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-X01
Course Title: Quantitative Reasoning
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: Lindsey Gerber, Ph.D.

Student Learning Outcomes

This capstone math course is designed to present mathematical thinking as a tool for solving everyday problems. Emphasis is placed on authentic contexts, which will introduce the concepts of numeracy, proportional reasoning, dimensional analysis, rates of growth, personal finance, consumer statistics, practical probabilities, and mathematics for citizenship. It is intended to prepare students as consumers and as members of society to think critically about quantitative statements and to recognize when these statements are misleading or false. Upon completion of this course, students should 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

Denley, K. (2023). *Viewing Life Mathematically: A Pathway to Quantitative Literacy, 2nd Edition. Hawkes Learning Systems, Inc. ISBN: 978-1-64277-496-2*

Scientific Calculator

Course Requirements

Course Assignments, Assessments, and Grading Policy
Hawkes Homework Score (20%)
Practicing the concepts presented in the course material is important to achieve the student learning outcomes. Your practice will be recorded using the Hawkes Online homework system. The homework assignment will be due on the **Module Quiz days** at 11:59pm. There are strict deadlines enforced through the software, although you will be allowed to work and change your score after the due date with a late submission penalty of 10%, with a required final submission prior to the final exam. See Assignments tab and/or the software for due dates. Homework is worth 20% of the total grade.

Projects/Activities (20%)
There are **four** projects to be completed by you. These are to be submitted in CANVAS. Project 4 has multiple due dates due to feedback on progress throughout the project. See the calendar or CANVAS for due dates. The projects are worth 20% of the total grade.

Module Quizzes & Open-Book Exams (15%)
This percentage includes eight module quizzes and 4 open-book tests. In addition, there will be one extra credit canvas quiz to prepare you for the mid-term Proctorio exam. The quizzes and tests are open book and notes. The score is worth 15% of your overall grade.

Mid-Term Exam (20%)
The mid-term exam will be given online using Proctorio. You can take the Mid-term Exam from Thursday, March 27th to Sunday, March 30th. It will be on CANVAS and will be covering Modules 1 - 7. (Look at the schedule). There are no retakes on the mid-term exam. If you are not able to take the Mid-Term exam during the available time, please inform me ahead of time to make other arrangements.
On the mid-term exam, **NO note cards, formulas, or books are allowed on the exam. You are allowed to use a scientific or graphing calculator and scratch paper. For partial credit on the multiple-choice portion of the test, you can upload your scratch paper in CANVAS. A formula chart will be provided.**

Final Exam (25%)
The final exam (UVU Policy) is comprehensive (Department of Mathematical and Quantitative Reasoning policy). The final exam is worth 25% of the total grade. The final exam will be given online using Proctorio. It will open Friday, April 25th and close Sunday, April 27th at 11:59pm.

Links to an external site. On the final exam, **NO note cards, formulas, or books are allowed on any exam (Department of Mathematical and Quantitative Reasoning policy). You are allowed to use a scientific or graphing calculator and scratch paper. For partial credit on the multiple-choice portion of the test, you can upload your scratch paper in CANVAS. A formula chart will be provided.**

For extra credit on the final exam, you must complete the SRI survey and submit the receipt number on CANVAS. This should open approximately 2 weeks before the end of the semester. The SRI assignment will be open until Wednesday, April 27th at 11:59pm.

Grading Scale: This scale represents your percentage of total points

A	**100-94%**	**B-**	**82-80%**	**D+**	**69-67%**
A-	**93-90%**	**C+**	**79-77%**	**D**	**66-63%**
B+	**89-87%**	**C**	**76-73%**	**D-**	**62-60%**
B	**86-83%**	**C-**	**72-70%**	**E**	**< 59%**

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

Module 1 – Critical Thinking & Problem Solving (Chapters 1.1 – 1.3)
In this module, students learn about inductive and deductive reasoning. In addition, they learn how to estimate in real world context such as budgeting for a party or estimating based on graphs. Lastly, in this section, students will understand different problem-solving strategies such as drawing pictures, developing tables, guess and check, etc.

Module 2 – Set Theory (Chapters 2.1 – 2.4)
In this module, students learn about set theory. From basic set notation to operations with sets and finishing up with applications solved using Venn Diagrams.

Module 3 – Logic (Chapters 3.1 – 3.2, 3.4)
In this module, students learn about truth tables and the different fallacies.

Project 1: Fallacies in the Real World
Test 1: Modules 1 - 3

Module 4 – Rates, Ratios and Percents (Chapters 4.1 – 4.3)
In this module, students learn about rates, ratios and percentages. They are discussed and evaluated in real-world context.

Module 5 – Measurement (Chapters 4.4, 7.4 – 7.5)
In this module, students learn to convert between different types of measurements (i.e. meters to feet). Students use the U.S. and metric conversion tables and unit analysis to convert between the various measurements.

Project 2: Vacation Travel Calculations
Test 2: Modules 4 – 5

Module 6 – Mathematical Modeling (Chapters 5.1 – 5.2, 5.7)
In this module, students will explore linear and exponential modeling. They will know how to construct the different equations, create a table and graph as well as solve for various parts of the equation. To do this, students will not only understand the order of operations but logarithmic functions too.

Module 7 – Financial Mathematics (Chapters 6.5, 6.1 – 6.3)
In this module, students will learn about budgeting, savings, and debt. They will look at simple interest and compound interest formulas as well as annuity and amortization formulas.

Project 3: Mortgage Project
Test 3: Modules 6 – 7

Module 8 – Fundamentals of Probability (Chapters 10.1 – 10.4)
In this module, students will learn about probability, which includes basic probability, single event probability and multiple events probability. Lastly, students will learn about expected value.

Module 9 – Statistics (Chapters 11.1 – 11.4)
In this module, students will understand how to collect, display and analyze data. In addition, they will learn about the normal distribution and finding z-scores.

Project 4: Research Project
Test 4: Modules 8 – 9

Required Course Syllabus Statements

Generative AI
**adapted from Temple University Links to an external site. statement on AI in classes.*

AI programs are not a replacement for your human creativity, originality, and critical thinking. Writing, thinking, and researching are crafts that you must develop over time to develop your own individual voice. At the same time, you should learn how to use AI and in what instances AI can be helpful to you.

The use of generative AI tools (e.g. ChatGPT, Google Bard, etc.) is permitted in this course for the following activities:

- Brainstorming and refining your ideas;

- Fine tuning your research questions;
- Finding information on your topic;
- Drafting an outline to organize your thoughts; and
- Checking grammar and style.

The use of generative AI tools is not permitted in this course for the following activities:

- Impersonating you in classroom contexts, such as by using the tool to compose discussion board prompts/responses assigned to you or content that you put into a Teams/Canvas chat.
- Completing group work that your group has assigned to you, unless it is mutually agreed upon that you may utilize the tool.
- Writing a draft of a writing assignment.
- Writing entire sentences, paragraphs or papers to complete class assignments.

You are responsible for the information you submit based on an AI query (for instance, that it does not violate intellectual property laws, or contain misinformation or unethical content). Your use of AI tools must be properly documented and cited in order to stay within university policies on academic honesty. Any student work submitted using AI tools should clearly indicate what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, please reach out to me for a conversation 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.