

Catalog Description: *Math 166: Topics in Contemporary Mathematics II (Credit 3)* Finite mathematics, matrices, probability and applications. *Prerequisites:* High school algebra I and II and geometry. Credit will not be given to more than one of Math 141 and 166.

Learning Objectives

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

- Understand and apply the rules of logic and sets.
- Recognize patterns in order to understand the principles of probability and counting and apply these concepts to a variety of problems; for instance, finding the probability of drawing a particular hand from a deck of cards.
- Identify types of random variables and be able to calculate probabilities and statistics for these random variables.
- Apply the concepts of finance to everyday experiences, such as paying off mortgages and saving for retirement.
- Understand matrices and their relationships to applications including solving systems of linear equations and solving problems involving Markov processes and game theory.

Core Objectives

Critical Thinking

The following critical thinking skills will be assessed on in-class quizzes and exams.

- Students will create a truth table for (nontrivial) compound statements.
- Students will analyze the given information about sets to find the number of elements in particular subsets.
- Students will synthesize information to determine whether or not events are independent.
- Students will evaluate probabilities involving Venn diagrams, tree diagrams, and independent events.
- Students will differentiate between basic and conditional probability including knowing when Bayes' theorem is appropriate.
- Students will carefully examine and interpret statements to determine the equivalent mathematical notation or equation.
- Students will understand the difference between odds and the probability of an event and be able to determine one from the other.
- Students will innovatively use counting techniques (multiplication principle, permutations, combinations) to determine the number of ways a task can be completed and to find the probability that the task occurs.
- Students will use inquiry to resolve whether or not an experiment is binomial.
- Students will classify random variables as finite discrete, infinite discrete, or continuous and give all the possible values it may assume.
- 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.
- Students will think creatively in order to set up a system of equations and solve a word problem.
- Students will understand what an inverse matrix is and its relationship with an identity matrix.
- Students will synthesize data from a word problem to set up a transition matrix of a Markov process.

Communication Skills

The following communication skills will be assessed on in-class quizzes, exams and in lecture.

- Students will develop an understanding of the relationship between mathematical symbols of logic and their English language counterpart.
- Students will effectively communicate information about sets and experiments using written symbolic notation.
- Students will visually display experiments and associated probabilities using tree diagrams.
- Students will express mathematical concepts both abstractly with equations and in writing.
- Students will communicate statistics through probability distributions and graphically through histograms.

- 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 answer questions during lecture concerning topics discussed in class.

Empirical and Quantitative Skills

The following empirical and quantitative skills will be assessed on in-class quizzes and exams.

- Students will describe numerical data sets by finding relevant statistics, such as expected value, median, mode, standard deviation and variance.
- Students will use statistics to make informed conclusions about real-world problems including determining the premium for an insurance policy.
- Students will analyze financial information to make decisions regarding everyday applications, such as loan payments, annuities, amortizations, and sinking funds.
- Students will use effective interest rates to select the best loan or savings option.
- Students will create empirical probability distributions based on a given set of data.

Texas A&M University
MATH 166
Topics in Contemporary Mathematics II
Fall 2013
Section 504
TR 2:20-3:35 BLOC 149

Instructor: Jaclyn Kessler

Office: Blocker 616

Office Hours:

- TBA and by appointment

E-Mail Address: jkessler@math.tamu.edu

(Check your neo email account every day. This will be a major line of communication between the student and the instructor. I will send urgent announcements and important information via email. You are responsible for any information sent via email. When you send an email, please include your full name, course number (166), and section number.)

Web Page: <http://www.math.tamu.edu/~jkessler>

(Check the web page regularly. I will post exam information, class announcements, important information, class notes, and daily schedule on the web page. There will also be a list of suggested homework, help session schedules, a link to the available Math 166 Week-In-Review, and a link to the departmental web page for the course.)

Texts: Included in the course fees is access to WebAssign as well as an eBook version of the text through WebAssign. If you would like to purchase a hard copy version of the text:

Applied Finite Mathematics by Tomastik and Epstein - ISBN: 1133444288 (loose-leaf)

Calculator Policy: You will be required to bring to class every day either a TI-83, TI-84 (Plus or Silver Editions are fine), or TI-Nspire (non-CAS version). You may not use any calculator that is able to perform symbolic math, such as a TI-89. You will also be required to reset memory before each exam. If there are any programs that you want to keep for personal use, you will want to save them to your computer so you can reload them after the class is completed.

Student IDs: You must bring your student ID to every class.

Course Description and Prerequisites: CREDIT: 3. Finite mathematics, matrices, probability and applications. Prerequisites: High school algebra I and II and geometry. Credit will not be given for more than one of MATH 141 and MATH 166.

Grading Policy:

Exam I	15%	A = 90% – 100%
Exam II	15%	B = 80% – 89%
Exam III	15%	C = 70% – 79%
Final Exam	25%	D = 60% – 69%
Quizzes	12.5%	F = 0% – 59%
In-Class Assignments	5%	
WebAssign Homework	12.5%	
Total	100%	

At the end of the semester, you will get the grade you *earned*, according to the distribution above. No exceptions.

Exams: There will be three in-class exams and a comprehensive final exam. You must bring a valid form of I.D. to every exam (i.e., student ID or Driver's License). Tentative dates for the in-class exams is as follows:

Exam I September 19

Exam II October 17

Exam III November 13

The final exam will be given on **WEDNESDAY, DECEMBER 11, 1-3pm BLOC 149.**

Quizzes: Quizzes will be given regularly throughout the semester. They may be announced or unannounced, in-class or take home. Quizzes must be done completely on your own. You may use the resources listed in the directions of the individual quiz. You must show all of your work to obtain full credit. I will drop your lowest quiz grade at the end of the semester.

In-Class Activities: There will be about one in-class activity every week. The purpose of these is to provide you an opportunity to practice a concept soon after it is taught. There will be no make-ups for in-class activities. I will drop your lowest activity grade at the end of the semester. If you miss an activity due to a University excused absence and provide the appropriate documentation, the assignment missed will not be included in your in-class assignment grade.

WebAssign Homework: Homework will be due on Wednesday nights. Since the homework is done at your convenience, there will be no make-ups or extensions on homework. The homework assignments will not be re-opened at the end of the semester. I will drop your lowest two individual homework grades. If you have questions on the homework, please visit me during office hours or go to help sessions. (Information on Help Sessions will be posted on the Departmental Webpage.)

<https://www.webassign.net/tamu/login.html>

eLearning: All grades will be posted on eLearning. Grades on eLearning will be updated after every exam.

<http://elearning.tamu.edu/>

Attendance: I strongly encourage you attend and participate in every lecture. You must arrive and be fully prepared for class by the class start time. You are expected to stay the entire class time, unless you notify me prior to class. If you miss class due to a University excused absence and have proper notification, you will be able to hand copy notes during my office hours. Having an exam for another class is not a University excused absence, so plan your schedule accordingly.

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." 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 too severe or contagious to attend class or in the case of 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 and confirming the need of the absence (with permission to verify) before a make-up will be given. The Texas A&M University Explanatory Statement for Absence will NOT be accepted. An absence for a non-acute medical service does not constitute an excused absence. Students with an official University excused absence are permitted to make up work only for the dates of the absence.

Late Work Policy: Late work will not be accepted without a University excused absence. The definition of late work is any assignment not in my possession once collected from your assigned row.

Grade Questions: You have two business days from the time any assignment is returned to resolve any grade questions. You should retain all returned work through the end of the semester to compare the grade assigned to the grade recorded in eLearning. I cannot discuss grades via email or phone.

Academic Integrity Statement:

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

I further refer the student to the Honor Council Rules and Procedures on the web at

<http://www.tamu.edu/aggiehonor>

Students with Disabilities: 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>

Classroom Etiquette: During class I will stay focused on teaching you mathematics, so please stay focused on learning the mathematics being taught. This means you should stay awake throughout the class, you should not be reading a newspaper or materials from another course, you should refrain from discussion not related to class and you should not leave class early unless you have cleared it with me first. If I feel you are being disruptive or disrespectful during class, you may be asked to leave. You should never have a cell phone out or turned on during class. No unapproved electronic devices are allowed in the classroom. If I hear or see your cell phone out, I may ask you to leave the classroom and you will therefore not be able to complete any in-class assignments.

Sources of Help:

- *Office Hours:* I am here to help, but I won't know if you have a question unless you ask! I encourage you to ask questions both in and out of class, come to office hours, and talk to me. The more you participate, practice, and attempt to understand, the more successful you will be.
- *Class Notes:* An outline of notes will be posted prior to class each day. It will be helpful to print these out and bring them to class. You should review your notes after class to make sure you understand everything covered and note any questions you may need answered before the next class. I will NOT post completed notes after class. If you miss class due to a University excused absence, you may hand copy the notes during my office hours. The notes are also designed to be a primary help for homework as well as a primary review for exams.
- *Your Classmates:* Form study groups! Ask each other for assistance. Work together to understand the material.
- *Week-In-Review (WIR):* There will be one Week-In-Review session held by me every week starting the second week of classes. Each review is open to all MATH 166 students and reviews the topics covered during the previous week of classes. The times and locations will be posted on the course's webpage, as well as announced in class.
- *Help Sessions:* Help sessions are an opportunity for you to ask questions and get help with your homework. The help sessions are led by undergraduate students. The dates and times will be posted on the departmental web page, as well as on my own.
- *Practice:* It is essential that you practice as many problems as you can. In addition to the quizzes, in-class activities, and WebAssign homework, there are suggested homework problems.
- Additionally, see *Tips for Success* on my Web Page.

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Tentative Schedule:

- Week 1: L.1-L.2, 1.1
- Week 2: 1.1-1.4
- Week 3: 1.4-1.6
- Week 4: 1.7, Review, Exam I (L.1-L.2, 1.1-1.7)
- Week 5: 2.1-2.2
- Week 6: 2.3-2.4,3.1
- Week 7: 3.1-3.3
- Week 8: 3.4, Review, Exam II (2.1-2.4, 3.1-3.4)
- Week 9: F.1-F.3
- Week 10: F.4, Intro to Systems, 4.3-4.4
- Week 11: 4.4, 5.1-5.2
- Week 12: 5.3, Review, Exam III (F.1-F.4, 4.3-4.4, 5.1-5.3)
- Week 13: M.1-M.3
- Week 14: G.1-G.2
- Week 15: Review
- Week 16: Final Exam (Comprehensive)