CLASS TIMES AND LOCATIONS

Sections 503 and 803 meet Tuesdays and Thursdays from 12:45 to 2:00 PM in RICH 114

CATALOG DESCRIPTION

Explorations in Mathematics (Credit 3) Application of mathematics to topics of contemporary societal importance using quantitative methods; may include elements of management science (optimal routes, planning and scheduling), statistics (sampling/polling methods, analyzing data to make decisions), cryptography (codes used by stores, credit cards, internet security), fairness (apportionment, voting), patterns (symmetry, tessellations, fractals), world health. *Prerequisites:* High school Algebra I and II.

LEARNING OUTCOMES

Upon successful completion of this course, students will be able to satisfy the subset of these outcomes that pertain to the topics chosen for the semester:

- **Design optimal and heuristic routes.**
- **Construct schedules that make the best use of resources.**
- **Display and analyze data.**
- **Determine good and bad samples for statistical data.**
- **Distinguish between good and bad inferences from data.**
- **Understand and apply the rules for identification numbers.**
- **Use cryptography to encode and decode information.**
- **Create a fair division of an item or items.**
- **Apportion using different apportionment methods.**
- Understand and apply concepts of symmetry.
- Apply mathematical concepts to world health issues.

CORE OBJECTIVES

The specific topics used to demonstrate the core objectives will be based on the topics chosen for the semester and will be a subset of the following

Critical Thinking
- **Students will determine which graph theory model should be used to represent real-world situations.**
- **Students will synthesize data to look for trends and correlation along with determining if there is bias or bad sampling.**
- **Students will analyze codes and ciphers to make and break encrypted messages**
- **Students will think creatively about how resources can be allocated fairly and decide the best way to divide contested items.**
- Students will analyze the symmetries of objects.
- Students will determine which mathematical model should be used to analyze a world health issue.

Communication Skills
- **Students will model streets, highways and communication infrastructure as a graph.**
- **Students will diagram machine scheduling problems as a Gantt chart.**
- **Students will display quantitative data as histograms, stem plots, boxplots, and scatter plots with all units and quantities clearly labeled.**
- **Students will express a word or phrase using various coding systems.**
- **Students will express the benefits and detriments of various apportionment methods.**
- Students will create a fractal.
- Students compare multiple models for world health issues.

Empirical and Quantitative Skills
- **Students will solve network, graph theory, scheduling and packing questions using brute force and heuristic models.**
- **Students will describe data sets by finding relevant descriptive statistics. Students will determine whether or not a result is statistically significant.**
- **Students will use check digit schemes and prove if the check digits are able to find errors in codes.**
- **Students will calculate how to divide items fairly and how to apportion representatives using several different apportionment procedures, including the one currently used to apportion for the United States House of Representatives.**
- Students will reflect, rotate, or translate objects.
- Students will model a world health issue.

INSTRUCTOR INFORMATION

Name	Tamara Carter, Instructional Assistant Professor
Email	tcarter@tamu.edu (please include your full name and class in all emails)
Office	Blocker 245A
Office Hours	Tuesdays and Thursdays 11:00 – 11:45 AM and 2:15 – 3:30 PM in Blocker 246, and by appointment in Blocker 245A
Course Page	www.math.tamu.edu/~tcarter Class material will be posted in eCampus (eCampus.tamu.edu)
Phone	Math Department: 979-845-3261 (There is no phone in my office, so email is a better way to reach me.)

REQUIRED MATERIALS

TEXTBOOK: COMAP *For All Practical Purpose: Mathematical Literacy in Today's World 9th ed.,* W. H. Freeman.
    (Print or electronic). Notice that this is NOT the newest edition.

WEBASSIGN ACCESS CODE: WebAssign will be used for homework in this class. In order to use WebAssign, you must purchase an access code. If you purchase a book, it MAY be bundled with the book. For access code purchasing information and options, please visit **http://www.math.tamu.edu/courses/eHomework/**

CALCULATOR: A non-programmable calculator that is able to find square roots. This calculator should NOT be on your phone, tablet, or computer. You will not be allowed to use programmable calculators (such as TI-83/84) on assignments. Please bring an approved calculator to every class. The TI-30XIIS is the preferred calculator.

TEXAS A&M STUDENT ID: Bring your student ID to each class.

TENTATIVE COURSE TOPICS AND CALENDAR OF ACTIVITIES

All changes will be announced in class, on eCampus, or via email.

WEEK	DATES	TOPIC		CHAPTER
1	Aug. 27, 29	Urban Services		1
2	Sept. 3, 5	Urban Services and Business Efficiency		1,2
3	Sept. 10, 12	Business Efficiency and Planning and Scheduling		2,3
4	Sept. 17, 19	Planning and Scheduling, Review	**EXAM I (Ch. 1, 2, 3)**	3
5	Sept. 24, 26	Exploring Data: Distributions		5
6	Oct. 1, 3	Exploring Data: Distributions and Relationships and Data for Decisions		5,6,7
7	Oct. 8, 10	Data for Decisions		7
8	Oct. 15, 17	Review	**EXAM II (Ch. 5, 6, 7)**	
9	Oct. 22, 24	Identification Numbers		16
10	Oct. 29, 31	Information Science		17
11	Nov. 5, 7	Review	**EXAM III (Ch. 16 and 17)**	
12	Nov. 12, 14	Fair Division and Apportionment		13, 14
13	Nov. 19, 21	Apportionment and Social Choice		14, 9
14	Nov. 26, 28	Social Choice	Thanksgiving Holiday	9
15	Dec. 3, 5	Review	Reading Day	
	Dec. 11	**EXAM IV (Ch. 13, 14, 9) is given during the final exam time.** Wednesday, December 11, 8:00 – 10:00 AM in our regular classroom http://registrar.tamu.edu/General/FinalSchedule.aspx		

GRADING POLICIES

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 come see me in person.

GRADE BREAKDOWN

Activity	Date	Percentage
Homework	Weekly	10%
Quizzes/Classwork	Weekly	10%
Exam I (Ch. 1, 2, 3)	9/19/19	20%
Exam II (Ch. 5, 6, 7)	10/17/19	20%
Exam III (Ch. 16 & 17)	11/7/19	20%
Exam IV (Ch. 13, 14, 9)	12/11/19	20%
TOTAL		100%

GRADING SCALE

Range	Grade
$90 \leq$ Average ≤ 100	A
$80 \leq$ Average < 90	B
$70 \leq$ Average < 80	C
$60 \leq$ Average < 70	D
Average < 60	F

GRADE APPEAL POLICY: If you believe that there was an error in the grading of an assignment, or if you do not understand why an answer was counted as incorrect, please discuss that issue with me within a week of the date the item is returned to the class.

HOMEWORK

The graded portion of your homework will be online in WebAssign. More information and the login link are available at http://www.math.tamu.edu/courses/eHomework/
There are also book problems that will not be taken up for a grade but are important for your test preparation.

QUIZZES

In-class quizzes and in-class assignments will be taken for a grade and may not be announced in advance.

EXAMS

Everything discussed in class, quizzes, and homework is fair game for content on exams. You should also read the textbook. Exams 1, 2, and 3 will be taken during normal class time. Our fourth exam will be taken during our final exam time slot.

Exam I: Thursday, Sept. 19, 2019   **Exam II**: Thursday, Oct. 17, 2019   **Exam III**: Thursday, Nov. 7, 2019

EXAM IV

The fourth exam will be given during the final exam time which is Wednesday, December 11, 2019 from 8:00 – 10:00 AM (You can refer to http://registrar.tamu.edu//General/FinalSchedule.aspx for the University final exam schedule.)

Tamara Carter

ATTENDANCE AND MAKE-UP POLICIES

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete this course successfully. University rules related to excused and unexcused absences and make-ups are located on-line at http://student-rules.tamu.edu/rule07. Please notify me via email **prior** to the date of an absence, if possible.

Consistent with Texas A&M Student Rules, in cases where advance notification is not feasible (e.g. accident, or emergency), you 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.

- For injury or illness too severe or contagious to attend class (even if it is less than the 3 days mentioned in rule 7), you must provide confirmation of a visit to a health care professional affirming date and time of visit for the absence to be "excused". The Texas A&M University Explanatory Statement for Absence from Class form will not be accepted in this case.
- It is YOUR responsibility to learn what you missed from class, obtain any notes and assignments, and complete assignments by the regularly scheduled due date. In other words, **missing class on the day work was assigned is not a reason for an extension**.
- It is also your responsibility to schedule a make-up exam if one is needed. Makeup exams should be taken prior to the next class if feasible. No make-up exams will be administered without prior approval, so contact me as soon as possible if you need to miss a scheduled exam or assignment.
- **Make-up quizzes and class assignments should be completed PRIOR to the next class when feasible.**
- If class is officially cancelled for any reason, you can expect that the assignments due/taken on the missed class day will be due/taken the next time the class meets. Please also check eCampus for additional information.
- No rule can cover every situation. If you encounter extenuating circumstances, **please communicate** with me as soon as possible.

ACADEMIC INTEGRITY

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

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. For additional information please visit **http://aggiehonor.tamu.edu/**.

Academic integrity is vital to an academic community and essential for all students and professors. I will be happy to answer any questions you might have. If you ever have a question about whether or not an action would be acceptable under the honor code, please ask your professor BEFORE you take the action. If you don't have time to ask, then consider whether or not you would take the action if your professor was beside you.

For this class, I encourage you to study with your classmates (unless I specifically state otherwise). Exams and individual quizzes must be completed without any assistance from classmates or other unauthorized sources and should not be discussed with anyone who has not yet taken them yet. Other graded work (such as homework assignments, class work, and group work) can be discussed with classmates, but the work submitted must represent YOUR work and YOUR understanding of the topics. You many NOT "copy" someone else's work even if they have explained it to you. If you use a source when completing work, cite the source.

AMERICANS WITH DISABILITIES ACT (ADA)

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, currently located in the Disability Services Building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit **http://disability.tamu.edu**.

If you require accommodations, please see me as soon as possible so that we can make sure you have the necessary paperwork in order.

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.

TITLE IX AND STATEMENT ON LIMITS TO CONFIDENTIALITY

Texas A&M University and the College of Science are committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws provide guidance for achieving such an environment. Although class materials are generally considered confidential pursuant to student record policies and laws, University employees — including instructors — cannot maintain confidentiality when it conflicts with their responsibility to report certain issues that jeopardize the health and safety of our community. As the instructor, I must report (per Texas A&M System Regulation 08.01.01) the following information to other University offices if you share it with me, even if you do not want the disclosed information to be shared:

- Allegations of sexual assault, sexual discrimination, or sexual harassment when they involve TAMU students, faculty, or staff, or third parties visiting campus.
  These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared. In many cases, it will be your decision whether or not you wish to speak with that individual. If you would like to talk about these events in a more confidential setting, you are encouraged to make an appointment with the Student Counseling Service (**https://scs.tamu.edu/**).
  Students and faculty can report non-emergency behavior that causes them to be concerned at **http://tellsomebody.tamu.edu**.

COPYRIGHT OF MATERIALS

All class materials (notes, tests, assignments, reviews, solutions, etc.) are copyrighted and may not be copied or reproduced without permission.

ADDITIONAL HELP AND PREPARING FOR EXAMS

YOUR PROFESSOR

Communication is essential. Please communicate with me before class, after class, during office hours, and via email.

YOUR HOMEWORK

Your homework problems were written specifically to reinforce the material that we believe supports the objectives of the course. You should do BOTH the WebAssign and book homework problems.

YOUR CLASS NOTES

Please review your notes after each class and ask questions about anything that is not clear. Your notes will be very valuable as you study for exams as well.

YOUR TEXTBOOK

Your textbook contains very important information. I suggest that you read it. Remember that it takes longer to read a math book than a novel. You should read with your pencil in hand so you can take notes and work examples.

YOUR CLASSMATES

It is also important to communicate with your classmates. You will learn more and be able to build on each other's ideas if you discuss the material with other people. This often makes math study time more pleasant and even more productive. Please consider setting a regular time to meet.

OFFICE HOURS

Office hours are a great time and place to work on your homework and communicate with your classmates and professor. I reserve a small classroom for office hours so you have enough room to work on homework even if you do not need my help that day.

WEEK-IN-REVIEW
If you would like a review of the previous week's material, please join us Monday nights from 5:45 – 7:45 PM (Blocker 169). You can get the blank notes for each session prior to the session and the worked notes after each session from http://www.math.tamu.edu/~tcarter/Math167WIR_2019c/.

HELP SESSIONS
Help sessions are an opportunity for you to ask questions and get help with your homework. These sessions are led by students, where you may come and go, as your schedule allows. Once determined, the schedule will be announced in class, posted on our course webpage, and additionally posted at **http://www.math.tamu.edu/courses/helpsessions.html**.

ADDITIONAL PRACTICE
I strongly recommend that you practice extra problems from the book even though they are not directly for a grade. See the Homework and Extra Practice list posted in eCampus.

REVIEW PROBLEMS
Week-in-Review problems and solutions from a prior semester can be found at http://www.math.tamu.edu/~tcarter/Math167WIR_2015c/. This is an excellent source of additional practice when reviewing and preparing for quizzes and exams. I suggest that you work the problems yourself before you look at the solutions.