

**PHIL 4 Course Outline as of Fall 2024****CATALOG INFORMATION**

Dept and Nbr: PHIL 4 Title: INTRO SYMBOLIC LOGIC

Full Title: Introduction to Symbolic Logic

Last Reviewed: 4/12/2021

| Units   |      | Course Hours per Week |      | Nbr of Weeks | Course Hours Total |       |
|---------|------|-----------------------|------|--------------|--------------------|-------|
| Maximum | 3.00 | Lecture Scheduled     | 3.00 | 17.5         | Lecture Scheduled  | 52.50 |
| Minimum | 3.00 | Lab Scheduled         | 0    | 17.5         | Lab Scheduled      | 0     |
|         |      | Contact DHR           | 0    |              | Contact DHR        | 0     |
|         |      | Contact Total         | 3.00 |              | Contact Total      | 52.50 |
|         |      | Non-contact DHR       | 0    |              | Non-contact DHR    | 0     |

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

This class focuses on the development of modern symbolic logic through first-order predicate logic plus identity, with an emphasis on translation and proof techniques. It provides a basis for understanding recent analytic trends.

**Prerequisites/Corequisites:****Recommended Preparation:**

Concurrent enrollment or completion of ENGL 100 OR EMLS 100 (formerly ESL 100) ; AND  
Concurrent enrollment or completion of MATH 150A or MATH 150.

**Limits on Enrollment:****Schedule of Classes Information:**

Description: This class focuses on the development of modern symbolic logic through first-order predicate logic plus identity, with an emphasis on translation and proof techniques. It provides a basis for understanding recent analytic trends. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Concurrent enrollment or completion of ENGL 100 OR EMLS 100

(formerly ESL 100) ; AND Concurrent enrollment or completion of MATH 150A or MATH 150.

Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

### **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

|                   |             |                                       |                   |                  |
|-------------------|-------------|---------------------------------------|-------------------|------------------|
| <b>AS Degree:</b> | <b>Area</b> |                                       | <b>Effective:</b> | <b>Inactive:</b> |
|                   | B           | Communication and Analytical Thinking | Fall 1981         |                  |

|                |                      |  |                   |                  |
|----------------|----------------------|--|-------------------|------------------|
| <b>CSU GE:</b> | <b>Transfer Area</b> |  | <b>Effective:</b> | <b>Inactive:</b> |
|----------------|----------------------|--|-------------------|------------------|

|               |                      |  |                   |                  |
|---------------|----------------------|--|-------------------|------------------|
| <b>IGETC:</b> | <b>Transfer Area</b> |  | <b>Effective:</b> | <b>Inactive:</b> |
|---------------|----------------------|--|-------------------|------------------|

|                      |              |                   |           |                  |
|----------------------|--------------|-------------------|-----------|------------------|
| <b>CSU Transfer:</b> | Transferable | <b>Effective:</b> | Fall 1981 | <b>Inactive:</b> |
|----------------------|--------------|-------------------|-----------|------------------|

|                     |              |                   |           |                  |
|---------------------|--------------|-------------------|-----------|------------------|
| <b>UC Transfer:</b> | Transferable | <b>Effective:</b> | Fall 1981 | <b>Inactive:</b> |
|---------------------|--------------|-------------------|-----------|------------------|

#### **CID:**

|                            |                |
|----------------------------|----------------|
| CID Descriptor:PHIL 210    | Symbolic Logic |
| SRJC Equivalent Course(s): | PHIL4          |

#### **Certificate/Major Applicable:**

Major Applicable Course

### **COURSE CONTENT**

#### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Reduce complex English sentences into the simpler component parts.
2. Translate typical English connectives.
3. Perform valid proofs for valid arguments using the statement logic.
4. Perform valid proofs in the predicate logic using four additional quantifier rules as extension of the statement logic.

#### **Objectives:**

At the conclusion of this course, the student should be able to:

1. Distinguish arguments from non-arguments in ordinary language.
2. Examine ordinary statements for ambiguity, equivocation and clarity.
3. Generate translations from ordinary language into symbolic notations.
4. Distinguish valid from invalid argument forms.
5. Analyze complex expression into simple forms.
6. Determine truth values for complex expressions.
7. Deduce valid conclusions using proof strategies and rules.
8. Develop first-order predicate logic as an attempt to provide a method of analysis and as a possible foundation for mathematics.
9. Evaluate recent analytic philosophical positions using symbolic notations.
10. Describe the relation between modern symbolic notations and other formal systems, for example, computer languages.
11. Trace the historical development of modern symbolic logic and show the attempt to base mathematics on the foundation of the extended predicate logic.

12. Translate English statements with “or” “and” “if, then” “not” into the statement logic notation.

### Topics and Scope:

- I. The Nature of Logic, Arguments, and Deduction
- II. Ordinary Language, the Components of Sentences, and Symbolic Notation
- III. Statement Logic and Well-Formed Expressions
- IV. Proof Development
  - A. Truth Table Construction
  - B. Truth Table Analysis for Arguments and Complex Expressions
  - C. Truth Trees
  - D. Rules of Natural Deduction
- V. Predicate Logic
- VI. Translation into Quantified Expressions
- VII. Quantification Rules
- VIII. Identity Theory
- IX. Modern Formal Systems
- X. Identify Ambiguous and Equivocal Statements

Other topics may include:

- XIV. The Relation between Logic and Computer Systems

### Assignment:

- 1. Read approximately 50 pages of text per week
- 2. Complete weekly chapter end problems
- 3. Demonstrate problem solving skills, including demonstrations and proofs, in small group class discussion on a weekly basis
- 4. Problem-solving exams (2-5)
- 5. Weekly in-class quizzes
- 6. Final exam
- 7. Additional assignments may include: Individual problem-solving presentation

### Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing  
0 - 0%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, in-class demonstrations and proofs, problem solving presentation(s)

Problem solving  
40 - 70%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Quizzes, problem solving exams, Final

Exams  
30 - 60%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

None

Other Category  
0 - 0%

**Representative Textbooks and Materials:**

Introduction to Logic. 15th ed. Copi, Irving. Prentice Hall. 2019

Introduction to Logic. 3rd ed. Gensler, Harry. Routledge. 2016 (classic)

A Concise Introduction to Logic. 12th ed. Hurley, Patrick J. Wadsworth Publishing. 2014 (classic)

The Logic Book. 6th ed. Bergmann, Merrie. McGraw Hill. 2013 (classic)

Logic: The Laws of Truth. Smith, Nicholas JJ. Princeton University Press. 2012 (classic)

Language Proof and Logic. Barwise, Jon and Etchemendy, John. University of Chicago Press. 2011 (classic)

Formal Logic: Its Scope and Limits. 4th ed. Jeffrey, Richard. Hackett Publishing Co. 2006 (classic)

Modern Logic: A Text in Elementary Symbolic Logic. Forbes, Graeme. Oxford University Press. 1994 (classic)