# Logic: Course Syllabus (Summer 2021)

|  |  |  |  |
| --- | --- | --- | --- |
| **Instructor** | Brendan Shea, PhD (call me “Brendan”.) | **Course number** | PHIL 1145-71 |
| **Contact Info (email preferred)** | [Brendan.Shea@rctc.edu](mailto:Brendan.Shea@rctc.edu)  (507) 722-1146 | **Prerequisites** | None |
| **Class Time** | Online | **Class location** | Online |
| **Office Hours** | Mon and Wed 12 to 1 via Zoom. Link will be available on D2L. | **Office location** | M2403Q |

**Course Description.** This course is an introduction to the systematic study of reasoning and argumentation. Students will learn how informal and formal logic can be used to evaluate the strength or validity of arguments, especially ones drawn from ordinary language. They will also develop the capacities to recognize common fallacies, and to apply the methods of logic to problems of contemporary interest. While this course challenges students with abstract reasoning, the study of logic will demystify the underlying structure of language, highlight abuses of reason, teach the values of critical reading, and suggest strategies for formulating coherent, well-reasoned writing. (Prerequisites: None). (3 credits, 3 hrs/week)

## Course Content and Learning Outcomes

**Outline of Major Content Areas.**

1. Informal Logic
   1. Recognizing argument structure
   2. Deductive and inductive arguments
   3. Argument evaluation
   4. Common fallacies
2. Categorical Logic
   1. Properties of categorical propositions
   2. Immediate inferences
3. Propositional Logic
   1. Logical operators
   2. Translations
   3. Truth tables
   4. Proof methods in propositional logic
4. Predicate Logic
   1. Translations
   2. Other material as appropriate
5. One or more of the following topics:
   1. Argument diagrams
   2. Categorical syllogisms
   3. Proof methods in predicate logic
   4. Inductive logic
   5. Scientific reasoning
   6. Causal reasoning
   7. Moral and legal arguments
   8. History and philosophy of logic

**Learning Outcomes (General):** The student will be able to:

1. Identify and categorize arguments using the concepts of inductive and deductive logic.
2. Formulate arguments using clear, unambiguous language
3. Discriminate between fallacious and non-fallacious reasoning
4. Explain the relevance of formal methods to real-world problems
5. Represent ordinary language arguments in symbolic form.
6. Appraise the soundness or cogency of arguments.

**Learning Outcomes (Minnesota Transfer Curriculum):**

*Goal 4/Mathematics/Logical Reasoning*: The student will be able to:

1. Illustrate historical and contemporary applications of mathematics/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument (proof).

**RCTC Core Outcomes.** This course contributes to meeting the following RCTC Core Learning Outcome(s):

**Communication.** Students will communicate appropriately for their respective audiences. (1) Select and/or apply appropriate technology based on audience or situation. (2) Make meaningful connections and relationships with their audience. (3) Recognize communication is situational. (4) Articulate or identify a clear and logical main idea.

**Critical Thinking.** Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion. (1) Gather relevant information, (2) Synthesize, analyze, and evaluate information, (3) Make logical connections, (4) Support positions or conclusions, (5) Use information to create innovative solutions.

Descriptions of the Outcomes can be found here: <https://www.rctc.edu/wp-content/uploads/2020/12/RCTC-Core-Learning-Outcomes_December2020.pdf>

## Required Course Materials

All required course materials will be available online.

## Grading

**Grading Scale:** The grading scale is: >90 (A), 80-89.9 (B), 70 -79.9 (C), 60-69.9 (D), <60 (F).

Your final grade is a weighted average of the following:

1. **Five D2L Problem Sets (50%).** Each problem set will consist of both “objective” (auto-graded by D2L) and short answer/written questions (graded by me). For the objective portion of the problem sets, you’ll have 3 chances to submit to improve your score, and only your best score will count. For the summer session, these will generally be due on MONDAYS. You’ll generally have a week to work on each problem set.
2. **Midterm (20%) and Final (30%) Exam.** There will be two D2L-brightspace exams over the course of the semester, with a mix of objective and short answer questions (similar to the problem sets, but longer and more involved). Unlike the problem sets, you will have only ONE chance to submit the exam. You MUST submit both exams to continue in the class.
   1. You’ll have a week to complete each exam. Please don’t leave it until the last second!
   2. Exam 2 is “comprehensive” is the sense that some questions will relate to material already covered on exam 1 (after all, you don’t want to forget what you’ve learned!).
   3. You are allowed to work with ONE partner. However, my expectation is that (1) before meeting with your partner, you will have spent at least two hours working on the exam individually, and will have made an attempt to answer each question (2) you and your partner meet for at least an hour (if you can’t meet face-to-face, it’s fine to meet virtually) and (3) the work you submit should be your own. (For example, you should write your OWN answers to the short answer questions).
   4. You will receive a question-by-question score on the exam. However, the answer keys to the exams will NOT be released on D2L. I am always happy to talk about your exam in person or over the phone/Zoom/etc., however.
   5. I will curve each exam score to ensure a median score of at least 80%. (In general, the curve tends to be much more significant for exam 2 than for exam 1).
3. **Extra Credit (up to 5%).** Face-to-face students will earn 5% extra credit for attending at least 90% of classes, or 3% extra credit for attending at least 80% of classes. Online students can earn this through weekly “check-in” emails (see below).

**Plagiarism and Academic Integrity.** Your work should be your own—please don’t use your classmates, friends, parents, or the internet to “help” you with your work in cases where this is not allowed. A first violation will lead to a failing grade for the assignment, a second violation will lead to failing grade for the course. The school may also apply additional penalties (see RCTC Academic Integrity Statement below).

**Attendance.** I will occasionally take attendance in face-to-face classes, and I expect on-campus students to attend class regularly (and on time), and online students to participate via D2L and MindTap. If you miss one week of class (and/or homework assignments) consecutively, or miss more than 1/3 of the total classes, you risk being withdrawn from the class (and receiving a failing grade of FW). I will make exceptions if special circumstances arise, but you need to let me know about these in a timely manner.

### Late WorK

The late work policies are as follows:

1. Problem sets (and the midterm exam) can be submitted up 1 day late will be penalized 10%, and those submitted up to 3 days late will be penalized 20%. Problem sets submitted after this will not receive credit, absent special circumstances (see below).
2. The final exam CANNOT be submitted late, absent special circumstances.
3. I understand emergencies—hospital trips, military deployments, etc.—occur. If this happens, let me know, and we can work something out.

All late work must be completed by the end of class.

### RCTC Common Policies

This course will be taught in accordance with the following policies, which apply to ALL RCTC courses. If you have any questions about these, please let me know!

**Academic Integrity.** The primary academic mission of Rochester Community and Technical College (RCTC) is the exploration and dissemination of knowledge, and academic honesty and integrity are integral to the academic process. Academic dishonesty - cheating, plagiarism, and collusion - is a serious offense which undermines the educational process and the learning experience for the entire college community. RCTC students are expected to understand and adhere to the concept of academic integrity and to the standards of conduct prescribed by the College’s [Academic Integrity Policy](https://www.rctc.edu/policies/education/academic-integrity/). Any act of academic dishonesty attempted by a student at Rochester Community and Technical College is unacceptable and will not be tolerated.

**Americans with Disability Act.** Rochester Community and Technical College is committed to ensuring its programs, services and activities are accessible to individuals with disabilities, through its compliance with state and federal laws, and [System Policy](http://www.minnstate.edu/board/policy/1b04.html). Appropriate accommodations are provided to those qualified students with disabilities. If you believe you qualify for an academic accommodation, please contact the Director of Disability Support Services, Travis Kromminga at 507-280-2968 or through the Minnesota relay TTY 1-800-627-3529. The office can also be reached via e-mail at [DisabilityServices@rctc.edu](mailto:DisabilityServices@rctc.edu)

**Military Friendly Statement.** Rochester Community and Technical College (RCTC) is a military friendly campus, pledging to do all we can to help military veterans transition into college to complete their educational goals. RCTC is proud to be a Beyond the Yellow Ribbon campus, serving and honoring our veterans, military service members and their families. Through the Veterans Resource Center, RCTC offers student veterans an on‐campus point of contact with other veterans, and program information to assist them in making a successful transition into college. For assistance, students are encouraged to contact the Veterans Assistant Coordinator, Mark Larsen, at 507‐779-9375 or e‐mail at [mark.larsen@state.mn.us](mailto:mark.larsen@state.mn.us), or Glen Saponari, RCTC’s VA certifying official at 507-280- 5511 or email at [VeteranServices@rctc.edu](mailto:VeteranServices@rctc.edu).

**Title IX Statement.** Sexual violence and other forms of sexual misconduct is prohibited at Minnesota State colleges and universities (Minnesota State). Any individual who has been, or is being, subjected to conduct prohibited by the Sexual Violence Policy is encouraged to report the incident. Individuals may choose to file a complaint anonymously using the online reporting tool (<https://www.rctc.edu/services/student-affairs/sexual-violence/>). Individuals who choose to file anonymous reports are advised that it may be difficult for the college to follow up or take specific action, where information is limited. For additional information please see the RCTC Sexual Violence Policy, <http://www.rctc.edu/policies/system/sexual-violence> or contact Rebecca Peine, Title IX Coordinator, at 507-285-7195 or email at [TitleIX@rctc.edu](mailto:TitleIX@rctc.edu).

## Getting in touch with me (and what to include in an Email)

The best way to get ahold of me is by e-mail, which I will aim to respond to within ONE working day (for simple questions) or TWO working days (for more complex ones). I don’t generally respond to email on the weekends or holidays. If you don’t hear from me by then, please try emailing me again. In order to help me provide you with quick, effective feedback, here’s a general template for what I expect in an email.

*Dear Brendan (or Professor Shea):*

*My name is [full name], and I’m a student in [this section] of [this class]. I had a question regarding [identify homework problem, textbook chapter, etc. Be specific, and include a copy of anything I might need to answer your question, including the full problem text]. Here’s everything I’ve tried so far to figure out the answer for myself [looked at the syllabus, notes, textbook, etc.], and here’s my best guess as to the answer. Could you help me by doing the following? [Be specific in what you are asking me to do.] [Feel free to include anything else you’d like here. I’m always happy when students send along ideas/links/whatever vaguely relating to logic and philosophy 😊]/*

As a rule, I will not respond to emails asking me to exempt you from class policies without very good reason (e.g., for late-work extensions outside the conditions outlined above), or to emails that lack basic information (your full name, class, etc.). For long or complex questions, I highly encourage you to schedule an appointment so that we can talk (either in person, by phone, or via Zoom).

## Online (Asynchronous) Students Students: Weekly check-in emails

*This is an optional,* ***extra-credit*** *part of the class grade.*

I realize that it can be difficult to connect with professors in online classes. With that in mind, I’d like to encourage you to send me a weekly check in email telling me how you are doing in the course, asking any questions you have, etc. These should be sent by the **end-of-the-day Monday,** starting in Week 2. Since these count toward your grade, here’s what you need to include to get credit:

1. Follow basic email conventions (see above).
2. Give a description of how your work has been going in the class. Tell me about (a) how long the homework took, (b) which problems/ideas were hardest/easiest, and (c) anything else you think is relevant.
3. Identify ONE idea/concept we’ve covered over the week that you found interesting. Explain the idea in your own words, and say a bit about why you found it interesting.
4. Ask me any questions you have!
5. Aim to write 200 to 250 words. Emails shorter than this risk not receiving credit.

You’ll get +1% extra credit (to a max of 5%) for each weekly email you send (you can only get credit for one per week).

## Course Calendar

The following calendar indicates the due dates and course structure. Review the late work policy for information on late penalties.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Week | Starting (Sun) | Monday | Tuesday | Wed | Thurs | Next week’s Monday. |
| 1 | 6/14 | Syllabus and “How to Succeed in Logic” | A1. What is Logic? | A2. Arguments and Non-Arguments | A3. Argument Type | Problem Set 1 Due. Cover Syllabus, How to Succeed… and A1-A2. |
| 2 | 6/21 | A4. Argument Evaluation | A5. Counterexamples | B1. Intro Fallacies | B2. Fallacies of Relevance | Problem Set 2 Due. Covers A3-A5. |
| 3 | 6/28 | B3. Fallacies of Weak Induction | B4. Fallacies and God | C1. Categorical Logic 1 | C2. Categorical Logic 2. | Problem Set 3 Due. Covers B1-B4. |
| 4 | 7/5 | C3. Categorical Logic 3 | D1. Prop Logic 1 | D2. Prop Logic 2. | D3. Prop Logic 3. | Exam 1 Due. Covers A1 to C3. |
| 5 | 7/12 | D4. Prop Logic 4. | D5. Pred. Logic | E1. Probability 1 | E2. Probability 2 | Problem Set 4 Due. Covers D1-D5. |
| 6 | 7/19 | E3. Statistics 1 | E4. Statistics 2 | E5. Causal Reasoning | Scientific Reasoning | Problem Set 5 Due |
| 7 | 7/26 | Moral and legal arguments | TBA | TBA | Exam 2 Due | Class is done! |