

Quantitative Reasoning

MATH-114

Spring R 2025 Section 002 01/13/2025 to 05/09/2025 Modified 03/14/2025

Meeting Times

Lecture

Monday, Wednesday, Friday, 9:20 AM to 10:10 AM, DH 2443

Contact Information

Assistant Professor: Mr. Andrew Harrison Volk

Email: ahvolk@liberty.edu

Office: DH 4284N

Phone: 4348415810 (cell)

Website: <https://www.youtube.com/c/LearnAbundantly>
(<https://www.youtube.com/c/LearnAbundantly>).

Office Hours

4th Floor Demoss DH 4284N

Tuesday (8:15am - 12:15pm)

Thursday (8:15am - 12:15pm)

Friday (1:00pm - 3:00pm)

Course Description

Applying mathematical tools and analysis to practical context, particularly focusing on using proportions and ratios. Basic statistical tools are developed and employed, including graphs, descriptive statistics, the normal curve, the basics of inferential reasoning and investigating correlation. Financial applications are particularly emphasized, as is the use of spreadsheets.

Requisites

PLMA of 70-74 OR MATH 100 (Minimum grade of C).

It is the student's responsibility to make up any prerequisite deficiencies, as stated in the Liberty University Catalog, which would prevent the successful completion of this course.

Rationale

MATH 114 is designed to help the student use mathematics to accurately apply numerical information. The student will learn critical thinking skills, particularly with sophisticated applications of rudimentary mathematical ideas to numerical contexts of everyday life. This is not just in the financial realm, but also other areas where quantitative data is prevalent (from medical studies to energy usage to academic achievement).

Course Learning Outcomes

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

- A. Apply biblical principles to the study of mathematics.
- B. Apply fundamental mathematical concepts and formulas to financial questions regarding investments, comparative costs, and related applications.
- C. Formulate solutions to practical problems applications using ratios and proportions.
- D. Utilize graphical displays to make accurate conclusions.
- E. Compute basic statistical quantities for correct analysis of data sets.
- F. Construct spreadsheets that employ formulas to derive numerical results.
- G. Analyze real-world situations involving mathematical data and make decisions accordingly.

Foundational Skills Learning Outcomes

General Education Foundational Skill Learning Outcomes (FSLO): Technological Solutions and Quantitative Reasoning (TSQR)

TSQR 1: Analyze data and inform action through a structured method.

TSQR 2: Predict the output based on an input in practical scenarios using technological solutions and/or quantitative reasoning.

TSQR 3: Apply the skills needed for successful financial stewardship in various contexts.

TSQR 4: Demonstrate computational and estimating skills in practical situations.

TSQR 5: Relate technology and quantitative reasoning to participation in God's redemptive work.

Course Resources

1. *This class is inclusive access and requires no textbook purchase or purchase of online materials.*

2. *Optional:* A scientific calculator.

Use of calculators on cell phones, PDA's, etc. is not permitted.

However, students will be allowed to use Microsoft Excel and Desmos.com

3. *Recommended:* A notebook to keep course documents and homework.

Course Assignments

Cognitive Growth

Demonstrate ability to utilize the knowledge acquired by successfully working through applications in business and science.

Product

1. Class Meetings:

All electronic devices must be turned off during class unless the professor specifically requests they be used for participation activities.

2. Homework, Test/Final Exam Reviews:

All homework assignments are in MyLabs. Each assignment may be attempted an unlimited number of times before the due date. Assignments may be submitted late but are penalized. Help Me Solve This buttons are available on most of the exercises.

This assignment aligns with the following:

CLOs: A, B, C, D, E, F, G

FSLOs: TSQR 1, 2, 3, 4

3. Quizzes:

All quizzes are in MyLabs. There are two attempts available for each quiz. Quizzes will not have help buttons.

This assignment aligns with the following:

CLOs: A, B, C, D, E, F, G

FSLOs: TSQR 1, 2, 3, 4

4. Projects (3)

These projects will apply course concepts to real-life situations and further explore topics introduced in the text. Projects will also incorporate spreadsheet tasks to further develop the student's ability to utilize this tool to investigate mathematical questions.

This assignment aligns with the following:

CLOs: A, B, C, D, E, F, G

FSLOs: TSQR 1, 2, 3, 4

5. Tests:

Tests will be administered in class.

This assignment aligns with the following:

CLOs: A, B, C, D, E, F, G

FSLOs: TSQR 1, 2, 3, 4

6. Final exam:

The two-hour final exam is comprehensive.

This assignment aligns with the following:

CLOs: A, B, C, D, E, F, G

FSLOs: TSQR 1, 2, 3, 4

Process

1. Student attends class every week.
2. Student works as many additional hours as necessary to complete the assignments due each week.
3. Student meets with instructor when necessary.

Academic Integrity

- All work submitted in the course must be your own. Therefore, verification of your work may be required either verbally or in written form. Failure to verify your work will result in the deletion of that assignment and you will be required to redo the work with all steps clearly shown. The use of any other websites, website functions, or apps that solve mathematical problems for you is not permitted and is an honor code violation.
- During an in-class exam, the use of your notes, homework, quizzes, reviews, etc. in or from MyLabsPlus is not permitted and is an honor code violation.

✓ Course Grading

Course grade will be determined by the following point system:

*Includes 10 points extra credit.

Assignment Categories:	Category Weight:
Course Requirements Checklist (1)	(10 points)
Projects (3)	75 points
Homework and Test Reviews (15)	300 points
Quizzes (11)	110 points
Tests (3)	375 points
Final Exam (1)	140 points

Late Policy for Homework & Projects

Course Assignments should be submitted on time.

If the student is unable to complete an assignment on time, then he or she must contact the instructor prior to the assignment due date.

Assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions:

1. Late assignments submitted within one week after the due date will receive a 10% deduction.
2. Assignments submitted more than two weeks late or after the final date of the course will not be accepted.

Special circumstances (e.g. death in the family, personal health issues) will be reviewed by the instructor on a case-by-case basis.

Late Policy for Quizzes and Tests

- All quizzes must be completed in MyLabsPlus by the due dates.
- Each test will be administered during the class period on the date indicated. You must be in class on the date of the test in order to take it or have made prior arrangements with the instructor if you will be absent on the date of the assignment.
- The Late Policy below applies only to homework, projects, and test reviews. It does not apply to quizzes and in-class tests.



Policies

Disability Assistance

Students with a disability and those with medical conditions associated with pregnancy may contact Liberty University's Office of Disability Accommodation Support (ODAS) at ODAS@liberty.edu or in DeMoss Hall 1264 for accommodations. Such accommodations require appropriate documentation of your condition. For more information about ODAS and the accommodations process, including how to request an accommodation, please visit www.liberty.edu/disabilitysupport. Requests for accommodations not related to disabilities or pregnancy must be directed to the Registrar's Office, which generally handles medical needs support.

For all disability testing accommodation requests (i.e. quieter environment, extended time, oral testing, etc.) Testing Services (DeMoss Hall 1036) is the officially designated place for all tests administered outside of the regular classroom.

If you have a complaint related to disability discrimination or an accommodation that was not provided, you may contact ODAS or the Office of Equity and Compliance by phone at (434) 592-4999 or by email at equityandcompliance@liberty.edu. Click to see a full copy of Liberty's [Sexual Misconduct Policy](https://libertyedu.public.na2.doctract.com/doctract/documentportal/08DC692F33B9227E70CCCB1A5568E829) (<https://libertyedu.public.na2.doctract.com/doctract/documentportal/08DC692F33B9227E70CCCB1A5568E829>) or the [Student Disability Grievance Policy and Procedures](https://libertyedu.public.na2.doctract.com/doctract/documentportal/08DD60AD964F7777426BC3C79B77382A) (<https://libertyedu.public.na2.doctract.com/doctract/documentportal/08DD60AD964F7777426BC3C79B77382A>).

Attendance Policy

In general, regular and punctual attendance in all classes is expected of all students. However, at times, students will miss classes.

For 100-200 Level courses

Absences for **100-200 level courses** fall into two categories:

1. University Approved Absences

- a. University Approved Absences include Liberty University sponsored events, athletic competition, short-term (one week or less) or emergency military mobilizations, and other Provost-approved absences.
- b. The student must provide written documentation in advance for University Approved Absences. For military duty related absences, students who have received advanced notification orders are required to provide documentation for their military-related absence two weeks prior to the absence when feasible; however, students should turn-in documentation as soon as the orders are received. Whenever possible, students are required to be proactive by turning in pre-assigned coursework before their military related absence begins. In the event of a short notice military obligation (e.g. State Active Duty, emergency mobilization, rescheduled training assembly, etc.), students must notify faculty members as soon as possible.
- c. Work missed for University-approved absences may be made up.

2. Student Elective Absences

- a. Student Elective Absences include, but are not limited to, illness and bereavement.
- b. Work missed for Student Elective Absences may be made up at the discretion of the faculty member. Questions regarding missed work for Student Elective Absences must be addressed by the student with the professor within one week of returning to class. In cases where this is not possible, the student must notify the Professor in writing of the circumstances impacting his or her absence. The student may appeal the Professor's decision in writing to the respective Chair within one week. Final appeals may be made to the Dean in writing within one week of the Chair's decision and the Dean's decision is final.
- c. When circumstances result in excessive absences (e.g., serious medical illness, family crisis), upon return to campus, the student shall communicate in writing with the Registrar's Office (Registrar@liberty.edu) and provide an explanation of his or her situation with appropriate documentation. The Registrar will consult with the faculty member before making the final decision and will notify, in writing, the student and the faculty member.
- d. Students who are more than 10 minutes late for class are considered absent.

- e. Students who are late for class 10 minutes or less are considered tardy but present for the class. If a student misses in-class work due to tardiness, the faculty member may choose not to allow the student to make up this work. Three class tardies will be counted as one absence.
- f. Number of Student Elective Absences Permitted:
 - i. For classes that meet three times per week, the student will be permitted four elective absences for semester-long courses and up to two elective absences for 8-week courses.
 - ii. For classes that meet twice per week, the student will be permitted three elective absences for semester-long courses and one elective absence for 8-week courses.
 - iii. For classes that meet once per week, the student will be permitted one elective absence for semester-long and 8-week courses.
- 3. Penalties for each absence over the permitted number of elective absences per semester will be as follows:
 - a. 50 points for classes that meet 3 times per week
 - b. 75 points for classes that meet 2 times per week
 - c. 100 points for classes that meet once per week

For 300-400 Level courses

Absences for **300-400 level courses** fall into two categories:

- 1. University Approved Absences
 - a. University Approved Absences include Liberty University sponsored events, athletic competition, short-term (one week or less) or emergency military mobilizations, and other Provost-approved absences.
 - b. The student must provide written documentation in advance for University Approved Absences. For military duty related absences, students who have received advanced notification orders are required to provide documentation for their military-related absence two weeks prior to the absence when feasible; however, students should turn-in documentation as soon as the orders are received. Whenever possible, students are required to be proactive by turning in pre-assigned coursework before their military related absence begins. In the event of a short notice military obligation (e.g. State Active Duty, emergency mobilization, rescheduled training assembly, etc.), students must notify faculty members as soon as possible.
 - c. Work missed for University-approved absences may be made up.
- 2. Student Elective Absences
 - a. While the University believes that consistent attendance in all classes is the largest contributor to students earning good grades, the University Attendance Policy allows students in upper-level classes the opportunity to make their own decisions concerning attendance.
 - b. Work missed for Student Elective Absences may be made up at the discretion of the faculty member. Questions regarding missed work for Student Elective Absences must be addressed by the student with the professor within one week of returning to class. In cases where this is not possible, the student must notify the Professor in writing of the circumstances impacting his or her absence. The student may appeal the Professor's decision in writing to the

respective Chair within one week. Final appeals may be made to the Dean in writing within one week of the Chair's decision and the Dean's decision is final.

- c. When circumstances result in excessive absences (e.g., serious medical illness, family crisis), upon return to campus the student shall communicate in writing with the Registrar's Office (Registrar@liberty.edu) and provide an explanation of his or her situation with appropriate documentation. The Registrar will consult with the faculty member before making the final decision and will notify, in writing, the student and the faculty member.

Grading Scale

A	B	C	D	F
900-1000	800-899	700-799	600-699	0-599

For courses with a Pass/NP final grade, please refer to the Course Grading section of this syllabus for the assignment requirements and/or point value required to earn a Passing final grade.

Honor Code

Liberty University comprises a network of students, Alumni, faculty, staff and supporters that together form a Christian community based upon the truth of the Bible. This truth defines our foundational principles, from our Doctrinal Statement to the Code of Honor. These principles irrevocably align Liberty University's operational procedures with the long tradition of university culture, which remains distinctively Christian, designed to preserve and advance truth. Our desire is to create a safe, comfortable environment within our community of learning, and we extend our academic and spiritual resources to all of our students with the goal of fostering academic maturity, spiritual growth and character development.

Communities are predicated on shared values and goals. The Code of Honor, an expression of the values from which our Doctrinal Statement was born, defines the fundamental principles by which our community exists. At the core of this code lie two essential concepts: a belief in the significance of all individuals, and a reliance on the existence of objective truth.

While we acknowledge that some may disagree with various elements of the Code of Honor, we maintain the expectation that our students will commit to respect and uphold the Code while enrolled at Liberty University.

Adherence to the principles and concepts established within facilitates the success of our students and strengthens the Liberty community.

The Code of Honor can be viewed in its entirety at [Academic Honor \(https://libertyedu.public.na2.doctract.com/doctract/documentportal/08DC75DD5CA87692470E895D72AA1579\)](https://libertyedu.public.na2.doctract.com/doctract/documentportal/08DC75DD5CA87692470E895D72AA1579).

Add/Drop Policy

No course can be added after the first week of classes without signed approval from the course instructor and the Registrar's Office. A Fall/Spring course may be dropped up to and during Drop/Add Week.

Mathematical Late Assignment Policy

Mathematical assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions

1. Late *mathematical* assignments submitted within one week after the due date will receive a 10% deduction.
2. *Mathematical* assignments submitted more than one week late or after the final date of the course will not be accepted.
3. Discussion board assignments submitted within one week after the due date will receive a 10% deduction.
4. Discussion board submitted more than one week and less than 2 weeks late will receive a 20% deduction.
5. Discussion board submitted more than 2 weeks late will not be accepted.
6. Group projects, including group discussion board threads and/or replies, and assignments will not be accepted after the due date.

Special circumstances (e.g. death in the family, personal health issues) will be reviewed by the instructor on a case-by-case basis.

For other assignments, please refer to the standard Late Assignment Policy, below.

Late Assignment Policy

Course Assignments should be submitted on time.

If the student is unable to complete an assignment on time, then he or she must contact the instructor prior to the assignment due date.

Assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions:

1. Late assignments submitted within one week after the due date will receive a 10% deduction.
2. Assignments submitted more than one week and less than 2 weeks late will receive a 20% deduction.
3. Assignments submitted two weeks late or after the final date of the course will not be accepted.
4. Group projects/assignments will not be accepted after the due date.

Special circumstances (e.g. death in the family, personal health issues) will be reviewed by the instructor on a case-by-case basis.

Recording Policy

Class sessions may be audio/visually recorded for students in the class to refer back and for students who are unable to attend live, both currently and in the future. Students who participate are agreeing to have their voice and image recorded. If you are unwilling to consent to have your voice or image recorded, be sure to sit out of camera range and pass any questions to the instructor via a note written on paper (or via electronic communication like Microsoft Teams chat). Students are hereby notified that all course materials provided or otherwise made available to students during the course, including, but not limited to, lecture recordings, PowerPoints, documents, handouts, and other content available for on-demand streaming, are the exclusive property of the lecturer and/or Liberty University. Student access and use of such course materials is limited to the education/training of students enrolled in the respective course and section, and any other use, review, disclosure, dissemination, distribution, or copying of said materials or the contents is strictly prohibited.

Schedule

When	Topic	Notes
Module 1 Week 1	Functions, Order of Operations, and Payments	Text: 1.1 -1.2
	Apply	Course Requirement Checklist Assignments Module1: Week 1 HW and Quiz
Module 2 Week 2	Domain & Range, Graphs, and Ratios & Proportions	Text: 1.3 & 2.1
	Apply	Assignments Module 2: Week 2 HW and Quiz
Module 3 Week 3	Direct & Inverse Variation and Inflation	Text: 2.3 - 2.4
	Apply	Assignments Module 3: Week 3 HW and Quiz
Module 4 Week 4	Descriptive Stats, Histograms, Normal Curve, and Normal Probability	Text: 1.4 & 2.5

When	Topic	Notes
	Apply	Assignments Module 4: Week 4 HW and Quiz Project 1
Module 5 Week 5	Test 1	Text: 1.1 - 1.4 & 2.1 - 2.5
	Apply	Assignments Review for Test 1 Test 1
Module 6 Week 6	Unit Conversions and Scales	Text: 3.1 - 3.2
	Apply	Assignments Module 6: Week 6 HW and Quiz
Module 7 Week 7	Compound, Complex, and Metric Units	Text: 3.3 -3.4
	Apply	Assignments Module 7: Week 7 HW and Quiz
Module 8 Week 8	Percentages, Percent & Fractions, Percentage Costs, and Percent Change	Text: 4.1 - 4.3
	Apply	Assignments Module 8: Week 8 HW and Quiz Project 2
Module 9 Week 9	Tables, Standard Error, and Percentiles	Text: 3.5, 4.4 - 4.5
	Apply	Assignments Module 9: Week 9 HW and Quiz
Module 10 Week 10	Test 2	Text: 3.1 - 3.5 & 4.1 - 4.5

When	Topic	Notes
	Apply	Assignments: Review for Test 2 Test 2
Module 11 Week 11	Proportionality, Slopes, and Intercepts	Text: 5.1 - 5.2
	Apply	Assignments Module 11: Week 11 HW and Quiz
Module 12 Week 12	Linear Equations, Interpreting Equations, and Linear Regression	Text: 5.3 - 5.4
	Apply	Assignments Module 12: Week 12 HW and Quiz Project 3
Module 13 Week 13	Compound Interest, Exponential Growth, and Geometric Mean	Text: 6.1 - 6.3
	Apply	Assignments Module 13: Week 13 HW and Quiz
Module 14 Week 14	Test 3	Text: 5.1 - 5.4 and 6.1 - 6.3
	Apply	Assignments: Review for Test 3 Test 3
Module 15 Week 15	Review for Final Exam	Text: 1.1 - 1.4, 2.1 - 2.5, 3.1 - 3.4, 4.1 - 4.5, 5.1 - 5.4, and 6.1 - 6.3
	Apply	Assignments: Review for Final Exam

When	Topic	Notes
Module 16 Week 16	Final Exam	Text: 1.1 - 1.4, 2.1 - 2.5, 3.1 - 3.4, 4.1 - 4.5, 5.1 - 5.4, and 6.1 - 6.3
	Apply	Assignments: Final Exam