

Introduction to Formal Logic

(PHIL 230-07; #14377)

C S U Northridge
Room: Jerome Richfield 246
Time: M/W 4:00–5:15
Fall 2026

Instructor: Dr. John Birmingham
Office: Sierra Tower 531
Office Hours: T/R 1–2:15; W 11:30–12:45
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Catalog Description

Introduction to modern deductive logic; includes propositional logic and theory of quantification. (Available for General Education, Basic Skills Area 1B Critical Thinking.)

Prerequisites: Completion of the lower division writing requirement; GE Basic Skills Area 2 Mathematical Concepts and Quantitative Reasoning or MATH 210.

Student Learning Outcomes

By the end of the semester, students will accomplish the following:

1. Explain and apply the basic concepts essential to a critical examination and evaluation of argumentative discourse;
2. Use investigative and analytical thinking skills to examine alternatives, explore complex questions and solve challenging problems;
3. Synthesize information in order to arrive at reasoned conclusions;
4. Evaluate the logic and validity of arguments, and the relevance of data and information;
5. Recognize and avoid common logical and rhetorical fallacies.

The Student Learning Outcomes (SLOs) are achieved through the Course Objectives (COs). Each SLO is targeted by one or more COs, and each CO targets one or more SLOs. The course activities are designed to meet specific COs, and the student performance during these activities is monitored and assessed. The activities include lectures, tests, quizzes, and examinations. Additional activities such as recitations, critiques, and other comparable occurrences may be included. They are effective means of meeting the COs, hence achieving the SLOs through the COs.

Course Description

This course satisfies the “Critical Thinking” component of the “Basic Skills” section of the General Education Program, which recognizes critical reasoning as a fundamental competence. Courses in this part of General Education take reasoning itself as their focus. Their goals are to provide students with criteria and methods for distinguishing good reasoning from bad and to help students develop basic reasoning skills that they can apply both within a broad range of academic disciplines and outside the academic environment. Students are expected to acquire skill in recognizing the logical structure of statements and arguments, the ability to distinguish rational from non-rational means of persuasion, skill in applying the principles of sound reasoning in the construction and evaluation of arguments, and an appreciation of the value of critical reasoning skills in the pursuit of knowledge.

To accomplish these goals, we will focus our attention on the formal properties of deductive reasoning, primarily by undertaking a sustained examination of the propositional and predicate calculi of first-order logic. Our emphasis will be on the analysis of basic concepts, the translation of statements into symbolic

notation, and the construction of formal proofs. To a lesser extent, we will also reflect on some of the more interesting philosophical aspects of logic.

Textbook

Chapters 1, 6, 7, and 8 of *A Concise Introduction to Logic*, by Patrick J. Hurley. (In the 13th edition, Lori Watson is also listed as an author.) Any edition from the 10th onward is acceptable, and many used copies can be found online. A pdf of the 11th edition can be found [here](#) for free.

Contact Information and Tech Support

- My **office hours** during Fall 2026 semester will be T/R 1–2:15; W 11:30–12:45 (in ST 531). In addition, you can contact me any time at my CSUN email address above (and below). (If you try to contact me through Canvas, you likely won't get a response.)
- Occasionally, I will post announcements. You can view them in the **Announcements** thread at the top of the **Homepage** on our Canvas website.
- I will also post your grades so that you can view them anytime by clicking on **Grades** in the Navigation Bar to the left of the **Homepage**. Be sure to check them periodically and contact me immediately if there are any mistakes.
- I can be reached at john.birmingham@csun.edu for any questions you have about the course. Be sure to tell me in the email which course you are taking. I will do my best to respond to emails within forty-eight hours (except on Saturdays and Sundays). Please restrict your inquiries to questions not already answered in the **Syllabus**. Otherwise, you should not expect a response.
- Please do *not* contact me for tech support. Instead, contact the **IT Help Center** at 818-677-1400 or online [here](#).

Time Commitment

This is a full semester, three-unit course. The material can be quite difficult—though, of course, you're encouraged to ask questions (in class, during office hours, at the tutoring center, or by email) about anything you're having difficulty with. It involves a great deal of very careful analysis and precise evaluation. But for those willing to put forth the effort, it is certainly doable. To do it well, however, you should expect to spend *at least two hours per week* on average (outside of class time).

Course Structure and Content

Here is a short outline of the course (with readings). You can find the readings on our Canvas course website by clicking on the following series of links: **My Courses > Canvas Homepage > PHIL 230**. Page numbers are from the 10th edition of the text.

A. Introduction

B. Basic Concepts

- 1.1 Arguments, Premises, and Conclusions, 1–8.
- 1.2 Recognizing Arguments, 14–16 only.
- 1.3 Deduction, 32–34 only.
- 1.4 Validity, Truth, Soundness, 42–45 only.
- 1.5 Argument Forms: Proving Invalidity, 54–60.

***** 1ST EXAM (9/16) *****

C. Propositional Logic: Truth Tables

- 6.1 Symbols and Translation, 290–298.
- 6.2 Truth Functions, 302–311.
- 6.3 Truth Tables for Propositions, 313–319.
- 6.4 Truth Tables for Arguments, 321–324.
- 6.5 Indirect Truth Tables, 325–331; Summary, 348–49 (first four ¶s).

*** 1ST EXAM (10/14) ***

D. Propositional Logic: Natural Deduction

- 7.1 Rules of Implication I, 350–356.
- 7.2 Rules of Implication II, 361–366.
- 7.3 Rules of Replacement I, 370–376.
- 7.4 Rules of Replacement II, 381–385.
- 7.5 Conditional Proof, 391–395.
- 7.6 Indirect Proof, 397–400.
- 7.7 Proving Logical Truths, 402–404; Summary, 404–405 (first four ¶s).

*** 2ND EXAM (11/9) ***

E. Predicate Logic

- 8.1 Symbols and Translation, 406–413.
- 8.2 Using the Rules of Inference, 415–424.
- 8.3 Change of Quantifier Rules, 425–428.
- 8.4 Conditional and Indirect Proof, 430–434.
- 8.5 Proving Invalidity, 474–479.
- 8.6 Relational Predicates and Overlapping Quantifiers, 441–450.
- 8.7 Identity, Numerical Statements, and Definite Descriptions, 453–462; Summary, p. 467.

F. Conclusion

*** FINAL EXAM (12/14) ***

Assignments and Grading

There are three types of graded assignments in this course: homework, exams, and a cumulative quiz. The homework will be submitted online in Canvas. Grades can be checked at any time by clicking on **Grades** in the Navigation Bar to make sure the assignments have been submitted properly and graded. If there is any discrepancy, be sure to contact me at once.

- **Homework** (no points, self-guided). I will assign homework daily. Although I will *not* grade it, I strongly suggest that you do it. The exercises and solutions for each section will be posted on Canvas. If you need some guidance working through the exercises, several options are available: Google's Gemini, the philosophy department's tutoring center, and me (either in class, by email, or during office hours).
- **Three Midterm Exams** (40 points each) on 9/16, 10/14, and 11/9. Each exam will be objective, non-cumulative, and emphasize reasoning skills as well as factual knowledge. **I will drop your lowest score.**
- **Final Exam** (40 points) on Monday, December 14 from 5:30 pm to 7:30 pm. It will cover material introduced after the third midterm and emphasize reasoning skills as well as factual knowledge. It, too, will be objective and non-cumulative.

- **Cumulative Quiz** (5 points **extra credit**). A short objective quiz over the basic content of the course. It will be available, along with the final exam, during the final exam period.

Grading Standards

Final %	93↑	90-92.9	87-89.9	83-86.9	80-82.9	77-79.9	73-76.9	70-72.9	67-69.9	63-66.9	60-62.9	59.9↓
Letter Grade	A	A–	B+	B	B–	C+	C	C–	D+	D	D–	F

Late Policy and Drops

The Final Exam has a due date **that cannot be violated**. No make-ups will be allowed. The same is true for the Cumulative Quiz. However, if you miss one of the midterms, you can take a make-up for it during the Final Exam period right after the Final. But be careful. Missing multiple assignments can result in being dropped from the course, so make sure you keep up.

Regulations

General Course Policies

1. *Email*: Please include the course number and day/time in all correspondence.
2. *Assignments*: Must be completed on time unless other arrangements have been made with me *before* the due date.
3. *Inactivity*: You may be dropped from the course due to inactivity or uncompleted assignments. If you fail to meet mandatory deadlines, and/or are inactive for more than one full week, your overall performance will be assessed and you may be dropped.
4. *Drops*: You are responsible for dropping yourself from the course.
5. *Discipline*: Consult the University's policies on cheating, plagiarism, and classroom behavior. In addition, anyone caught cheating or plagiarizing on any assignment will, at the very least, receive a zero for that assignment and, possibly even be expelled from the school. Honesty is the best policy! Those who abide by these regulations will reap the benefits of their good behavior.

Use of Artificial Intelligence

The following is our course policy on AI:

- No answers generated by any AI tool—such as ChatGPT—are acceptable for any assignment.
- If you use text generated by AI on any assignment, I will treat it as a case of plagiarism (see below).
- The immediate penalty for using text generated by AI is an automatic 0 for the assignment. **FAIR WARNING**: I have access to software that detects AI-generated text.
- For other potential forms of discipline, see above.

Plagiarism

Plagiarism is the act of presenting someone else's work as one's own. Examples include

- Copying and pasting text from websites or other electronic sources and presenting it in an assignment as your own original work
- Copying and pasting text from printed sources (including books, magazines, encyclopedias or newspapers) and presenting it in an assignment as your own work
- Using another student's work and claiming it as your own original work (even if you have the permission of the other student)

Cheating

Cheating is the act of pretending (or helping others to pretend) to have mastered course material through misrepresentation. Examples include:

- Copying in whole or in part from another student's test or paper
- Allowing another student to copy from your test or assignment

- Using the textbook, course handouts, or notes during a test without instructor permission
- Stealing, buying, or otherwise obtaining all or part of a test before it is administered
- Selling or giving away all or part of a test before it is administered
- Having someone else attend a course or take a test in your place
- Attending a course or taking a test for someone else
- Failing to follow test-taking procedures, including talking during the test, ignoring starting and stopping times, or other disruptive activity
- Using artificial intelligence (AI) to generate content and presenting it as your own

Fabrication

Fabrication is the intentional use of invented information. Examples include:

- Signing a roll sheet for another student
- Giving false information to college personnel
- Answering verbal or written questions in an untruthful manner
- Inventing data or sources of information for research papers or other assignments; this includes the use of false information provided by artificial intelligence (AI) generators

As members of the CSUN learning community, students are not to engage in any form of academic dishonesty. Any act of academic dishonesty will be considered a very serious offense that is subject to disciplinary action, such as dismissal from the course, failure for the course, academic suspension, etc.

Important Dates

The CSUN Academic Calendar for Spring 2026, including all important dates, can be found [here](#).

Possible Amendments

I reserve the right to change this syllabus, with fair warning, at any time.