DEPARTMENT OF MATHEMATICS
COLLEGE OF THE SCIENCES
CENTRAL WASHINGTON UNIVERSITY
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Math 101- Math in the Modern World

Dr. Steve Stein Email: steve.stein@cwu.edu

Cell: 509 929 2019

Course Materials:

Textbook. Math For Liberal Arts/Quantitative Reasoning. David Lippman

Course Objectives: This course is designed to develop the power and habit of mind to search out quantitative information, critique it, reflect upon it, and apply it to one's public, personal, and professional life. Students will learn to analyze complex content settings such as comparing national debt over time; comparing tuition increases to per capita income; identifying poorly constructed arguments in the media; understanding apportionment in the U.S. House of Representatives. To analyze this information, students will use math skills such as percent change; relative and absolute change; reading graphs; proportional reasoning; simple and compound interest.

Course requirements will be met by turning in completed worksheets, online homework, tests (quizzes) and projects. Additionally, students should expect to have several (virtual meetings where a quiz will be given.

Grading

Grades will be assigned using 90% - 100% = A 80% - 90% = B 70% - 80% = C 60% - 70% = D; + and – grades apply if your score is within 2%

Grades are based on a sum of all tests, assignments, homework, and projects.

Academic Honesty: The integrity of students and their oral and written work is a critical component of the academic process. All written work submitted in this course will be individual work unless otherwise directed by the instructor. Students must properly document all outside sources used for outside of class assignments.

Course Policies:

Please contact me in advance for extensions and I will do all that I can to meet your needs. Requests to accept late work after-the-fact most likely will not be honored.

Request for Disability Modifications: I will follow the expectations of the university related to all necessary and approved modifications. I want every student to do well.

Inclusiveness Statement: Mutual respect amongst all class members must take place at all times. No bullying, harassment, or discrimination of any type will be allowed. I commit to make every student feel

part of the class, feel wanted, and feel that I want to help them achieve their very best. If any student ever feels otherwise, please bring it to my attention.

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 every day and mathematical language

The class will become routine as each of the sections covered will progress in similar fashion. 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 designed to prepare students for completing the homework. Once the worksheet for the section is completed the homework is "assigned" and needs to be completed prior to the beginning of the next section's homework. Sometimes a "section quiz" will be given upon completion of homework. Homework will be through WAMAP.org, which is an OpenText. Here is my disclaimer that this is the first time I am using this text and I am trying to modify it to fit what I have. I think the value of the text (e-edition is free) is worth the struggles at this point.

Sometime during the Unit, a group project will be assigned. 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!

- Homework is assigned and is to be completed online via WAMAP.
- I will be happy to do homework problems on video or in a zoom meeting. You must get the problems to me early enough so that I can review them (I have not used the text before).
- Be prepared for graded quizzes for each section we cover in this course.
- In addition, students will be required to meet with the instructor in a "virtual meeting" and likely be given a brief quiz. Students must schedule and meet with the instructor and also have the ability to discuss (microphone and speakers) and write (pen/stylus) with the instructor!
- There will be four section tests (quizzes) and a final exam. I try to be receptive to students'

Necessities:

- Complete all assignments in a timely manner or get an extension in advance.
- Scientific calculator: should have graphing capabilities (I will usually use a TI-83+)
- Communicate with the instructor using email, calling, or by visiting during office hours.

Content
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.