

Math 141 – Business Mathematics I

Texas A&M University

Spring 2015

Catalog Description: *Math 141: Business Mathematics I (Credit 3)* Linear and quadratic equations and applications; functions and graphs, systems of linear equations, matrix algebra and applications, linear programming, probability and applications, statistics.

Prerequisites: High school algebra I and II and geometry. Credit will not be given for more than one of MATH 141 and 166.

Learning Outcomes

This course is focused on quantitative literacy in mathematics found in both business and everyday life. Upon successful completion of this course, students will be able to:

- Logically find relationships among variables to formulate mathematical models for everyday applications, including business applications, such as cost, revenue, profit, supply and demand.
- Understand matrices and their applications, including solving systems of linear equations.
- Construct linear programming problems for various applications and solve using graphical techniques, including finding the optimal point(s) where a company minimizes its cost or maximizes its profit.
- Understand set terminology and its relationship to symbolic notation.
- Use Venn diagrams to model the relationship between sets and set operations, with applications to real-world problems.
- Understand the principles of probability and counting and apply these concepts to a variety of problems, such as finding the number of ways or probability of obtaining particular card hands.
- Identify types of random variables and calculate probabilities and statistics for random variables.
- Apply the concepts of finance to real-world situations, such as financing a car or house.

Core Objectives

Critical Thinking

- Students will carefully examine and interpret statements to determine equivalent mathematical notation and/or equations.
- Students will think creatively 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 examine given information about sets to find the number of elements in particular subsets.
- Students will innovatively use counting techniques (multiplication principle, combinations, permutations) to determine the number of ways a task can be completed and to find the probability the task occurs.
- Students will synthesize information to determine whether or not events are independent.
- Students will differentiate between basic and conditional probability, including knowing when Bayes' Theorem is appropriate.
- Students will evaluate probabilities involving Venn diagrams, tree diagrams, and independent events.
- Students will classify random variables as finite discrete, infinite discrete, or continuous and find all possible values they may assume.
- Students will understand the difference between odds and the probability of an event, and be able to determine one given the other.
- Students will use inquiry to resolve whether or not an experiment is binomial.
- Students will calculate probabilities of binomial and normal random variables.
- 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.
- Students will effectively communicate information about sets and experiments using written symbolic notation.
- Students will visually represent sets with Venn diagrams.
- Students will visually display experiments and associated probabilities using tree diagrams.
- Students will communicate statistics through probability distributions and graphically through histograms.
- 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 describe numerical data by finding relevant statistics, including expected value, median, mode, standard deviation, and variance.
- Students will use statistics to make informed conclusions about real-world problems, such as determining the premium for an insurance policy.
- Students will use effective interest rates to select the best loan or savings option.
- Students will analyze financial information to make decisions regarding everyday applications, such as loan payments, annuities, amortizations, or sinking funds.



Math 141 - 501

Instructor: Heather Ramsey

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Please include your full name and section number (501) in any email you send to me.

Websites: <http://www.math.tamu.edu/~ramsey>
ecampus.tamu.edu

Office: Blocker 221A

Office Hours: Mondays 10:30am-12pm
and Wednesdays 3pm-4:30pm
and by appointment

* All office hours will be held in BLOC 506A, unless you are told otherwise. *

Phone: 979.845.4299 (Note: You will most likely get a quicker response from me via email.)

Class Time and Location: Math 141-501 meets Tuesdays and Thursdays from 8am until 9:15am in ILSB 1105 starting January 20, 2015.

Catalog Title and Description: (CREDIT 3.0) *Business Mathematics I*. Linear and quadratic equations and applications; functions and graphs, systems of linear equations, matrix algebra and applications, linear programming, probability and applications, statistics. Prerequisites: High school algebra I and II and geometry. **Credit will not be given for more than one of MATH 141 and MATH 166.**

Required Materials:

- **Textbook:** *Finite Mathematics for the Managerial, Life, and Social Sciences*, 11th Ed. by Tan
 - **You have already purchased the ebook:** Access to an online copy of this text has been included in your course fees. Information on how to access your ebook can be found under the “Student Information Page” at <http://www.math.tamu.edu/courses/eHomework/>. Look under the Math 141 link.
 - If you prefer to have a hard bound or loose-leaf copy of the textbook you may buy one, but this is optional.
- **Calculator:** A TI-83, TI-84 (Regular, Plus or Silver edition) or the TI-Nspire (non-CAS version with an 84 faceplate) calculator is **REQUIRED** and you must bring your calculator to class each day. You will not be allowed to use any type of calculator (including calculator applications on your cell phone or computer) other than those listed above. Sharing calculators during quizzes and exams is strictly forbidden and is considered an act of scholastic dishonesty. Before each exam, you will be required to clear and reset your calculator's memory
- **Texas A&M Student ID:** You must bring your student ID to each class.
- **Pencils:** All written materials that are submitted for a grade must be completed in **pencil** unless told otherwise.
- **Lecture Notes:** All students will be expected to print the lecture notes posted on eCampus and bring the appropriate sections with them to class each day.

Email Policy: Check your TAMU email account EVERY day. You are responsible for any information I send via email. Also, because of privacy rights, I cannot discuss grades via email or over the phone.

Cell Phone/Laptop Computer Policy: As a courtesy to me and your classmates, all cell phones, laptop computers, tablets, and other electronic devices must be OFF and put away during every class period.

Grading Policy: Grades will be calculated according to the following percentages:

Average of 3 Exams	54%	A = 90-100%
Online Homework	10%	B = 80-89%
Quizzes	13%	C = 70-79%
Comprehensive Final Exam	23%	D = 60-69%
		F = below 60%

At the end of the semester, you will receive the grade you *earned*, according to the distribution above. Note: Any questions regarding grading/scoring must be made **within two days** of the return of the exam or quiz or no change in the grade will be made.

Make-up Policy: No make-ups will be given without written evidence of an official University excused absence. (See *University Student Rules*.) According to Section 7.3 of the *University Student Rules*, for an absence to be considered excused,

the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g. accident or emergency) the student must provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class.

If no such notice is given, the rights to a make-up are forfeited. In addition (and also in accordance with *University Student Rules*), a **written** excuse must be presented upon return to class. Specifically, in the case of illness or injury, students are required to obtain a confirmation note from a health care professional affirming date and time of a medical office visit regarding the illness or injury. *I will NOT accept the Explanatory Statement for Absence from Class form as sufficient written documentation of an excused absence.*

Exams: There will be three in-class exams and a comprehensive final, tentatively scheduled as shown below. I will NOT curve test grades.

Tentative Exam Schedule

Exam 1 : Thursday, Feb. 12
Exam 2 : Thursday, Mar. 12
Exam 3 : Thursday, Apr. 16

Final Exam

Friday, May 8, 1pm-3pm

Scheduled Make-Up Exams: If you have a University approved absence for missing an exam, you will be expected to make up your exam according to the departmental make-up exam schedule, starting with the earliest option for each exam, after being given approval by me. Only if you have a University approved absence for the day of the exam AND the makeup day will you be allowed to use a later option or have other arrangements made. If you are in the situation where you must miss an exam, you must contact me as soon as possible (prior to the absence if there is no emergency or accident) and I will give you information about making up your exam.

Quizzes: Announced and unannounced in-class and take-home quizzes will be given throughout the semester. Each quiz will be graded on a 10-point scale. Quizzes may be given at any time during class, so make sure you arrive on time to each class and do not leave class early. You will be expected to show all of your work, including calculator methods, on all problems for full credit, unless it is stated otherwise. **There will be no makeup quizzes, since when the course grade is calculated your two lowest quiz grades are dropped.** If you know ahead of time you will have multiple excused absences (example: member one of TAMU's sport teams), you will need to come to my office hours during the first two weeks of school so we can discuss provisions for multiple absences.

Homework:

- **Graded Homework:** All graded homework problem sets will be based in the online system WebAssign. **Access to WebAssign is included in your course fees—you do not have to purchase an access code separately.**
 - Everything you will need to know about logging into your account is available at <http://www.math.tamu.edu/courses/eHomework/>. Please visit this site for help with technical difficulties, announcements, and more information. I suggest you bookmark this page and visit it before you login to WebAssign each time.
 - Be sure to start each assignment well in advance of the due date.
 - You should use Mozilla Firefox and have the most updated versions of Java and Flash on the computer you are using to alleviate technical problems.
 - If you ever have technical issues with WebAssign, please fill out a Student Help Request Form found at <http://www.math.tamu.edu/courses/eHomework/>.
 - **I will not give extensions or grade adjustments due to technical difficulties at the last minute.**
- **Suggested Homework:** Mathematics cannot be learned and fully understood by simply watching someone else do it. It must be practiced by working many, many problems. In addition to graded homework, I STRONGLY recommend that you keep a notebook in which you work the problems from the suggested homework list found at http://www.math.tamu.edu/courses/math141/141suggested_homework_11ed.pdf. The problems listed are found in your online textbook in eCampus. It would be best for you to work these suggested homework problems after a topic is covered in class, but before trying the graded homework.

It is imperative that you work many different problems in order to help you be fully prepared for quizzes and exams.

Attendance: Attendance is required in this class. All students are expected to arrive on time and be ready to actively participate in lecture every day *as soon as lecture begins, which is promptly at 8am.* I STRONGLY suggest that you make every attempt to not miss a single day of lecture. Falling behind in this course can be very detrimental to your grade. Attendance will be used in conjunction with your final exam grade as a consideration in the case of borderline grades.

Scholastic Dishonesty: Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

You are encouraged to work together on the suggested homework problems, but do not copy another student's

work. Copying work done by others, either in class or out of class, is an act of scholastic dishonesty and will be prosecuted to the full extent allowed by University policy.

Storing formulas or unauthorized programs in your calculator is also an act of scholastic dishonesty and will not be tolerated. Using or having an unapproved program or any formulas stored in your calculator during an exam will result in a zero on the exam. Also, sharing calculators during a quiz or exam will result in a grade of zero for all parties involved.

Having a cell phone out during any graded assignment will result in an automatic zero, and you will be reported to the Aggie Honor Office for academic dishonesty.

Always abide by the Aggie Code of Honor: *An Aggie does not lie, cheat, or steal or tolerate those who do.* For additional information on the Honor Council Rules and Procedures, consult <http://aggiehonor.tamu.edu>.

Extra Help and Preparing for Exams:

- ***Your Instructor:*** I want each and every one of my students to be successful in this class. Please feel free to ask questions in class. If you need more help, come by Blocker 506A during office hours or make an appointment to see me. Remember, I am here to help, but I cannot do that if I don't know that there is a problem.
- ***BMTA:*** Our class will have a Business Math Tutorial Assistant. This tutorial assistant will be offering additional help at times outside of my office hours and other provided help hours. Times and places for these additional hours of help will be posted on my website, in eCampus, and will be announced in class, once they are determined.
- ***Your Classmates:*** Get to know your classmates. Form study groups and work on suggested problems outside of class.
- ***Week-in-Review:*** There are Week-in-Review (WIR) sessions conducted by instructors each week. Each review is open to all Math 141 students to review the topics of the previous week and to provide additional examples. The days, times, and places of these reviews will be posted on my website, in eCampus, and will be announced in class, once they are determined. Additionally, this information can be found at <http://www.math.tamu.edu/courses/weekinreview.html>. Additional sets of old Week-in-Review questions with solutions are linked on my website.
- ***Practice:*** In order to succeed in this course, it is essential that YOU practice extra problems ON YOUR OWN. See the suggested homework list for the textbook and additional Week-in-Review problem sets linked on my website. Even if you are not able to attend either WIR, you can still use the provided problems for practice. If you regularly attend a particular WIR, it might be a good idea to work through the problems from the other WIR, on your own, for additional practice. I highly recommend that you **practice problems DAILY**. Mathematics cannot be learned by simply watching someone else do it.
- ***Help Sessions:*** Help sessions are an opportunity for you to ask questions and get help with your homework. The schedule for help sessions can be found at <http://www.math.tamu.edu/courses/helpsessions.html>. These sessions are come-and-go, i.e., you can come at any point during the help session and leave whenever you want.
- ***Video Resources:*** In WebAssign, under the Announcements section, there is a link to resource videos for the topics covered in this class. This is an especially good resource if you would like to listen to a topic being explained.
- ***Calculator Help:*** Step-by-step written keystroke directions are available on my website for all the calculator functions in the course.

ADA Policy 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 believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>.

Copyright Policy: All printed materials including (but not limited to) handouts, quizzes, exams, and information found on the web are protected by copyright laws. No exams, quizzes, or homeworks may be shared with anyone outside our class.

Tentative Course Schedule

Tentative Schedule: All changes will be announced in class.			
Week 1	Jan. 20-23	Introduction, Sections 1.3, 1.4	Equations of Lines Linear Models for Business Applications Intersection of Lines
Week 2	Jan. 26-30	Sections 1.Q, 2.1, 2.2	Quadratic Functions and Applications Formulating Systems of Linear Equations Gauss-Jordan Elimination Solving Systems of Linear Equations
Week 3	Feb. 2 – 6	Sections 2.3, 2.4, 2.5	Solving Systems of Linear Equations Arithmetic Operations with Matrices Matrix Multiplication
Week 4	Feb. 9 – 13	Review, Exam I (1.3-1.4, 1.Q, 2.1-2.5)	
Week 5	Feb. 16 – 20	Sections 3.1, 3.2, 3.3	Graphing Systems of Linear Inequalities Formulating Linear Programming Problems Graphical Solution of Linear Programming Problems (Method of Corners, Leftovers)
Week 6	Feb. 23 – 27	Sections 6.1, 6.2, 6.3	Sets and Set Operations Venn Diagrams The Multiplication Principle
Week 7	Mar. 2 – 6	Sections 6.3, 6.4, 7.1	The Multiplication Principle Permutations and Combinations Experiments, Sample Spaces, & Events
Week 8	Mar. 9 – 13	Review Exam II (3.1-3.3, 6.1-6.4, 7.1)	
	Mar. 16 – 20	SPRING BREAK	
Week 9	Mar. 23 – 27	Sections 7.2, 7.3, 7.4	Basic Probability Rules of Probability Use of Counting Techniques in Probability
Week 10	Mar. 30 – Apr. 3	Sections 7.5, 7.6	Conditional Probability & Tree Diagrams Independent Events Bayes' Theorem
Week 11	Apr. 6 – 10	Sections 8.1, 8.2, 8.3, 8.4	Classification of Random Variables Probability Distributions of Random Variables Expected Value, Statistics, & Odds Variance and Standard Deviation The Binomial Distribution
Week 12	Apr. 13 – 17	Sections 8.4, Review Exam III (7.2-7.6, 8.1-8.4)	The Binomial Distribution
Week 13	Apr. 20 – 24	Sections 8.5, 8.6, 5.1	The Normal Distribution Applications of the Normal Distribution Simple & Compound Interest Effective Rates of Interest
Week 14	Apr. 27 – May 1	Sections 5.1, 5.2, 5.3 Review	Annuities Amortization and Sinking Funds
Week 15	May. 4 – 5	No TR Classes this week - Tuesday is a "Redefined Friday"	
Final	May 8	Final Exam (Cumulative)	