

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

PHILOSOPHY 130 – LOGIC

3 hours lecture, 3 units

Catalog Description

This course teaches “correct thinking” by looking at the various conclusions or “inferences” we make about things based on the information we’re given. These inferences are either deductive or inductive. Deductive inferences are the kinds of conclusions we make that follow with strict necessity, much like the answers we get in math. For example, if there were two oranges and two apples on the table, we could “deduce” there are four pieces of fruit on the table with 100% certainty. Inductive inferences, on the other hand, are the kinds of conclusions we arrive at with varying degrees of probability. They’re less certain, but usually more interesting and problematic than deductive inferences. For example, an inductive inference would be seeing dark clouds in the sky and concluding it will soon rain. It’s not 100% certain, but more or less likely. Being able to understand the nature of these inferences, the rules behind them, and the many mistakes we make in arriving at them is crucial for evaluating the arguments of others and for developing arguments of our own. This course will explore the methods used to determine how to make good arguments as well as the ways to avoid making bad ones.

Prerequisite

None

Course Content

- 1) Students will learn that their everyday sentences contain a logical commitment, that a series of sentences may form either a mere juxtaposition or a reasoned sequence, that if they form a reasoned sequence this may be either valid or invalid, and that the conclusion may be either certain or probable. Students will also learn to distinguish problems concerning validity from problems concerning truth.
- 2) A substantial portion of the course will address:
 - a. Validity, determined by analyzing whether the conclusion of an argument follows necessarily from its premises.
 - b. Symbolization, by which we represent propositional statements and their relevant connectors for purposes of establishing validity.
 - c. Truth tables, which ascertain the nature of and relationship between propositions given various truth values of their components.
 - d. Natural deduction proof method, in which we begin by assuming the truth of the premises and use logical axioms to arrive at the conclusion.

Course Objectives

Students will be able to:

- 1) Identify and differentiate between inductive and deductive reasoning.
- 2) Identify and describe the correct forms of reasoning for both inductive and deductive arguments.
- 3) Identify and explain fallacious reasoning in both inductive and deductive arguments.
- 4) Formalize ordinary language propositions and arguments into symbolic terms.
- 5) Detect fallacies and evaluate the forms of argument used in newspaper articles, advertisements, scientific articles, etc., as regards to their validity.
- 6) Use the rules of deduction to prove the invalidity of various arguments.
- 7) Use truth tables to determine validity.
- 8) Use the method of natural deduction in sentential logic to determine validity.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Research assignments that measure students' ability to evaluate arguments found in the mass media on the basis of their strength and validity.
- 2) Written assignments that measure students' ability to formulate standard form arguments given ordinary language essays and articles.
- 3) Periodic quizzes that measure students' ability to apply the rules of induction and deduction to a variety of argument forms and determine their strength/validity.
- 4) Exams that measure students' ability to recognize and evaluate argument forms with regard to fallacies and validity.

Special Materials Required of Student

None

Minimum Instructional Facilities

Standard classroom

Method of Instruction

- 1) Lecture and discussion
- 2) Audiovisual, multimedia presentations

Out-of-Class Assignments

- 1) Writing assignments, including essays
- 2) Reading assignments
- 3) Apply terms and theories discussed in class to solve logic problem sets

Texts and References

- 1) Required (representative examples):
 - a. Hurley, Patrick. *A Concise Introduction to Logic*. 14th edition, Cengage, 2024. (available March 2023).
 - b. Copi, Irving and Carl Cohen. *Introduction to Logic*, 14th edition. Prentice Hall, 2010.
- 2) Supplemental: None

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Identify and differentiate between inductive and deductive reasoning.
- 2) Identify and explain fallacious reasoning in both inductive and deductive arguments.
- 3) Use the rules of natural deduction to prove the invalidity of various arguments.