Math 105 Course Profile

Course Objectives:

- To develop a certain level of mathematical literacy and understanding so they can make informed decisions in areas pertinent to the study of mathematics. To attain this goal we teach mathematical subjects that are relevant to everyday living.
- Apply mathematical concepts to management, social science and other real world situations.
- To incorporate writing into the curriculum. No one word answers. Students must state their justification when answering questions.
- To investigate a mock situation of purchasing a home, this includes closing cost and affordability.
- To see and understand different algorithms and methods. Algorithms and methods that produce the same outcome and others that produce different outcomes.
- To illustrate that math is suppose to make sense, be meaningful and be valuable.
- The connection between the mathematics presented and down-to-earth concrete real-life problems
- Use statistics to analyze data.
- To make charts to display data in Excel

Concepts Covered:

- Collecting Statistical Data
- Descriptive Statistics
- Money Management/Affordability of buying a house
- Graph Theory
- Voting
- Chance and Probability (optional)
- Normal Distribution (optional)
- Symmetry (optional)
- Fair game (optional)

Components of Course: (*All exams are proctored*.)

- 4 In-class Exams
- Exercise in Buying a House.
- Homework/Quizzes
- Final Exam

Course Requirements:

- Textbook: Excursions in Modern Mathematics, 4th Custom Edition for the University of Arizona by Peter Tannenbaum* (Tannenbaum 8th edition)
- Scientific calculator or higher

Concepts Covered

- In the Statistics section the emphasis is placed on how data is collected and presented, includes polling and clinical studies. Statistics includes spreadsheets and a project in excel. The spreadsheet projects are designed to help the students gain a level of computer literacy, which is becoming mandatory for success in almost any career choice.
- In Finance, the topics covered are simple and compound interest, annual percentage yield, annuities, and mortgages. We also discuss relevant issues on purchasing a home (i.e. closing costs, monthly mortgage, monthly house payment, and affordability).
- Often covered in this class are voting methods used to decide elections or situations with more than two alternatives, power index when given weighted votes, and how seats are apportioned to states for Congress. Examples used include how the site for the Olympic Games is chosen and selecting winners for the Heisman Trophy and the Academy Awards.
- Other possible topics are using graphs to find the shortest or cheapest route that can be used to design routes around areas for municipal services and delivery of mail. Probability (gambling and lottery examples) includes permutation and combinations. Other possible topic is growth and symmetry of different types in nature and designs.

Performance Objectives: Upon completion of this course, a student will be able to do the following:

- Apply mathematical concepts to management, social science and other real world situations.
- Compute the mean, median, mode, percentile and standard deviation for a data set.
- Use statistics to analyze data.
- To see how data is collected and understand the bias that might be associated with the method
- Solve interest problems using interest formulas for simple, compound and continuous interest.
- Analyze and solve problems using amortization formulas.
- Be able to know why their answer is right and be able to justify in writing what they understood.
- To know when to use a certain algorithm to find a solution and demonstrate the algorithm.
- Apply the principles of counting in problem solving situations.
- Compute theoretical and empirical probabilities.