Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: MAT
Course and Section #: 1030-X02
Course Title: Quantitative Reasoning QL
Credits: 3

Course Description

Upon completion of this course, students should be able to communicate, interpret, and analyze quantitative information found in the media and in everyday life to make sound personal, professional, and civic decisions.

Course Attributes

This course has the following attributes:
☒ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☐ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective
Other: *Click here to enter text.*

Instructor Information

Instructor Name: Jon Anderson

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Explain real world information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words), including making reasonable predictions of trend data.
2. Convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words) that are appropriate and accurate.
3. Perform calculations that are sufficiently comprehensive and elegant (clear, concise, etc.) to solve authentic problems.

4. Analyze real world data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions.
5. Make and evaluate important assumptions in estimation, modeling, and data analysis using a compelling rationale for why each assumption is appropriate.
6. Express quantitative evidence in support of an argument or specific purpose (in terms of what evidence is used and how it is formatted, presented, and contextualized).

Course Materials and Texts

REQUIRED SOFTWARE LICENSE: In this class, it is required to have a software license for MyMathLab. If you opted in to Wolverine Access, you already have access to MyMathLab. If you opted out, you will need to purchase a MyMathLab license. If you are in this second category, please contact me directly - not all access codes will work for this course. I want to make sure you get the right one. *Do not purchase an access code until you verify with me that you need to!*
TEXTBOOK 1 (Optional): *Using and Understanding Mathematics: A Quantitative Reasoning Approach;* Jeffrey Bennett - Please note that this textbook is already included in the MyMathLab portion of the class. ***You are not expected to purchase the textbook!*** It is included in the MyMathLab content for the course.
TEXTBOOK 2 (Optional): *Math in Society*; David Lippman - Please note that this textbook is already included in the READ portions of Canvas. ***You are not expected to purchase the textbook!*** Portions of this textbook are included already in the READ sections of the Canvas Modules.
Microsoft Office Account (Required): We will be making extensive use of the Microsoft Office suite, especially Excel and Word. Fortunately, as UVU students, you have access to this suite free of charge. Access is supposed to be automatic, but if you have issues accessing it, please visit UVU's Microsoft Office 365 page (Links to an external site.) to get your access. It is your choice on whether to use the Online version of the course as opposed to the Desktop applications. I would encourage you to use Online for most of your work, but there are a few things that the desktop version does better. You will need this same account to use Microsoft Teams for any group meetings your group has, or if you need to attend class from home. Your login name and password to Teams are the same as for myUVU.
Webcam (Required): You will need a simple webcam to facilitate communication with the class, communication with your group, and to have your test proctored.

Course Requirements

Course Assignments, Assessments, and Grading Policy
Individual Work. Students will learn by reading the textbook, attending class lecture, and completing homework exercises. This is where students will receive most of the learning that occurs in the class. I recommend that you engage with this material early in the week to allow time to work with your group on the group work.
The material is divided in to learning modules, one for each week of the semester. Most learning module consists of a READ page, where the textbook has been posted inside of Canvas. Each READ page has a link to a playlist containing a series of short lectures from a previous semester related to that reading. You are welcome to choose either the reading or the videos to help you learn.

The reading for each lesson often contains information found in various sections of a math textbook. They have been collected into a single page, with the different sections separated by tabs. You can move from section to section by clicking on the appropriate tabs. The math textbook has been selected because it includes written instructions, worked examples, video explanations, and even practice problems so that you can practice what you are learning before working on the homework yourself. These practice problems do not have to be completed, and completion is not tracked.
The videos are collected into a playlist of related videos. These videos are placed into the playlist in order, and often build off of each other. Most videos are between two and five minutes in length, and are designed to allow breaks between moving on in the content. There are a different number of videos for each playlist. Watching these videos can be beneficial to you, but is not required.
You are expected to work on the homework for each section individually. You are allowed to work with your group, but each individual will receive their own problems and must submit their own work.
Some projects will either have an individual portion each person must complete to get credit or is intended to be done by each individual. You will only receive credit if your portion is done for the project.
Group Work. Each week, you will be asked to work on either a mini-project tied to that week's learning or to a major project which combines material from the three previous weeks, making connections in the material you have been learning. You are expected to work with your group on each project, either at the same time in Teams meetings or at different times through appropriate communication channels, to accomplish these assignments. Some projects have individual submissions, but students may work together so long as each does their own work.
The weeks that contain mini-projects have a basic flow of completing several steps related to the project followed by a reasoning/essay style question. All mini-projects that have a single submission from the group are found in your group Teams channel and will be submitted through Canvas. Only one person in the group needs to submit a group project. Any individual project will need to be downloaded from Canvas, completed, and submitted individually. Please check the Submission portion of each mini-project to make sure that you are submitting what you need to submit.
The major projects are culminating assignments that tie several topics from a unit together. Each project consists of a group portion, where your group will make decisions that will impact the outcome of your project. These projects give you major freedom in what topics, designs, and research you perform, but provide structure to your work. Once the group portion is completed, each student individually is expected to reflect on what they have learned and will complete an individual reflection.
As you work with your group, please don't hesitate to reach out to myself for help. I am here to help you succeed!

Activity	**Percent**
Homework	20%
Mini Projects/Reflections	20%
Participation	10%
Major Projects	25%
Final Exam	25%

Required or Recommended Reading Assignments
All required readings use chapters from the course text that align with the lectures below

General Description of the Subject Matter of Each Lecture or Discussion

Part One Logic and Problem Solving

Chapter 1: Thinking Critically

- 1A: Living in a Media Age (Optional)
- 1B: Propositions and Truth Values (Optional)
- 1C: Sets and Venn Diagrams (Optional)
- 1D: Analyzing Arguments (Logical Fallacies Required)
- 1E: Critical Thinking in Everyday Life (Optional)

Chapter 2: Approaches to Problem Solving

- 2A: Understand, Solve, and Explain
- 2B: Extending Unit Analysis
- 2C: Problem-Solving Hints

Part Two Quantitative Information in Everyday Life

Chapter 3: Number in the Real World

- 3A: Uses and Abuses of Percentages
- 3B: Putting Numbers in Perspective
- 3C: Dealing With Uncertainty
- 3D: Index Numbers: The CPI and Beyond (Optional)
- 3E: Numerical Surprises: Polygraphs, Mammograms, and More (Optional)

Chapter 4: Managing Money (Required)

- 4A: Taking Control of Your Finances
- 4B: The Power of Compounding
- 4C: Savings Plans and Investments
- 4D: Loan Payments, Credit Cards, and Mortgages
- 4E: Personal Income Taxes (Optional)
- 4F: Understanding the Federal Budget (Optional)

Part Three Statistics and Probability

Chapter 5: Statistical Reasoning

- 5A: Fundamentals of Statistics
- 5B: Should You Believe a Statistical Study?
- 5C: Statistical Tables and Graphs
- 5D: Graphs in the Media (Optional)
- 5E: Correlation and Causality (Optional)

Chapter 6: Putting Statistics to Work

- 6A: Characterizing Data
- 6B: Measures of Variation
- 6C: The Normal Distribution
- 6D: Statistical Inference (Optional)

Chapter 7: Living with the Odds

- 7A: Fundamentals of Probability
- 7B: Combining Probabilities
- 7C: The Law of Large Numbers
- 7D: Assessing Risk
- 7E: Counting and Probability

Part Four Modeling

Chapter 8: Exponential Astonishment

- 8A: Growth: Linear versus Exponential

8B: Doubling Time and Half-Life (Optional)
8C: Real Population Growth
8D: Logarithmic Scales: Earthquakes, Sounds, and Acids
Chapter 9: Modeling Our World
9A: Functions: The Building Blocks of Mathematical Models
9B: Linear Modeling
9C: Exponential Modeling
Chapter 10: Modeling With Geometry (Optional)
10A: Fundamentals of Geometry
10B: Problem Solving with Geometry
10C: Fractal Geometry
Part Five Further Applications (Optional)
Chapter 11: Mathematics and the Arts
11A: Mathematics and Music
11B: Perspective and Symmetry
11C: Proportion and the Golden Ratio
Chapter 12: Mathematics and Politics
12A: Voting: Does the Majority Always Rule?
12B: Theory of Voting
12C: Apportionment: The House of Representatives and Beyond
12D: Dividing the Political Pie
Chapter 13: Mathematics and Business
13A: Network Analysis
13B: The Traveling Salesperson Problem
13C: Scheduling Problems

Required Course Syllabus Statements

Generative AI
Generative AI is an incredibly powerful tool. However, it is just that, a tool. I have used the tool myself to help craft questions and refine my writing, but I have found that it is not always accurate when it comes to the work it provides, particularly when it comes to math. Use Generative AI as a learning assistant and not as a crutch. If you use it, cite it in your work (leaving a comment is fine on submissions since I provide Excel files and you don't always have the ability to add text to the files). You are responsible to make sure that any content says what you want it to say. Don't accept ANYTHING at face value without checking it critically. If Generative AI helps you learn some things faster, great! Just remember, if you REALLY want to be good, you have to work for it. Use of Generative AI to replace coursework of any type will result in a 0 on that assignment. Use of Generative AI for any exam, practice or not, will result in a 0 on the entire exam. Unapproved uses of Generative AI will also result in a report to the Dean of Students.

Using Remote Testing Software
☐ This course does not use remote testing software.

☒ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX
Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis

protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.

To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.