EL CAMINO COLLEGE
COURSE OUTLINE OF RECORD – Approved

I. Course Information
Subject: PHIL
Course Number: **106**
Descriptive Title: **Introduction to Symbolic Logic**
Division: **Behavioral and Social Sciences**
Department: **Philosophy**
Course Disciplines: **Philosophy**

Catalog Description:
This course focuses on the representation of arguments for formal analysis, and the skills and techniques needed to do so effectively. The focus will be on the basic elements of classical and propositional logic with a brief introduction to predicate logic.

Conditions of Enrollment:
Recommended Preparation: English 1 or eligibility for English 1A or qualification by appropriate assessment

Course Length:

Hours Lecture (per week):   3
Hours Laboratory (per week):   0
Outside Study Hours: 6
Total Hours: 54

Course Units: 3

Grading Method: Letter Grade only
Credit Status: Credit, degree applicable

Transfer CSU: Yes **Effective Date:** Prior to July 1992
Transfer UC: Yes **Effective Date:** Prior to July 1992

General Education:
ECC
Area 4B - Language and Rationality: Communication and Analytical Thinking
Term: **Other: Approved**

CSU GE:
Area A3 - English Language Communication and Critical Thinking: Critical Thinking
Term: **Other: Approved**

IGETC:
Term: **Other:**

II. Outcomes and Objectives
A. Student Learning Outcomes (SLOs) (The course student learning outcomes are listed below.)

SLO #1 Logical Structure of Arguments
Students will recognize the logical structures of arguments, and be able to put arguments into forms suitable for symbolization and subsequent assessment.

SLO #2 Logical Strength of Arguments
Students will be able to explain the difference between truth and the logical strength of argument forms, and demonstrate this knowledge through the assessment of formal and/or popular examples of reasoning processes.

SLO #3 Testing Symbolized Arguments
Students will be able to test symbolized arguments for validity by using standard methods for propositional, categorical, and/or predicate logic evaluations.

B. Course Objectives (The major learning objective for in this course are listed below)

1. Differentiate between deductive and inductive arguments.
2. Examine forms of categorical statements and analyze them by means of the squares of opposition and operations.
3. Determine the validity of categorical syllogisms, employing Venn diagrams and/or syllogistic rules.
4. Translate English sentences into sentential logical form, using truth functional operators.
5. Construct truth tables both full, and indirect to test statements and arguments in sentential logic.
6. Construct formal proofs of validity using established truth functional principles and rules.
7. Transform sentential formulas into predicate logic formulas.
8. Complete enthymeme and sorites in a form that would allow formal evaluation of such arguments.
9. Differentiate between truth, validity and argument soundness through both definition and analysis of presented arguments.
10. Identify premises and conclusions of a variety of deductive argument forms, and restate these arguments in standard form.
11. Identify a variety of fundamental deductive argument patterns.

III. Outline of Subject Matter
(Topics should be detailed enough to enable an instructor to determine the major areas that should be covered to ensure consistency from instructor to instructor and semester to semester.)

Major Topics

I. The Nature of Logic (6 hours, lecture)
    A. Definitions: Types and Criteria
    B. Types of Deductive Argument
    C. Basic Evaluative Concepts - Truth, Validity and Soundness

II. Categorical Logic (11 hours, lecture)
    A. Statements and Statement Forms
    B. Techniques for Translating into Categorical Statements
    C. Square of Opposition - Traditional and Modern
    D. Conversion, Obversion, Contraposition
    E. Syllogistic Forms and Reduction of Terms
    F. Assessment by Venn Diagrams and Rules
    G. Enthymemes

III. Propositional Logic (21 hours, lecture)
A. Analysis of truth-functions, truth-functional compounds, and well-formed formulas
B. Analysis of truth-functional operators
C. Translating natural language statements to a formal language of propositional logic through proper symbolization and syntax with the goal of preserving semantic content
D. Truth Tables Analysis
E. Rules of Inference in propositional logic
F. Replacement Rules in propositional logic
G. Natural deduction (derivations) in propositional logic for establishing validity, inconsistency, and truth-functional entailment

IV. Predicate Logic (16 hours, lecture)
A. Expanding propositional logic to include predicates and quantifiers
B. Rigorously defining what constitutes a well-formed formula in predicate logic
C. Translating natural language statements to a formal language of predicate logic through proper symbolization and syntax with the goal of preserving semantic content|
D. Rules of inference in predicate logic
E. Replacement rules in predicate logic
F. Natural deduction (derivations) in predicate logic for establishing validity, inconsistency, and truth-functional entailment

Total Lecture Hours: 54
Total Laboratory Hours: 0
Total Hours: 54

IV. Primary Method of Evaluation and Sample Assignments
A. Primary Method of Evaluation (choose one):

1) Substantial writing assignments

B. Typical Assignment Using Primary Method of Evaluation

Typical Assignment Using Primary Method of Evaluation:
Analyze selected/assigned exercises in/from your textbook, according to the techniques and skill relevant to those assignments.

C. College-level Critical Thinking Assignments

Critical Thinking Assignment 1:
Using deductive logic principles and techniques, create one sound and one unsound argument, which you explain in terms of these principles and techniques.

Critical Thinking Assignment 2:
Using one or more deductive arguments, write a three-page paper defending a claim pertaining to the following issue: Should there be restrictions on what college professors can say in the courses they teach? In an Appendix, explain why your argument is sound, in terms of principles we use in this course.

D. Other Typical Assessment and Evaluation Methods

Homework Problems, Multiple Choice, Objective Exam, Quizzes, Other (specify): Classwork: problem solving ability

V. Instructional Methods
Discussion, Group Activities, Lecture, Multimedia presentations

If other:

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. Work Outside of Class
Answer questions, Problem solving activity, Required reading, Study

If Other:

VII. Texts and Materials
A. Up-to-date Representative Textbooks: (Please use the following format: Author, Title, Edition, Publisher, Year. If you wish to list a text that is more than 5 years old, please annotate it as a "discipline standard".)

Paul Herrick, Introduction to Logic, 1st ed., Oxford University Press, 2012. Discipline Standard

Patrick J. Hurley, A Concise Introduction to Logic, 12th ed., Wadsworth Publishing, 2014. Discipline Standard.

Frances Howard-Snyder, Daniel Howard-Snyder, Ryan Wasserman, The Power of Logic, McGraw-Hill Humanities, 2012. Discipline Standard.

B. Alternative Textbooks: (Please use the following format: Author, Title, Edition, Publisher, Year. If you wish to list a text that is more than 5 years old, please annotate it as a "discipline standard".)

Jack Nelson, James H. Moor, and Merrie Bergmann, The Logic Book, 6th ed., McGraw-Hill Education, 2013. Discipline Standard

C. Required Supplementary Readings

D. Other Required Materials

VIII. Conditions of Enrollment
A. Requisites (Course Prerequisites and Corequisites) Skills needed without which a student would be highly unlikely to succeed.

Requisite:
Category:
Requisite course:
Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).

B. Requisite Skills: (Non-Course Prerequisite and Corequisites) Skills needed without which a student would be highly unlikely to succeed.

Requisite:
Requisite and Matching Skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable

C. Recommended Preparations (Course) (Skills with which a student's ability to succeed will be strongly enhanced.)

Requisite course: English 1 or

Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).
This course involves reading college level textbooks, developing written reports, and answering essay questions. A student's success in this class will be enhanced if they have these skills.
ENGL 1 - Summarize, analyze, evaluate, and synthesize college-level texts.
ENGL 1 - Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process.

D. Recommended Preparation (Non-Course) (Skills with which a student's ability to succeed will be strongly enhanced.)

Requisite: eligibility for English 1A or qualification by appropriate assessment

Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable
This course involves reading college level textbooks, writing assignments, and answering essay questions. A student's success in this class will be enhanced if they have these skills.

E. Enrollment Limitations

Enrollment Limitations and Category:
Enrollment Limitations Impact:

Course Created by: Robert C. Patch   Date: 02/01/1956

Board Approval Date:

Last Board Approval Date: 12/21/2020

Last Reviewed and/or Revised by: Roberto Garcia   Date: 10/07/2020