| **Georgetown University, BLS** **BLHV 1006: Math as Philosophy****Spring 2024** |
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**Credits:** 3

**Dates:** January 10 - May 10, 2024

**Location**: Georgetown University School of Continuing Studies (SCS) utilizes the Coursera platform for this course. As an online course, all course content will be provided and exchanged on the Coursera platform.

**Instructor:** Professor JT Paasch

**Contact Information:** bls-support@georgetown.edu

*Note: This mailbox is monitored on a frequent and ongoing basis. Please use this email address for all technology and course-related questions, and your inquiry will be directed to the appropriate person.*

**Office Hours:** Office hours are by request.

| **Course Description**   |
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Here is a stunning fact: the world can be understood mathematically. This fact underlies our success in science, computers, and even our private everyday reasoning processes. But why is this so? Why is mathematical thinking so astonishingly useful? In this course, we examine the conceptual foundations of mathematics. **No prior mathematical knowledge is required**. This is not a course about doing calculations. It is about abstract structures, and how we use structure in our thinking. Throughout the course, we will ask the following questions. How do we organize things into collections, and networks? Does “+” (adding) mean what you think it means? Are there numbers that can’t be enumerated (even by God), and if so, how do we even know about such spooky numbers? How do computers work, and how could it possibly all boil down to just ones and zeros? Are there math problems that can't be solved (even with an infinitely powerful computer)? And how do we even know how to figure out the answer to that? Finally, how do computer simulated neural networks “learn,” and how much is it like human learning?

| **Course Learning Objectives**  |
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By the end of the course, you will be able to:

1. Explain deductive reasoning and the mathematical method.
2. Apply deductive reasoning to a variety of situations, including philosophy, law, politics, and regular day-to-day reasoning.
3. Explain some of the fundamental concepts of modern mathematics in writing in clear and ethical way through appropriate forms and media
4. Use fundamental concepts in mathematics in order to critically and ethically assess various scenarios in our modern world that involve math (e.g., artificial intelligence, cryptocurrency, computability, etc.).

| **Required Materials for Purchase** |
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You are not required to purchase any textbooks for this course. All the reading materials are in the course and provided to you.

| **Overview of Course Structure** |
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This course consists of 13 modules plus the orientation module which are taken over a 13-week term. Each module length is either one week or multiple weeks as designated in this syllabus.

| **Assignments** |
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Your course grade will be based on your completion of the following activities and assignments. You will read full details about each of them in the Coursera course. Each assignment category will be weighted according to the percentages below.

| **Participation**The participation percentage is calculated based on your engagement on discussion boards and your timely submission of your posts.Ponder Discussion Questions - 7.5 %Muddy Points Discussion Questions - 7.5% | **15%** |
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| **Notes Peer Review Assignment**This assignment consists of two parts: **Part 1:** In weeks 4, 7 and 10 you will be asked to create and submit notes that cover the material discussed in previous weeks. Your notes should include all the materials covered in previous weeks, include examples created by you (do not use examples from the text) to explain ideas and definitions, and it should be uploaded as a PDF.**Part 2:** Each student is assigned a peer-reviewer to review their notes. Peer-reviewers use a grading rubric to grade the assigned peer’s work. They share insights about what they notice, things they like about the notes, and where they see room for improvement at the end of the grading rubric in a text form.  | **40%** |
| **Quizzes**Every week (except for 1 and 12) you will take a quiz. There is no time limit, and you can try as many times as you like to finish these questions. It is open book, open note, open friend, and open Professor's office hours. These questions are here to help guide your study. | **30%** |
| **Final Exam**You will take your final exam in the final week of the course. The exam will be available from April 24 to April 28, 2024.  | **15%** |
| **TOTAL** | **100%** |

#### **Submission Policy**

Submit all assignments to the Coursera course site. **Assignments submitted through email are not acceptable** and will be considered missing/and or late. Please also retain a personal copy of all assignments submitted until the end of this course is complete and you’ve received your final grade.

#### **Late Work Policy**

Students are expected to submit their assignments by the time on the date indicated on Coursera and the syllabus. Please contact the instructor at least 3 business days in advance if you know that you are going to be late or miss an assignment due date. The instructor will review late submission requests and circumstances on a case-by-case basis and will make a determination if an extension is warranted. Prior notice will provide time for discussing and identifying an alternative due date (if the extension is warranted). If the extension is granted, the instructor can deduct up to 10% of the grade of the assignments submitted late and limit the extension to a maximum of 7 days. After a seven-day extension, the assignment will receive a zero.

#### **Instructor Feedback/Turnaround**

If you have a concern and send me a message, you can expect a response to your email within 3 business days. Please allow 4-7 business days for assessment submission feedback.

| **Grading** |
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Each type of assignment has a detailed grading rubric that you will reference as you complete your assignments. I will grade all of your work using these rubrics.

A: 93% to 100%

A-: 90% to 92%

B+: 87% to 89%

B: 83% to 86%

B-: 80% to 82%

C+: 77% to 79%

C: 73% to 76%

C-: 70% to 72%

D+: 67% to 69%

D: 63% to 66%

F: 62% and below

| **Time Commitment** |
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Online courses meet the same academic standards as on-campus courses. Each week is equal to the same level of participation, commitment, and academic rigor as a face-to-face class. For a 15-week, 3-credit course, you should allocate *6-10 hours per week*. For a 13-week, 3-credit course, you should allocate *8-12 hours per week*.

| Weekly Schedule  |
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There are four different types of graded assignments you need to complete and submit during a week as well as a final exam in the last week of your course. These are the deadlines for the assignments and the weeks they need to be completed.

**Ponder Discussions** - Initial post completed by Monday of the week 11:59 PM Eastern Standard Time. Response to peers completed by Thursday of the week 11:59 PM Eastern Standard Time.

**Muddy Points Discussions** - Initial post completed by Wednesday of the week 11:59 PM Eastern Standard Time.

**Notes Peer-Review Assignments** - Submit your notes by Sunday 11:59 PM in Weeks 4, 7, and 10. Review your peer’s work by Saturday 11:59 PM Eastern Standard Time in Weeks 5, 8, and 11..

**Quizzes** - Complete your quiz by Sunday 11:59 PM Eastern Standard Time.

**Final Exam -** Your final exam will be available for six days (see schedule below). You will be able to take it any time during this period.

| Date | Module | Assignments Due |
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| 01/10-01/14 | **Orientation** | 1. **Review** syllabus
2. **Discussion Post** - Introduce Yourself
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| **Module 1**01/15-01/21 | **Mathematical Methods I** | 1. **Ponder Discussion Post** - Initial post by Monday
2. **Muddy Points** - Initial post by Wednesday.
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| **Module 2**01/22-01/28 | **Mathematical Methods II** | 1. **Practice Peer-Review (Ungraded)** - Submit your assignment by Thursday and review your peer’s work by Sunday.
2. **Muddy Points** - Initial post by Wednesday.
3. **Quiz** - Complete the quiz by Sunday.
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| **Module 3**01/29-02/04 | **Sets**  | 1. **Ponder Discussion Post** - Initial post by Monday
2. **Muddy Points** - Initial post by Wednesday.
3. **Quiz** - Complete the quiz by Sunday.
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| **Module 4**02/05-02/11 | **Functions** | 1. **Ponder Discussion Post** - Initial post by Monday
2. **Notes Peer-Review (Graded)** - Submit your notes by Sunday and review your peer’s notes by Week 5 Saturday.
3. **Muddy Points** - Initial post by Wednesday.
4. **Quiz** - Complete the quiz by Sunday.
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| **Module 5**02/12-02/18 | **Relations and Structures** | 1. **Notes Peer-Review (Graded)** - Review the notes of your peer for Weeks 1, 3, and 4 by Saturday.
2. **Muddy Points** - Initial post by Wednesday.
3. **Quiz** - Complete the quiz by Sunday.
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| **Module 6**02/19-02/25 | **Graphs** | 1. **Ponder Discussion Post** - Initial post by Monday
2. **Muddy Points** - Initial post by Wednesday.
3. **Quiz** - Complete the quiz by Sunday.
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| **Module 7**02/26-03/10 | **Numbers** | 1. **Ponder Discussion Post** - Initial post by Monday
2. **Notes Peer-Review (Graded)** - Submit your notes by Sunday and review your peer’s notes by Week 8 Saturday.
3. **Muddy Points** - Initial post by Wednesday.
4. **Quiz** - Complete the quiz by Sunday.
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| **Spring Break**03/02-03/10 |
| **Module 8**03/11-03/17 | **Infinities** | 1. **Notes Peer-Review (Graded)** - Review the notes of your peer for Weeks 5, 6, and 7 by Saturday.
2. **Muddy Points** - Initial post by Wednesday.
3. **Quiz** - Complete the quiz by Sunday.
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| **Module 9**03/18-03/24 | **Algebras I** | 1. **Muddy Points** - Initial post by Wednesday.
2. **Quiz** - Complete the quiz by Sunday.
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| **Module 10**03/25-04/07 | **Algebras II** | 1. **Notes Peer-Review (Graded)** - Submit your notes for weeks 8, 9, and 10 by Sunday.
2. **Muddy Points** - Initial post by Wednesday.
3. **Quiz** - Complete the quiz by Sunday.
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| **Easter Break** March 28-April 1 |
| **Module 11**04/08-04/14 | **Computers** | 1. **Ponder Discussion Post** - Initial post by Monday
2. **Notes Peer-Review (Graded)** - Review your peer’s notes for weeks 8, 9, and 10 by Saturday.
3. **Muddy Points** - Initial post by Wednesday.
4. **Quiz** - Complete the quiz by Sunday.
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| **Module 12**04/15-04/21 | **Cryptocurrency** | 1. **Ponder Discussion Post** - Initial post by Monday
2. **Muddy Points** - Initial post by Wednesday.

 No Quiz |
| **Module 13** 04/22-May 10 | **Artificial Intelligence** | 1. **Ponder Discussion Post** - Initial post by Monday
2. **Final Exam** - Open May 3-8. Due by May 8.
3. **Muddy Points** - by May 10.
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| **Course Policies** |
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The course will follow SCS Course Policies in the following areas:

Attendance Policy

Citation Policy

Communication Policies

The Honor Pledge

Netiquette And Classroom Guidelines

Incomplete and Withdrawal Policies

Accommodation Policy

Technical Requirements

Student Support and Help

You can review these policies and other student resources in the Orientation Course.