

## Quantitative Reasoning

### MATH-114

CG Section 8WK 11/08/2019 to 04/16/2020 Modified 04/06/2022

### Course Description

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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

For information regarding prerequisites for this course, please refer to the [Academic Course Catalog \(https://catalog.liberty.edu/\)](https://catalog.liberty.edu/).

### Rationale

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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

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

**MLO 1:** Utilize graphical displays to make accurate conclusions.

**MLO 2:** Formulate solutions to practical applications using ratios and proportions.

**MLO 3:** Apply fundamental mathematical concepts and formulas to financial questions regarding investments, comparative costs, and related applications.

**MLO 4:** Compute basic statistical quantities for correct analysis of data sets.

**MLO 5:** Construct spreadsheets that employ formulas to derive numerical results.

**MLO 6:** Analyze real-world situations involving mathematical data and make decisions accordingly.

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

### Course Resources

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Click on the following link to view the required resource(s) for the term in which you are registered: [Liberty University Online Bookstore \(https://bncvirtual.com/liberty\)](https://bncvirtual.com/liberty)

#### Additional Materials for Learning

- A. Computer with basic audio/video equipment
- B. Internet access (broadband recommended)
- C. Canvas [recommended browsers \(https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66\)](https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66)
- D. Microsoft Word
- E. Scientific calculator

## ☰ Course Assignments

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### Textbook readings and lecture presentations/notes

#### Course Requirements Checklist

After reading the Course Syllabus and [Student Expectations \(https://www.liberty.edu/institutional-effectiveness/student-expectations/\)](https://www.liberty.edu/institutional-effectiveness/student-expectations/), the student will complete the related checklist found in the Course Overview.

#### Discussions (2)

Discussions are collaborative learning experiences. Therefore, the student is required to provide a thread in response to the provided prompt for each discussion. Each thread must meet the word count stated in the discussion prompt and demonstrate course-related knowledge. In addition to the thread, the student is required to reply to 2 other classmates' threads. Each reply must be at least 50 words. (CLOs: CLO 3, 5, 6; FSLOs: TSQR 1, 3, 4).

#### Homework (HW) Assignments (8)

The student will complete a homework assignment in ALEKS for each module. Assignments will typically consist of several multiple-choice questions and questions that require numerical answers. Typically, assignments will cover 2–4 sections from the textbook, but this will vary depending on the length and difficulty of each section included in the assignment. (CLOs: CLO 1, 2, 3, 4, 6; FSLOs: TSQR 1, 2, 3).

#### Homework (HW): Exam Review Assignments (4)

Exam Review Assignments are a condensed combination of the two previous homework assignments whose content is included on the exam. Reviews cover no new material but provide another opportunity to recall topics and work through the types of problems that will be included in the exams. (CLOs: CLO 1, 2, 3, 4, 6; FSLOs: TSQR 1, 2, 3).

#### Project Assignments (2)

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. (CLOs: CLO 4, 5, 6; FSLOs: TSQR 1, 2).

#### Exam Assignments (4)

Each exam will cover the reading material for two modules: weeks: the material assigned during the exam module and the material from the previous module. Exams are not cumulative. Each exam will be open-book/open-notes, contain 20–30 questions, and have a 2-hour and 45-minute time limit. These exams will be completed in ALEKS that is associated with the course textbook. (CLOs: CLO 1, 2, 3, 4, 6; FSLOs: TSQR 1, 2, 3).

## ✓ Course Grading

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Discussions (2 at 40 pts ea)	80
Homework Assignments (8 at 40 pts ea)	320
Project Assignments (2 at 40 pts ea)	80
HW: Exam Review Assignments (4 at 10 pts ea)	40
Exam Assignments (4 at 120 pts ea)	480
<b>Total</b>	<b>1010</b>

## Policies

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### 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, including discussions, exams, and other graded 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 immediately by email.

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 up to a 10% deduction.
2. Assignments submitted more than one week and less than 2 weeks late will receive up to a 20% deduction.
3. Assignments submitted two weeks late or after the final date of the course will not be accepted outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.
4. Group projects, including group discussion threads and/or replies, and assignments will not be accepted after the due date outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.

### Disability Assistance

Students with a disability and those with medical conditions associated with pregnancy may contact Liberty University's Online Office of Disability Accommodation Support (ODAS) at [LUOODAS@liberty.edu](mailto:LUOODAS@liberty.edu) 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 <https://www.liberty.edu/online/online-disability-accommodation-support/> (<https://www.liberty.edu/online/online-disability-accommodation-support/>). Requests for accommodations not related to disabilities or pregnancy must be directed to the Registrar's Office, which generally handles medical needs support.

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](mailto:equityandcompliance@liberty.edu). Click to see a full copy of Liberty's [Discrimination, Harassment, and Sexual Misconduct Policy](https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf) ([https://www.liberty.edu/media/1226/Liberty\\_University\\_Discrimination\\_Harassment\\_and\\_Sexual\\_Misconduct\\_Policy.pdf](https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf)) or the [Student Disability Grievance Policy and Procedures](http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf) ([http://www.liberty.edu/media/8021/Disability\\_Grievance\\_Procedures.pdf](http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf)).

## Course Attendance

In an effort to comply with U.S. Department of Education policies, attendance is measured by physical class attendance or any submission of a required assignment within the enrollment dates of the course (such as examinations, written papers or projects, any discussion posts, etc.) or initiating any communication with one's professor regarding an academic subject. More information regarding the [attendance policy](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2BAnd%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=%2BNBTsPOoXuHAPLfISQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2BAnd%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=%2BNBTsPOoXuHAPLfISQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0>) can be found in the [Academic Course Catalogs](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBFnF%2B2ZJUC8eBd1OdNb26S9ADukODYsilXIA%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBFnF%2B2ZJUC8eBd1OdNb26S9ADukODYsilXIA%3D&reserved=0>). Regular attendance in online courses is expected throughout the length of the term. Students who do not attend within the first week of a sub-term by submitting a required academic assignment (such as the Course Requirements Checklist, an examination, written paper or project, discussion post, or other academic activity) will be dropped from the course. Students who wish to re-engage in the course are encouraged to contact Academic Advising to discuss their enrollment options. Students who begin an online course, but at some point in the semester cease attending, and do not provide official notification to withdraw, will be assigned a grade of "FN" ([Failure for Non-Attendance](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=MoMvZdPfa69InuhVHMHAVgu59ZP0Fw45xJTU9PIBrU%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=MoMvZdPfa69InuhVHMHAVgu59ZP0Fw45xJTU9PIBrU%3D&reserved=0>)). Students wishing to withdraw from courses after the official start date should familiarize themselves with the [withdrawal policy](#).

## Grading Scale

A	B	C	D	F
900-1010	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.

## Add/Drop Policy

The full policy statement and procedures are published in the [Policy Directory](https://wiki.os.liberty.edu/display/IE/Dropping+and+Adding+Online+Classes) (<https://wiki.os.liberty.edu/display/IE/Dropping+and+Adding+Online+Classes>).

## 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 <http://www.liberty.edu/index.cfm?PID=19155> (<http://www.liberty.edu/index.cfm?PID=19155>).

## Schedule

When	Topic	Notes
<b>Course Overview</b>	Student Acknowledgements	Course Requirements Checklist
	Technology Integration Set-Up	Prepare: Register for ALEKS
<b>Module 1: Week 1</b>	Learn	Read: 1 item Watch: 2 items
	Apply	HW: 2.1, 2.3 – 2.4, and 2.6 Assignment Discussion: Mortgages 15-year vs. 30-year
<b>Module 2: Week 2</b>	Learn	Read: 1 item Watch: 1 item
	Apply	HW: 2.2 and 2.7 Assignment HW: 2.1 -2.4, 2.6 – 2.7 Review for Exam Assignment Exam: 2.1 -2.4, 2.6 – 2.7 Assignment
<b>Module 3: Week 3</b>	Learn	Read: 1 item Watch: 1 item
	Apply	HW: 3.7, 4.1 – 4.4 Assignment Project: Standard Deviation, Range Rule of Thumb, and Percentage Error Assignment
<b>Module 4: Week 4</b>	Learn	Read: 1 item Watch: 1 item
	Apply	HW: 4.5 – 4.7 Assignment HW: 3.7, 4.1 – 4.7 Review for Exam Assignment Exam: 3.7, 4.1 – 4.7 Assignment
<b>Module 5: Week 5</b>	Learn	Read: 1 item Watch: 1 item Review: 1 item

When	Topic	Notes
	Apply	HW: 5.1 - 5.3 Assignment Discussion: Causes of Death in 1980 and 2016
<b>Module 6: Week 6</b>	Learn	Read: 1 item Watch: 1 item
	Apply	HW: 4.8 and 5.4 Assignment HW: 4.8 and 5.1 – 5.4 Review for Exam Assignment Exam: 4.8 and 5.1 – 5.4 Assignment
<b>Module 7: Week 7</b>	Learn	Read: 1 item Watch: 1 item
	Apply	HW: 8.1 – 8.2 Assignment Project: Energy Yearly Projections Using Electricity, Coal, and Oil Assignment
<b>Module 8: Week 8</b>	Learn	Read: 1 item Watch: 1 item
	Apply	HW: 8.3 – 8.4 and 1.2 Assignment HW: 8.1 – 8.4 and 1.2 Review for Exam Assignment Exam: 8.1 – 8.4 and 1.2 Assignment