Math for the Liberal Arts (MAT 146)
Spring 2012
Monday 5:30 – 8:15
Room D109

Instructor: Jennifer Adriano, Ed.D

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Extra help available by appointment

Prerequisite: MAT 137 or acceptable placement score

Textbook: *Excursions in Modern Mathematics (7th Edition)* by Peter Tannenbaum

Course Description: This course meets the mathematics requirement for liberal arts (non-science) transfer students. The topics covered are selected from set theory, counting and probability, and basic statistics, linear programming, game theory, Markov process, difference equations, and mathematical modeling.

Disabilities Statement: Students with disabilities who may require special accommodations or modifications are encouraged to notify the instructor within the first two weeks of class and Chris Scarborough, Learning Disabilities Specialist.

Academic Integrity Statement: Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in the course of your academic career, present only your own best work; clearly document the sources of the material you use from others; and act at all times with honor.

Class Cancellation: If the college is closed for inclement weather, the decision will be communicated on local radio and television channels, the Three River's website, and the myCommnet Alert Notification System.

Attendance: Attendance is extremely important. Students should notify the instructor prior to class when unable to attend.

Requirements: Homework and/or projects will be assigned on a weekly basis and the instructor will give credit for completed assignments. Students will be informed of the dates of exams at least one week in advance. The lowest test grade (not the final exam) will be dropped. Final grades will be computed by a point system. Students will earn points for homework, quizzes, projects, and tests. Grade Equivalents: A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62), and F (below 60).

Class Calendar:

January 23, 2012 First Night of Class
February 20, 2012 No Class – President's Day
March 19, 2012 No Class – Spring Break
May 14, 2012 Final Exam (Last night of class)

MAT 146 Course Topics:

Chapter One: The Mathematics of Voting
Chapter Two: The Mathematics of Power
Chapter Four: The Mathematics of Apportionment
Chapter Five: The Mathematics of Getting Around
Chapter Seven: The Mathematics of Networks
Chapter Eight: The Mathematics of Scheduling
Chapter Ten: The Mathematics of Money
Chapter Fifteen: Chances, Probabilities, and Odds

MAT 146 Course Outcomes:

1) Construct and interpret a preference schedule for an election.
2) Determine the outcome of an election using various methods; analyze the fairness and limitations of each election method.
3) Understand the meaning and significance of Arrow's impossibility theorem.
4) Describe and represent weighted voting systems and calculate the distribution of power in these systems.
5) Compute the Banzhaf and Shapley-Shubik power indices for weighted voting systems.
6) Identify the elements and assumptions behind the apportionment problem.
7) Implement each of the following apportionment methods: Hamilton, Jefferson, Adams, and Webster.
8) Understand the meaning of the quota rule, the Alabama paradox, and the population paradox.
9) Understand the meaning and significance of Balinski and Young's impossibility theorem.
10) Use Euler's theorems, Fleury's algorithm, and related ideas to find efficient paths and circuits in a graph.
11) Know the properties of trees and minimum spanning trees.
12) Implement Kruskal's algorithm to find a minimum spanning tree.
13) Identify and use digraphs and project digraphs to model scheduling problems.
14) Understand and apply basic digraph terminology.
15) Implement the decreasing-time and critical-path algorithms for scheduling a project.
16) Calculate percentages, simple interest, and compound interest.
17) Determine geometric sequences to predict future trends.
18) Use the following concepts to calculate the probability and odds: sample spaces, counting outcomes, permutations, and combinations.