Instructor: Mark Farris, BO118J, 397-4193, mark.farris@mwsu.edu
Office Hours: MTWR 2:00PM-4:00PM, TR 8:30AM-9:30AM in BO111J, plus M 4:00PM-5:00PM in BO101 or by appointment

The Course: This course is designed to show ways in which mathematics has developed in the recent past and ways in which mathematics is used in modern society. The material will be presented in three independent units.

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The textbook is Excursions in Modern Mathematics 7th ed. By Tannenbaum. This is available online at pearsonmylabs.com under course ID farris93745.

Prerequisite: Math 1003 or satisfactory score on placement exam.

Grading: You will receive a grade for each of the three units. Each unit grade will be based on your best 3 out of 4 homework assignments (25%) and a unit exam (75%). In addition, each unit will have an optional writing assignment. If you choose to do a writing assignment, it will add up to 10% to your unit grade. There will be no penalty if you choose not to do a writing assignment. Your final grade for the course will be based on the average of your 3 unit grades. Letter grades will be assigned in the usual fashion: 90% for an A, 80% for a B, etc.

Homework: There will be online homework assignments for each chapter under Course ID farris93745 at pearsonmylabs.com. There is a wealth of other things on this website including an electronic copy of the textbook and sample exam problems.

Writing: You may turn in writing assignments if you chose. Only one writing grade for each unit will count. Your main objective in each of these reports should be to clearly express ideas which include mathematical content. The topics for these assignments will be chosen by each student with assistance from the instructor. These topics should be closely related to the subject matter of the unit. Suggestions for topics are given at the end of this document. A typical topic should easily be covered in 500 words of text. (This page has about 600 words on it.) Often this will need to be accompanied by pictures or formulas. This is mentioned merely as a guideline. Your papers may be shorter or longer. Each assignment will be given a score based on the following four criteria:

1. Clarity of presentation
2. Presence and correctness of mathematical content
3. Depth of coverage
4. Relationship to the ideas in the chapter.

Writing assignments may be turned in at any time, but you may turn in at most one assignment in any week. The final due date for any chapter is one week after the homework for that chapter is due.

Attendance: By registering for this course, you have made 44 doctor’s appointments with Dr. Farris. I expect you to attend every class meeting; I expect you to arrive on time; I expect you to remain in class for the entire scheduled time. If you need to miss a class, arrive late to class, or leave class early please send me an e-mail in a timely fashion indicating why you will not be or were not present. If you are absent for unexplained or frivolous reasons for a 7th time you are subject to being dropped from the course. This will not happen as long as you maintain a passing average.

If you miss an assessment activity for an unexplained or frivolous reason, there will be no opportunity to make up the missed work. If your car won’t start on the morning of an exam, you have a reason for missing class and a make-up opportunity is potentially, but not necessarily, available. But, if you don’t inform me of this in a timely fashion then your excuse will be considered frivolous.

Other: Students should refer to the current MSU Student Handbook and Activities Calendar for university policies on academic dishonesty, class attendance, student responsibilities, rights and activities.
Suggestions for writing assignments

Unit I

Any Chapter

A. Work any one Running level problem. Of course, your solution must be accompanied by an appropriate discussion of the problem you have solved.

B. Consider one of the suggestions in the Projects and Papers section or report on one of the books or articles listed in the References and Further Readings at the end of the chapter.

Chapter 1

Discuss sincerity in voting. Give an illustration showing how someone can improve the outcome of an election from his perspective by voting insincerely.

Chapter 2

Suppose 5 members of the U.S. Supreme Court decide to pre-vote on a case among themselves. Then in the full Court, each of the 5 will vote as the majority of the 5 did in the pre-voting. How does this effect the power distribution among the 9 justices?

Chapter 3

A. Consider a sealed bid problem in which Albert and Beth bid one a 1956 Thunderbird. Suppose initially that Albert thinks the car is worth $5000 and Beth thinks it’s worth $500. Suppose Beth finds out in advance what Albert plans to bid. How might Beth use this to her advantage? What are the dangers involved in Beth’s use of this information? (Hint: What if Albert finds out what Beth is up to?)

B. Consider the fair division scheme for three people such as in problem #53 in the textbook. Alter the scheme to consider unequal shares. That is, suppose A is entitled to 50%, B is entitled to 30%, and C is entitled to 20%. How should the scheme be carried out?

Chapter 4

A. In December of 1991 the Supreme Court agreed to hear a case involving a new method of apportionment known as the Dean Method. This case potentially affected the states of Montana and Washington. Research this and report on your findings.

B. Report on apportionment changes in the US House of Representatives resulting from the 2000 census.

Unit II

Any Chapter

A. Work any one Running level problem. Of course, your solution must be accompanied by an appropriate discussion of the problem you have solved.

B. Consider one of the suggestions in the Projects and Papers section or report on one of the books or articles listed in the References and Further Readings at the end of the chapter.

Chapter 5

Look up the article on The Seven Bridges of Königsberg in Newman, James R., The World of Mathematics, Vol 1. Write a report on it.

Chapter 6

Pick 8 or so cities in your home state or country. Using highway mileage for distances, look for short Hamiltonian circuits. You should consider the nearest neighbor algorithm, repeated nearest neighbor, and cheapest link.
Math 1053  Contemporary Mathematics  Suggestions for writing assignments

Chapter 7
   Problem 52.

Chapter 8
   Make up a scheduling situation. Produce a project digraph and a priority list. Schedule this using two processors. Also schedule this using 3 processors and 4 processors. Assuming that you must pay for all the processors that you use for the entire length of time that at least one processor is working; determine which is the most efficient number of processors: 2, 3, or 4.

Unit III

Any Chapter
   A. Work any one Running level problem. Of course, your solution must be accompanied by an appropriate discussion of the problem you have solved.
   B. Consider one of the suggestions in the Projects and Papers section or report on one of the books or articles listed in the References and Further Readings at the end of the chapter.

Chapter 13
   A. Explain what confounding is. Problems 41-60 may provide useful illustrations.
   B. Write an essay on experimental design. Problems 41-60 may provide useful illustrations.
   C. What is a Latin square? (Majors in social sciences might find this interesting. A little library research will be rewarded.)
   D. The 2000 U.S. Census may or may not have utilized the capture-recapture method. Recent Supreme Court decisions affect the truth of this statement. Report on this situation.

Chapter 14
   Discuss the relationship between the median and the mean. The concept of skewedness will play a role here as well as the use of examples.

Chapter 15
   Report on the Lotto Texas, the lottery drawn every Wednesday and Saturday. Explain what an individual's chances of winning are and why. Explain what the state's chances of winning are and why.

Chapter 16
   Write a report on statistical process control. (A little library research will be rewarded.)