



Math 110 - Course Syllabus

Course Title: *Critical Thinking, Finance, Logic, and Probability (3 Credits)*

Course Description: Though mathematics may appear unrelated to biblical studies or Christian ministry, it is fundamentally applied logic, a form of applied theology. Recognizing this connection highlights the importance of logical thinking and practical math skills in exploring biblical texts and conducting Christian ministry. This course will encompass the following four main topics, each explored through a biblical lens using practical, real-world examples:

- Critical Thinking: Including logical argumentation, fallacies, and biblical analysis.
- Finance: Focusing on biblical financial principles and practical money matters including budgeting, saving, spending, taxes, investment strategies, debt management, and charitable giving.
- Logic: Covering logical analysis history, techniques, and notation.
- Probability: Delving into practical and Bayesian probability.

Students are expected to complete weekly assignments and undertake special projects such as the logical examination of Scripture and the creation of a personal budget. Further evaluation will be gained from weekly quizzes and a midterm and final exam.

Prerequisites: None

Instructors:

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Course Materials:

- Bible (unless otherwise specified, you may use the translation of your choice)
 - Lecture notes and quiz blanks will use the ESV translation.
- Lecture slides and optional additional resources will serve as the main teaching materials for this course.

Class Time: Class will meet once weekly on Fridays from 4pm-7pm from 01/12/2024 – 04/26/2024, with a break on 02/16/24. Class will take place in Room 105 at Hope Community Church, located at 2100 Ellsworth Rd. Ypsilanti, MI, 48197. Class time will be broken down into the following general schedule:

- Quiz (4:00 - 4:10)
- Review of Assignments (4:10 - 4:15)
- Lecture (4:15 - 5:20)
- Break (5:20 - 5:30)
- Lecture (5:30 - 6:30)
- Discussion (6:30 - 7:00)

Assignments:

- **Quizzes** - There will be 12 quizzes over the course of the semester. These quizzes will generally take place at the beginning of class time each week and will cover the previous week's study materials. The quiz format will include multiple-choice, fill-in-the-blank, and short-answer-style questions. The purpose of these quizzes is to provide the students with regular graded feedback on their understanding of the course material and to prepare them for the exams. The quizzes also ensure a student's regular and on-time attendance for the scheduled lecture time. The lowest 2 quiz scores for each student will be dropped.
- **Homework** - There will be 13 homework assignments throughout this course. Each homework assignment is distinct with the exact details published on Canvas. The homework assignments are designed to help reinforce the study material and provide a graded structure for study and personal reflection on the material in this course. Homework for each week will be due just before class on Fridays. The lowest homework score will be dropped.
- **Midterm Exam** - The midterm exam will take place on 03/8/24 during the first part of class time. The exam will cover all lecture and study material content up to that point. The purpose of the exam is to encourage each student to review the material studied so far and to ensure that each student retains the information learned throughout the course of the semester. The exam will be structured in the same format as the quizzes.
- **Final Exam** - The final exam will take place on 04/26/24. The exam will be based on material covered strictly in the second half of the course (since the midterm). The purpose of the exam is to encourage each student to review the entire course material and to ensure that each student retains the information learned throughout the course of the semester. The exam will be structured in the same format as the midterm and the quizzes.

Canvas: Canvas is an online course management system for college courses. It will be used in this course for online submission of assignments and for posting grades, announcements, and access to relevant course documents. Further details on how to set up a Canvas account and access this course can be found in the appendix to this document.

Assessment: Assignments will have the following grade weights:

Assignment	Grade Weight	Notes
Quizzes	25%	12 quizzes according to the course schedule. Lowest two quizzes dropped.
Homework	25%	13 homework assignments all equally weighted. Lowest score will be dropped.
Midterm Exam	25%	On 03/8/24.
Final Exam	25%	On 04/26/24.

We will use the following thresholds to convert raw scores in the course into letter grades:

- A+: $\geq 98\%$
- A: $\geq 92\%$
- A-: $\geq 90\%$
- B+: $\geq 88\%$
- B: $\geq 82\%$
- B-: $\geq 80\%$
- C+: $\geq 78\%$
- C: $\geq 72\%$
- C-: $\geq 70\%$
- D+: $\geq 68\%$
- D: $\geq 62\%$
- D-: $\geq 60\%$
- F: $< 60\%$

Depending on the distribution of raw scores at the end of the semester, these thresholds may change; however the final thresholds will be no stricter than the current thresholds. For example, if you receive a raw score of 85% in the course, you will be guaranteed a letter grade of at least B; however, it may happen that you receive a higher letter grade depending on the overall distribution of raw scores.

Class Schedule:

Week #	Lecture Topics	Assignments Due (Day of Lecture)
Week 1 (1/12/24)	<ul style="list-style-type: none"> ● Course Introduction, Syllabus, etc. ● Introduction to Critical Thinking 	
Week 2 (1/19/24)	<ul style="list-style-type: none"> ● Introduction to Argumentation ● Understanding Logical Fallacies 	<ul style="list-style-type: none"> ★ Homework 1 (Critical Thinking Scenarios) ★ Quiz 1 (Week 1 Lecture)

Week 3 (1/26/24)	<ul style="list-style-type: none"> ● Biblical Analysis & Critical Thinking ● Critical Thinking in Everyday Life 	<ul style="list-style-type: none"> ★ Homework 2 (Argumentation & Logical Fallacies) ★ Quiz 2 (Week 2 Lecture)
Week 4 (2/2/24)	<ul style="list-style-type: none"> ● Biblical Perspective on Wealth ● History of Money & Investments 	<ul style="list-style-type: none"> ★ Homework 3 (Biblical Analysis & Critical Thinking) ★ Quiz 3 (Week 3 Lecture)
Week 5 (2/9/24)	<ul style="list-style-type: none"> ● What the Bible Says About Debt ● Practical Finances Part 1: Bills & Budgeting 	<ul style="list-style-type: none"> ★ Homework 4 (Biblical Wealth Investigation) ★ Quiz 4 (Week 4 Lecture)
Week 6 (2/16/24)	Fur Rendezvous Break!	
Week 7 (2/23/24)	<ul style="list-style-type: none"> ● Practical Finances Part 2: Banking, Credit, & Mortgages ● Investments Part 1: Understanding the Stock Market 	<ul style="list-style-type: none"> ★ Homework 5 (Future Personal Budget Planning) ★ Quiz 5 (Week 5 Lecture)
Week 8 (3/1/24)	<ul style="list-style-type: none"> ● Investments Part 2: Bonds, Real Estate, Crypto, etc. ● Planning for the Future: Insurance & Retirement 	<ul style="list-style-type: none"> ★ Homework 6 (Stock Investment Portfolio) ★ Quiz 6 (Week 7 Lecture)
Week 9 (3/8/24)	<ul style="list-style-type: none"> ● Christian Finances & Generosity ☆ Midterm Exam! 	<ul style="list-style-type: none"> ★ Homework 7 (Midterm Exam Review Questions) ☆ Midterm Exam
Week 10 (3/15/24)	<ul style="list-style-type: none"> ● History of Logic and Christian Thinkers ● Truth Tables & Propositional Logic 	<ul style="list-style-type: none"> ★ Quiz 7 (Week 8 & 9 Lectures)
Week 11 (3/22/24)	<ul style="list-style-type: none"> ● Rules of Inference & Logical Derivation ● Quantifiers in Logic: Universal & Existential 	<ul style="list-style-type: none"> ★ Homework 8 (Truth Tables & Propositional Logic) ★ Quiz 8 (Week 10 Lecture)
Week 12 (3/29/24)	<ul style="list-style-type: none"> ● Venn Diagrams & Set Theory ● Logic & the Nature of God 	<ul style="list-style-type: none"> ★ Homework 9 (Rules of Inference & Quantifiers) ★ Quiz 9 (Week 11 Lecture)
Week 13 (4/5/24)	<ul style="list-style-type: none"> ● Why Probability? An Introduction To Probabilistic Reasoning ● Rules of Probability & Independent Events 	<ul style="list-style-type: none"> ★ Homework 10 (Venn Diagrams & Set Theory) ★ Quiz 10 (Week 12 Lecture)
Week 14 (4/12/24)	<ul style="list-style-type: none"> ● Conditional Probability & Bayes' Rule ● Applying Probabilistic Reasoning: Medical Diagnostics and Naive Bayes' 	<ul style="list-style-type: none"> ★ Homework 11 (Rules of Probability & Independent Events) ★ Quiz 11 (Week 13 Lecture)
Week 15 (4/19/24)	<ul style="list-style-type: none"> ● Displaying and Summarizing Data ● Expected Value & Error Analysis 	<ul style="list-style-type: none"> ★ Homework 12 (Conditional Probability & Bayes' Rule) ★ Quiz 12 (Week 14 Lecture)

Week 16 (4/26/24)	<ul style="list-style-type: none"> ☆ Final Exam! ● Final Discussion 	<ul style="list-style-type: none"> ★ Homework 13 (Final Exam Review Questions) ☆ Final Exam
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Late Policy:

Assignments are expected to be submitted prior to the due date. If there are extraordinary circumstances outside of the student's control, they may request an extension from the teaching staff.

Additionally, it is often the case that due to any number of other circumstances, a student finds that they are unable to adequately complete a given assignment. In such cases, the student is welcome to submit the assignment after the due date, up to the end of the semester; however, a late penalty will be given for such a late assignment. The standard late penalty is a 20% flat reduction in grade for the given assignment. This late penalty is meant to penalize late submissions and encourage timeliness, while still allowing the student to still finish the given assignment to the best of their ability even if they are unable to complete the assignment for some time due to any extended circumstances.

This late policy is subject to instructor discretion. The 20% late penalty policy is intended to allow for unique or difficult but not extraordinary circumstances. Any student who abuses this policy, per the instructor's discretion, is liable to have this policy revoked and the grade revert to either a zero or that based on any submission prior to the due date.

Appendix: How to Set up Your Canvas Account

This course will use the free version of Canvas. This means that you will be able to set up a Canvas account with your regular email and will be able to access the course on Canvas with a simple course invitation sent to your email. Please perform the following steps to set up your Canvas account:

- Check your email for a course invitation to Canvas.
- Click the “Get Started” button, which should redirect you to a Canvas page.
- Accept the course invitation. Upon accepting, it should redirect you to a page that will allow you to either set up a new Canvas account or link a current Canvas account.
- If you do not already have a free Canvas account, proceed to create a new account. To create a new account, it will set your login to be your email, you simply need to set your password and accurate time zone.

Your new account should be all set. To log in to Canvas in the future, go to the following URL: <https://canvas.instructure.com/login/canvas>

Use your email and password to log in. Then click on your course.

To use the mobile Canvas app, you’ll want to download the Canvas app. Upon downloading and opening the app for the first time, it will prompt you to “Find my School.” Select this option and put in “Free Canvas Accounts.” Select this option and proceed to log in with your email and password associated with your free Canvas account.

Appendix: How to submit assignments on Canvas

From the course’s Canvas home page, navigate to the assignments tab. Select the specific assignment from the list of assignments. Follow the instructions for the different cases of typed and handwritten submissions.

For typed documents:

- Click “Start Assignment” (“Submit Assignment” in the mobile app)
- Click “Upload File” (“Files” in the mobile app)
- Click “Choose File” (simply select the file in the mobile app)
- Navigate to the proper file and select it
- You may add any number of files by selecting “Add Another File”

For handwritten documents:

You may use a scanner, scanner app, or simply take photos of your work and submit the files by following the same steps outlined for typed documents. The best option may be to use the Canvas mobile app to submit the assignment and use the scanner feature as an option after selecting “Submit Assignment.”

Please note, you may submit as many times as you would like prior to the assignment deadline. The most recent submission will count as your graded submission.

Appendix: Academic Integrity

Students are expected to hold themselves to a Christian standard of ethics in all matters. This includes but is not limited to, refraining from any forms of plagiarism, cheating, sharing, or acquiring any materials that would give a student an unfair advantage, or any dishonest representation of one's work. Below are outlined the consequences for an infringement of academic integrity for a given assignment:

- First offense – A grade of zero is given for the assignment; the professor must notify the Registrar and Dean of Students. A statement goes into the student's file.
- Second offense – A grade of F is assigned for the course; the professor must notify the Registrar and Dean of Students. A statement goes into the student's file. The Dean of Students and/or Registrar will notify faculty of students who incur a second offense in this area.
- Third offense – The professor must notify the Registrar and Dean of Students. A statement goes into the student's file and the student may be suspended or dismissed from this institution.

Appendix: Policy on Use of Generative Language Models For Written Assignments

The use of generative language models, such as ChatGPT, is not strictly prohibited and in some cases is very much encouraged as a research and brainstorming tool. However, all written assignments submitted as your own work should reflect your own personal writing. This prohibits copy and paste use of such tools, however, you may feel free to quote such tools provided that you make clear it is a quotation.

In general, you should treat generative language models as equivalent to speaking to another person. You may gain insight from them and be able to improve your value and productivity, but you should not misrepresent someone else's work as your own. These tools may also be treated somewhat like calculators in a math class. You may use them when appropriate and assignments may even assume their use in some ways, but all submitted work must be your own unless specified otherwise.