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 #: 1030-011
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

Homework:
Homework will be done online using Pearson's MyLab system. Due dates are listed on both the modules page and inside the MyLab system. Homework is graded directly by MyLab, and is graded on an individual question basis. Each part of each module contains a single homework assignment, and assignments vary from 10 to 20 questions. The system allows students to work on homework late, so you can receive credit after the due date.

Note: Grades are sent at specified time intervals between Canvas and MyLab. If you get a grade notification while actively working in the homework, just keep working and the grade will be updated again when you have finished.
Note: Because MyLab is a third party system, you cannot access it from the gradebook. You must access MyLab assignments from the modules page in order to work on the assignment or improve your grades.

Mini Projects:

Most weeks with content have one mini-project attached to them. Most mini projects are expected to be completed as groups, though many will have individual portions that each student needs to complete on their own. A few mini-projects must be completed by each individual in order to receive credit. All mini-project information can be found in Canvas with the base template found in your group's Team channel for group work or downloadable from Canvas for individual projects. All assignments will require using Excel to complete. All mini-projects are submitted in Canvas. You can use the Excel app or Excel online to complete the assignments.

Mini projects that are submitted on time but do not receive full credit may be reworked to receive up to full credit by continuing to work on them. The sooner you do so, the better. Any mini project that is not submitted on time will result in a 0. It is possible to work on the late mini-projects, but this generally takes time away from current projects and should be a last resort.

I do not apply late penalties on projects that are turned in late.

Participation:

Students earn credit by participating in the course, individually by completing homework assignments and with their group by completing projects, during the week. To earn participation points, each student must contribute to the project in a meaningful way, as outlined in Module 1. Students must also complete their homework by Sunday night to get full participation credit for the week. Failure to participate with your group may result with a 0 for the assignment and a 0 for that week's participation grade. The lowest three participation grades will be dropped at the end of the semester.

Participation grades **cannot** be made up. You can challenge them on the points themselves, but you cannot make up a week in which you did little to no work on time. A higher penalty will be applied the more weeks in a row have incomplete work. Generally, I take off two points for a lack of homework completion, 1 point if homework was attempted but not completed, and 2 points for a missing project. This can be reset each week - past late assignments do not impact current weeks and a fully completed week will reset the participation grade back to 10 points.

Major Projects:

Major projects build off of the knowledge gained from each section and the work done in the mini projects. They are intended to be completed as a group, although each also contains an individual reflection and potentially individual work, as well. There will be three major projects throughout the semester. These projects are more in depth and require more research and decision making on the part of the group. Submissions for each project are explained on that project's page. See each project for more information.

Major projects may be submitted late. These projects are where we expect you to do the most work - they tie in skills learned in homework and concepts covered in lectures. They are also the best preparation for the final exam. You can make up lost points and turn in the assignment late, but it is your responsibility to complete the assignment correctly to get credit. You can also rework the assignment based on feedback received and earn a higher score. No penalty is applied to late submissions, but it is in your best interest to get the work done on time and to make corrections as soon as possible.

Final Exam:

The Developmental Mathematics department provides a final exam for all MAT1030 and 1035 students. All students in this course will take this exam individually. The exam consists of questions that check both the skills and reasoning of students on the major topics listed below.

- Unit Analysis
- Financial Mathematics
- Linear and Exponential Modeling
- Statistics
- Probability

Problem solving is tested by the way that students approach the problems related to the above topics. Students will be given problems that include finding mathematical solutions as well as reasoning about those solutions. This usually includes essay questions that require thoughtful responses. The department is not only interested in your ability to perform calculations but also in interpreting those calculations and making meaningful decisions.

The test will be given in Canvas and will administered through the Proctorio system. Details related to using Proctorio will be given closer to the Final Exam. Proctorio requires the use of a Webcam.

To help prepare for the final exam, you will be provided with practice exams that cover all modules you have worked through that have not been covered by previous practice exams. These practice exams will also use Proctorio and can serve as a way to prepare for both the content, style, and proctoring of the final exam. These practice exams are worth extra credit and cannot be made up after they have concluded. No practice exam may be taken late.

There is also a final exam review that will become available once the third major project is available.

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.