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 #: 1030-005
Course Title: Quantitative Reasoning QL
Credits: 3

Course Description

Teaches how 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: Dr. Ka Lun (Allan) Wong

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).
7. Use algebra to support objectives 1-6.

Course Materials and Texts

REQUIRED SOFTWARE LICENSE: In this class, it is required to have a software license for MyLab Math. You can purchase access to just the online homework system online by clicking on Access Pearson of the left menu of Canvas ($50). Alternatively, you may be able to find the access code sold in the UVU bookstore. There are step-by-step instructions on how to access MyLab Math on the Getting Started in MyLab Math (https://uvu.instructure.com/courses/600147/pages/getting-started-in-mymathlab) page
Microsoft Office Account (Required): We will be making extensive use of the Microsoft Office suite, especially Excel, Word, and Teams. Fortunately, as UVU students, you have access to this suite free of charge. Please visit UVU's Microsoft Office 365 page (https://ais-linux6.uvu.edu/office365/) to get your access. I also strongly encourage using the Desktop applications over the Online version, especially when you use Teams, as it has a better feature set.
Webcam (Required): You will need a simple webcam to facilitate some communication with your group and to be proctored on the exams.

Course Requirements

Course Assignments, Assessments, and Grading Policy
Your time is divided into five different categories:
Learning. Students will learn by watching the videos, reading the textbook and completing the learning checks. Points will be earned by completing inclass assignments. Often students will participate in a group project that will occur at a time that the group selects. A great deal of the learning will be done through watching videos. Learning checks will occur at the end of each section and will require answering a few questions to clarify whether you have been watching the videos.
Projects. Projects are both done by the individual and in groups. Projects are where students apply course concepts, make decisions, and clarify questions. Projects make up a great deal of the credit in this course
Projects can be culminating assignments that tie several topics and chapters together. Each project includes major freedom in what topics, designs, and research you perform, but provides a general structure for your work. The projects may be found in Teams, or in the assignment in Canvas. If you miss a group project, you may make it up, but you will have to do so individually.
Each week consists of at least one project. Projects may be completed as a group, or as an individual. Projects will be CLEARLY marked as to whether it is an individual project or a group project. All project information can be found in Canvas, although many rely on other tools, such as Word or Excel for completion. Group projects are submitted in Teams. Individual projects are submitted in Canvas. Projects that are submitted on time but do not receive full credit may be reworked to receive up to full credit within two weeks of the original due date. Further credit not received may be reworked at the discretion of the professor, with applicable timelines presented via Canvas messages. Any project that is

not submitted on time may result in a 0, unless adequate documentation is provided as explained above under the Late Work Statement.
Homework. Students will practice concepts by completing the MyLab Math homework and reading the textbook. This learning should be completed regularly. Setting aside time each day to complete homework will ultimately lead to a better mastery of the content. Late homework will be accepted until the last day of classes, for a 20% penalty.
Quizzes (Final Exam Prep). These quizzes are found in Canvas and are built to prepare you to be successful on the final exam. Each quiz consists of 1 - 4 problems and requires describing your work and defending your judgement with data. Late quizzes will not be accepted.
Final Exam Prep Quizzes are one to four question quizzes are written and built to prepare you for the types of questions that will be asked on the final exam. You are expected to perform mathematical calculations, make appropriate decisions, defend those decisions with logical arguments and communicate with correct mathematical notation. These quizzes will be vital in preparing you for the final exam. They are completed one every other week and are due on Sunday nights.
End of Section Wraps. These assignments are done in Canvas and are reflective assignments that help students to determine how their learning is going and what changes they might make to be more successful in the class. End of section wraps are designed to help you to reflect on your learning. These 4-5 question reflective assignments are done on your own time and are found in Canvas
Tests: There will be four tests given throughout the semester. Due dates for each exam are listed in Canvas. Tests will be done online through MyLab Math. You are allowed five attempts on all tests.

Final Exam:
The Mathematical and Quantitative Reasoning department provides a final exam for all MAT1030 students. All students in this course will take this exam. The exam consists of questions that check both the skills and reasoning of students on the major topics listed. Unit Analysis Financial Mathematics Linear and Exponential Modeling Statistics Probability Problem-solving 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. To help prepare for the final exam, you will be provided with a review that cover all modules you have worked through that have not been covered by previous practice exams.

Activity	Percent
My Lab Math Homework	20%
Classwork and Learning Checks	7%
Projects	15%
Quizzes (Final Exam Prep)	18%
End of Section Wraps	3%
Tests (4)	12%
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

This course requires you to complete assignments that assess your understanding and application of the material. You are expected to do your own work, and the use of artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, is strictly prohibited for any part of your assignments. Using these tools will be considered academic dishonesty and will be handled according to the university's policy. If you have questions about acceptable use of AI tools, please consult the instructor before submitting your work.

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.