

Math 101.003

Winter 2018

INSTRUCTOR: Steve Stein, PhD

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and upon request

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Course Summary: Math in the modern world is mathematics for students who want a better understanding of the real-life mathematics that all people face. It is especially designed for those who have struggled with mathematics in the past. The course stresses the application of mathematics to personal and social issues, rather than stressing the abstract ideas found in many mathematics courses. This course will include projects as part of the course content. The desired outcome of the inclusion of projects is to prepare students to function in real-life situations and to integrate quantitative reasoning as part of that process.

At CWU, Math in the Modern World is often selected to satisfy a General Education requirement for graduation. The course is designed to develop a student's ability to reason quantitatively in order to achieve success in their future careers and personal lives. Basic course goals include:

- Becoming familiar with techniques from many branches of mathematics.
- Developing the ability to analyze quantitative information critically.
- Investigating real-world problems creatively.
- Understanding the connections between various mathematical methods.
- Using technology to help solve problems, experiment, interpret results and verify conclusions.
- Determining the reasonableness of solutions.
- Appreciating that the procedure for solving a problem is as important as the answer.
- Communicating knowledge in both everyday and mathematical language.

Special points of interest:

- All work submitted must represent the work of the student. Students may get assistance from others during the homework but not tests. Collaborating on a test will result in at least a "0" for each student on that test and likely a failing grade for the class.

- **All Homework** is completed through MyMathLab.
- Students must register for MyMathLab (see instructions on the Syllabus tab in Canvas) .
- The class will become routine as each of the sections covered will progress in similar fashion. First, a lecture using PowerPoint slides will be covered by the instructor. Typically, this will be followed the next day by an overview of a worksheet or in class project designed to prepare students for completing the homework. Homework is assigned through MyMathLab.
- Sometime during the Unit a group project will be assigned. This project will be discussed in the lecture and typically a class period (the time allotted to the day's lesson) will be set aside for the project. It is imperative that students work diligently to complete the project with their group. The project should not be considered complete until after each group member reviews the work and agrees with the material. Real world application means we can work well with others and contribute to the completion of assigned work!
- I will be happy to do homework problems during the lecture. You must get the problems to me early enough so that I can include them in the instruction for that day.
- Be prepared for graded online tests for each section we cover in this course. These will also be completed online through MyMathLab. Problems will be similar to homework and worksheet problems. Your quizzes are timed, so fluency is important.
- There will be four chapter tests and a final exam. Both tests are timed, so students must be familiar with the material and the mathematical processes and skills that are important. For the final students will be allowed a note card, but again I stress the importance of being familiar with the mathematics involved.
- I am still working on teaching this class online and I will need your patience as I try to develop an online course that meets the needs of students as well as meets my own needs as the instructor.
- Grades will be based on a composite score from homework, tests, in class quizzes, projects the final—students generally get high scores on the homework (multiple attempts are allowed), whereas the quiz/test scores are often significantly lower!.

Necessities:

- Math is not a spectator sport—get engaged. Show up to class, participate in discussions, work diligently with your project groups and do your homework.
- Be sure to read the requirements carefully for the Projects. It is important that group members fulfill responsibilities and attend meetings!
- Textbook: *Mathematics A Quantitative Reasoning Approach, 6th Edition* (Bennet & Briggs) along with the MyMathLab access kit.
- Scientific calculator: should have graphing capabilities (I will usually use a TI-83+)
- Get help when needed.
- Communicate with the instructor using email, calling, or by visiting during office hours.

Section 1: Chapters three and five—Making Sense of Numbers (Tuition, salaries, and student enrollment at CWU).

Quiz: There are four primary topics for this section. First, you must be able to find the Percentage Change of two items (this means you need to know the absolute and relative changes). Second, be able to determine a price index of two items and also understand and be able to use the CPI to adjust a price or understand inflation. Third, from a set of raw scores, create a graphic from data in order to describe it. And fourth, if given a set of data, you should be able to interpret it and analyze the data.

Project: Compile and analyze actual data from CWU and make a determination based on the analysis. Conclusions must be substantiated and supported from the analysis.

Section 2: Applications to Finance (Credit card project)

Quiz: There are several formulas related to finance (savings and loans) that we will utilize. You must understand the differences between these and know when to use each. Formulas will be studied regarding simple interest, compound interest, savings, and loans. Each formula has a particular role and use.

Specifically, you must be able to determine the difference between simple interest and compound interest earned, be able to show the amount of principal and interest that goes toward monthly payment, calculate either one time or monthly payments needed for an investment, and finally, show the amount of payment needed to pay off a loan in a determined amount of time.

Project: We will have two projects for this section:

First: Consider a scenario where you are provided with an annual income and several expenses. Using appropriate formulas, determine if you are able to purchase a house and if so, what is the amount of house you could afford.

Second: Consider three different credit card scenarios in order to recommend to a fictitious client which card they should accept.

Section 3: Voting

Quiz: There are several techniques discussed in relation to voting techniques. Be familiar with each and able to demonstrate the proper use of each one. Also, it is valuable to understand what constitutes a fair vs. unfair election. Be able to state whether an election is fair and support your position. In addition, demonstrate proper procedures related to the different apportionment methods and evaluate the order strength or weakness of the procedure.

Project: A brief essay. Consider voting techniques, fairness of voting and apportionment to

discuss what you see as the important issues related to these things in terms of mathematical applications.

Section 4: Linear and Exponential Growth and Modeling (Bunny rabbit project)

Quiz: Students must be able to determine linear or exponential growth from data sets. In addition, students need to create a mathematical equation (with use of a calculator) that models the function and also be able to find a graph of the function (again, with use of the calculator.)

Project: Consider a situation where rabbits reproduce in a perfect environment and predict the population after 24 months. Next, determine a mathematical equation that will model the growth. Finally, predict the population after 30 and 60 months of growth based on the mathematical model you developed. In addition, provide a brief narrative describing the weakness of the scenario.