve problems.
- Apply matrix skills and probability analyses to model applications to solve real-world problems.

Core Objectives

Critical Thinking

- Students will carefully examine and interpret statements to determine equivalent mathematical notation and/or equations.
- Students will think logically in order to set up a system of equations and solve a word problem.
- Students will analyze given information to set up a linear programming problem, including a system of linear inequalities.
- Students will use inquiry to determine if a solution exists to a linear programming problem.
- Students will understand how to determine the probability of an event and apply this to real-world applications.

- Students will understand the difference between simple and compound interest and when to use each.

Communication Skills

- Students will express mathematical concepts both abstractly with equations and in writing.
- Students will exhibit functions, as well as solutions to linear inequalities, graphically.
- Students will explain why a matrix operation is possible or not, and interpret the meaning of the entries of the resulting matrix when the operation makes sense.
- Students will solve linear programming problems graphically and with matrices.
- Students will answer questions during lecture concerning topics discussed in class.

Empirical and Quantitative Skills

- Students will develop business-related mathematical models from given data, such as cost, revenue, profit, supply, demand, or depreciation.
- Students will create empirical probability distributions based on a given set of data.
- Students will use statistics (expected value) to make informed conclusions about real-world problems, such as determining the premium for an insurance policy.
- Students will use data on business resources and constraints to set up and solve linear programming problems.
- Students will analyze financial information to make decisions regarding everyday applications, such as loan payments, annuities, amortizations, or sinking funds.

Textbook and/or Resource Materials

Textbook

Mathematics for Business and Social Sciences by Kathryn Bollinger and Vanessa Coffelt. You can access this book for free from <https://oaktrust.library.tamu.edu/handle/1969.1/188687>

WebAssign Access*

WebAssign will be used for homework in this class. To use WebAssign, you must purchase access through the bookstore or online through WebAssign.

iClicker*

The iClicker system will be used regularly throughout the semester to administer various types of assessments. To participate, you may use either a physical remote (iClicker+ or iClicker2) or the iClicker Student Mobile App. iClicker assessments may be given at any point during class, so it is very important that you arrive on time and bring your designated iClicker device each day. More information regarding the iClicker system, including instructions for how to register your iClicker device, are posted in Canvas.

Calculator*

A TI-83 (any version), TI-84 (any version) or the TI-Nspire (non-CAS version) calculator is REQUIRED, and you must have your calculator during each class. If you need to use a calculator other than those listed, it MUST not perform symbolic mathematics and you must have my permission to do so. I will be demonstrating calculator techniques using the TI-84. You must have your calculator during every class period.

Other Technology*

Online office hours will use Zoom.

We will also use Canvas and Gradescope.

You will need a computer that meets TAMU's Bring Your Own Device policy

(<https://it.tamu.edu/services/academics-and-research/teaching-and-learning-tools/computer-requirements/>) and a high-speed internet connection

You will need to scan and upload written work as a PDF (this can be achieved with a cell phone or other technology – directions will be provided in Canvas).

You will also need appropriate software (PDF reader, Zoom on both your phone and computer, and the latest update on an internet browser - Chrome or Firefox is recommended)

Texas A&M Student ID

Bring your student ID to each class/exam. If you have a question about your grade, please bring your student ID when we meet.

* To purchase these materials, visit the [TAMU bookstore](#) (online or in-person) or view the options listed in Canvas.

Grading Policy

The course grading will be based on the tables below. At the end of the semester you will receive the grade you *earned*, according to the scale given. Due to FERPA privacy issues, I cannot discuss grades over email or phone. If you have a question about your grade, please schedule an individual meeting with me and bring your TAMU student ID.

Grade Breakdown		
Activity	Date	Percentage
Online Homework (WebAssign)	Weekly	13%
Quiz & Group Work	Regularly	15%
Video Quizzes	Regularly	3%
Checks for Understanding	Regularly	4%

Exam I	9/15/22	15%
Exam II	10/13/22	15%
Exam III	11/17/22	15%
Final Exam	See Final Exam Schedule below	20%
TOTAL		100%

Grading Scale	
Range	Grade
$90 \leq \text{Average} \leq 100$	A
$80 \leq \text{Average} < 90$	B
$67 \leq \text{Average} < 80$	C
$57 \leq \text{Average} < 67$	D
Average < 57	F

Online Homework

Online homework will be completed in WebAssign. A link to each WebAssign homework assignment will be available in Canvas. Students must access WebAssign through these links. Online homework assignments will normally be due on Thursdays, but there may be exceptions. All due dates can be found in both WebAssign and Canvas. Students will have three attempts to answer each question before the question is counted incorrect. Students are also given two randomizations of each question in each assignment. The higher score of the two randomizations will be recorded in both WebAssign and Canvas.

If a student transfers from one section of MATH 140 to another, it is the student's responsibility to inform the new instructor that they have transferred from another section **AND** fill out the Student Help Request Form (linked in Canvas). When completing the form, students must clearly state both their old and new course section numbers. Students should not attempt to access any online homework assignments in the new Canvas course until after they have been transferred by the department to the new section of WebAssign.

Important: Do not wait until the last minute to complete your online homework as last-minute technical difficulties will not be an excuse for missing a deadline.

Quizzes & Group Work

Quizzes and group work will be given regularly throughout the semester and may be in-class or take-home. Some quizzes and/or group work may incorporate the use of the iClicker system.

Video Quizzes in Canvas

Each week students will be assigned videos to watch in Canvas. The videos cover portions of the student lecture notes provided by the instructor. **Students are expected to fill in their notes as they watch the videos outside of class.** Each video will include a quiz for the student to complete after watching the video. The instructor will let the students know when the videos need to be watched each week.

Checks for Understanding

- **Clicker Questions/Class Polling Questions:** Throughout the semester, the iClicker system will be used to check for understanding in the classroom. Students are required to bring their designated iClicker device to class every day, as the checks may be done at any time. Students who have excused absences need to contact me to agree upon a satisfactory alternative.
- **Discussion Forums/Canvas Assignments:** Throughout the semester, students may be required to complete discussion forums or other assignments in Canvas. The purpose of these assignments is for the student to demonstrate their understanding of material taught in class and through the lecture videos.

Exams

You must have your student ID and approved calculator during each exam. The memory in your calculator must be reset before each exam. Calculators and student IDs will be checked before and/or during each exam. Additional requirements and information about exams will be given closer to exam time. The tentative exam schedule is as follows:

Exam I: Thursday, Sept. 15, 2022

Exam II: Thursday, Oct. 13, 2022

Exam III: Thursday, Nov. 17, 2022

Final Exam

The final exam will be **comprehensive** and is **required** for all students. You must have your student ID and approved calculator (memory cleared) to take the final exam. If your final exam grade is higher than your lowest test grade, the grade on your final will replace that test grade in the final grade calculation. The final exam schedule is as follows:

Final Exam Schedule		
Section	Class Time	Final Exam Date and Time
501	TR 8:00 - 9:15 AM	Monday, Dec. 12, 1:00 - 3:00 PM
516 and 816	TR 9:35 - 10:50 AM	Friday, Dec. 9, 12:30 - 2:30 PM
514	TR 12:45 - 2:00 PM	Wednesday, Dec. 14, 8:00 - 10:00 AM

Attendance and Make-up Policies

Attendance

Attendance is essential to complete this course successfully. “Attending” class is not just physically being present in the room. To really attend class, you should have your preparation work completed by the beginning of class, present your work to the class or your group when requested, share ideas with classmates, and listen attentively when other people share their ideas. **Please attend and participate in all classes.**

Excused Absences

University student rules concerning excused and unexcused absences, as well as makeups, can be found at <http://student-rules.tamu.edu/rule07>. In particular, make-up exams, quizzes, assignments, or late homework will NOT be allowed unless a **University approved reason is given to me in writing**. Notification *before* the absence is **required** when possible. In cases where advanced notification is not possible, you must notify me **within two business days** of the last date of absence, including an explanation of why notice could not be sent prior, to arrange a makeup for any missed exam, quiz, or assignment. In non-COVID related cases where an exam, quiz, assignment, or homework is missed due to an injury or illness, I require a doctor’s note and will not accept the “University Explanatory Statement for Absence from Class” form. Further, an absence due to a non-acute medical service or appointment (such as a regular checkup) is not an excused absence. In the case of a COVID-related absence, medical documentation is not required. However, to receive an excused absence, you must use the University’s student self-reporting form (<http://tx.ag/COVIDStudentExcuse>) and send the generated excused absence form to me as soon as possible.

Make-up Policy

Make-up exams, quizzes, assignments, and homework will only be allowed due to a University excused absence (in writing). To qualify for a makeup, you must also contact me according to the timeline stated in Student Rule 7 of the University Student Rules.

In the case of making up an exam, you will be expected to make up your exam through the Math Department at the next possible make-up exam time. If you do not complete your make-up exam on the next available make-up day, you must have a University approved excused absence (in writing) for ALL the possible make-up days you do not attend, in addition to the regular exam day you missed. In either case, **you must contact me ASAP to schedule your make-up exam** because I have to request space in the departmental exam for you.

Late Work Policy

For this course, late work is defined as work (unrelated to excused absences) that a student tries to submit after a posted deadline. In this class, late work will NOT be accepted.

Course Schedule

Course Schedule		
Week	Topic	Sections
1: 8/24 - 8/26	Introduction to the course	Introduction
	Basic Matrix Operations	1.1
2: 8/29 - 9/2	Matrix Multiplication	1.2
	Review of Lines	2.1
	Modeling with Linear Functions	2.2
3: 9/6 - 9/9	Modeling with Linear Functions	2.2
	Systems of Two Equations in Two Unknowns	2.3
	Setting up and Solving Systems of Linear Equations	2.4
	Note: Labor Day is 9/5 (no classes)	

4: 9/12 - 9/16	Setting up and Solving Systems of Equations EXAM I - Thursday, 9/15	2.4 Exam I
5: 9/19 - 9/23	Setting up Linear Programming Problems Graphing Systems of Linear Inequalities in Two Variables Graphical Solutions of Linear Programming Problems	3.1 3.2 3.3
6: 9/26 - 9/30	Simplex Method Mathematical Experiments	3.4 4.1
7: 10/3 - 10/7	Basics of Probability Rules of Probability Probability Distributions and Expected Value	4.2 4.3 4.4
8: 10/12 - 10/14	EXAM II - Thursday, 10/13 Note: Fall Break is 10/10 - 10/11 (no classes)	Exam II
9: 10/17 - 10/21	Relations and Functions Polynomial Functions	5.1 5.2
10: 10/24 - 10/28	Polynomial Functions Rational Functions Power and Radical Functions	5.2 5.3 5.4

11: 10/31 - 11/4	Piecewise-Defined Functions	5.5
	Exponential Functions	5.6
	Combining and Transforming Functions	5.7
12: 11/7 - 11/11	Inverse Functions and Logarithms	5.8
13: 11/14 - 11/18	EXAM III - Thursday, 11/17	Exam III
14: 11/21 - 11/22	Interest and Effective Rates	6.1
	Annuities, Sinking Funds and Amortization	6.2
	Note: Reading Day on 11/23 (no classes); Thanksgiving Holiday is 11/24 - 11/25 (no classes)	
15: 11/28 - 12/2	Annuities, Sinking Funds and Amortization Review	6.2
16: 12/5 - 12/9	Review Final Exams (Final exam covers all previous sections as well as Sections 6.1 & 6.2; see previous table for specific date and time)	
17: 12/12 - 12/14	Final Exams (Final exam covers all previous sections as well as Sections 6.1 & 6.2; see previous table for specific date and time)	

Other Course Information

The Role of Business Math Teaching Assistants (BMTA) while in the Classroom

During class, you will notice that your BMTAs will circulate throughout the classroom intermittently to assist students with content related questions. They can clarify misunderstandings, reiterate statements from the instructor, or redirect students in their mathematical thinking. The BMTAs are available to answer questions during class in a discreet

and non-disruptive manner. You will also notice, however, that the BMTAs will assist students by eliminating distractions such as asking students to stop talking during times they should be listening, putting away cell phones or other electronic devices if they are not being used for educational purposes related directly to the lecture, or asking students to silence music playing from headphones. The BMTAs and I want to make sure that our classroom is a supportive learning environment for you to learn the content of Math 140.

Technology Support

If you need assistance regarding a course-related technology issue, consider seeking help from the 24/7 TAMU IT Help Desk: <https://it.tamu.edu/help/>

Learning Resources

Office Hours

Your BMTAs and I have office hours each week (listed in Canvas and at the beginning of the syllabus). You are welcome to attend as many of those office hours as you would like. You can come and go as needed during our office hours, so you do not have to be there when they start and stay until they end. We want that to be a casual time when we can gather together in one room and discuss mathematics. This is like a study hall with some of your classmates and me in the room. This allows you to ask questions when you have them and lets you listen to other people's questions. Please bring your notes and your work with you.

The zoom office hours have been set to include some time when classes are not usually scheduled so even if you have classes during most of the office hour, you can still pop in from your phone as you walk between classes to get some questions answered. Everyone attending online office hours will be joining one room, so please mute your microphone when you are not speaking so we are not distracted by the background noise. If no one is speaking, please unmute and ask a question. If you need my attention while someone is talking, please use the chat feature. If you need to speak to me individually, let me know so we can move to a breakout room where the other students cannot hear the conversation.

Math Learning Center (MLC) Support

The **Math Learning Center (MLC)** offers various forms of support for MATH 140, both online and face-to-face, including drop-in [Help Sessions](#), [Tutoring by Appointment](#), [Week-in-Review](#) sessions, and other activities.

- ***Week-in-Review (WIR)***: Two current MATH 140 instructors, Patrick Orchard and Robert Rahm, will each hold Week-in-Review sessions each week via Zoom. The Week-in-Review is open to all MATH 140 students to review the topics from the previous week and provide additional examples. To access the schedule, Zoom link, and problem sets for each Week-in-Review, please visit the Week-in-Review webpage on the **Math Learning Center (MLC)** website: <http://mlc.tamu.edu/Online-Help-Services>

- **Help Sessions:** The **Math Learning Center (MLC)** will hold Help Sessions regularly each week. Help sessions are an opportunity for you to ask questions as well as get help with your homework. These sessions are led by students, and you may come and go as your schedule allows. Once determined, the schedule will be announced during class, posted on Canvas, and posted at <http://mlc.tamu.edu/Online-Help-Services>.

Additional Class Policies

Maintaining a Respectful Classroom Environment

Please do your part (attitudes, words, and actions) to make our class a place where everyone can feel comfortable exploring mathematical topics without distractions. Always remember and uphold the Aggie core values: Respect, Excellence, Leadership, Loyalty, Integrity, and Selfless service.

EMAIL

Check your official TAMU email account EVERY day. You are responsible for any information I send via email. Please, include your first and last name, section number, and any other important information in your email to help me reply more promptly.

Electronic Devices Policy

- Electronic devices can only be used for educational purposes that relate to activities done in class.
- The only electronic devices allowed for use during exams and quizzes are the approved calculators for this course.
- See your instructor if you have other circumstances where a device is needed daily for non-class related items (i.e., medical, first responder, etc.).

Academic Integrity

You will read more about the Academic Integrity Statement and Policy in the University Policies section. It is VERY important to me that you abide by that policy: “An Aggie does not lie, cheat or steal, or tolerate those who do.” If you have any questions about whether something would be considered cheating, ask me before you do it. However, here is some general guidance:

- In this course, I encourage you to discuss homework assignments and their solutions with your classmates. Study groups are a great way to learn. However, it is NOT permissible to copy homework solutions from another source (person, book, internet, etc.). Make sure that you understand and could rework anything that you submit for a grade.
- It is NOT permissible to communicate about any aspect of any check for understanding, quiz, or exam until ALL students have completed the check for understanding, quiz or exam (unless your instructor gives specific permission to do so).

- The penalties for violating this policy could include an F on an assignment, exam, or the entire course.

Copyright of Materials

All class materials (notes, exams, assignments, videos, etc.) are protected by U.S. Copyright Laws and may not be copied, posted, or reproduced without permission.

University Policies

This section outlines the university level policies. The TAMU Faculty Senate established the wording of these policies.

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. ([See Student Rule 24](#)).

Academic Integrity Statement and Policy

“An Aggie does not lie, cheat or steal, or tolerate those who do.”

“Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one’s work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case” ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources office on your campus (resources listed below). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.

- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University’s goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University’s [Title IX webpage](#).

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student’s academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing available resources and services on your campus.

Students who need someone to talk to can contact [Counseling & Psychological Services](#) (CAPS) or call the [TAMU Helpline](#) (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.
