Logic

Course Objectives:

Course description:
This course will discuss the forms and functions of language, theories of deductive logic, and inductive methods. The course will emphasize on the skills of understanding complex materials by analyzing their logical structures, and the skills of constructing clear and convincing arguments by following the basic logical principles. A computer program will be used in the course to help students to grasp the skills of logical analysis.

Course Content:
This course will introduce students to a significant body of philosophical literature on the principles of correct reasoning, will introduce students to the questions, methods and approaches of the discipline of logic, and will emphasize balanced argument and critical thought.

Student Outcomes:
Students will acquire knowledge of a significant body of philosophical literature on the principles of correct reasoning, will gain practice in exploring the questions, methods and approaches of the discipline of logic, and will acquire skill in emphasize balanced argument and critical thought.

Required Texts:


Grades and Assignments:
Students will be graded on the basis of weekly homework (20%), two tests (20% each), one final exam (30%), and class attendance/participation (10%).

Homework: Students will be assigned homework every week. Assignments will be given in Friday classes, and due in next Monday classes.

Class attendance/participation: Student are expected to read all the assigned materials prior to the class, and to attend class and computer lab regularly.

Course Outline:

Part One: Language
This part discusses the functions and forms of language, the structures of argument, and the typical errors in reasoning.
1.1 Introduction
1.2 Arguments
Readings: A Concise Introduction to Logic, 1.1; 1.2; 1.4.
2.1 Definition
Readings: A Concise Introduction to Logic, 2.4; 2.5.
2.2 Fallacies
Readings: A Concise Introduction to Logic, 3.1; 3.2; 3.3; 3.4.
2.3 Computer Lab
Logic Coach: Analyzing arguments; Definitions.

Part Two: Categorical Logic
This part studies the theory of the syllogism and categorical logic. Emphasis will be given to the techniques of Venn diagram.
3.1 Categorical Statements
Readings: A Concise Introduction to Logic, 4.1; 4.2.
3.2 Venn Diagram
Readings: A Concise Introduction to Logic, 4.3; 4.4.
3.3 Computer Lab
Logic Coach: Venn diagrams.
4.1 Translating Ordinary Language
Readings: A Concise Introduction to Logic, 4.7.
4.2 Categorical Syllogisms
Readings: A Concise Introduction to Logic, 5.1; 5.2.
4.3 Computer Lab
Logic Coach: Translating categorical statements.
5.1 Holiday (2/15); no class
5.2 Arguments in Ordinary Language
Readings: A Concise Introduction to Logic, 5.4; 5.5.
5.3 Incomplete and Chain Arguments
Readings: A Concise Introduction to Logic, 5.6; 5.7.
6.1 Review
6.2 Test 1 (2/24)

Part Three: Propositional Logic
This part studies the theory of elementary symbolic logic. The focuses include the skills of translating ordinary language into its symbolic form, and the techniques of truth tables and truth trees.
6.3 The Connectives in Propositional Logic, I
Readings: A Concise Introduction to Logic, 6.1.
7.1 The Connectives in Propositional Logic, II
Readings: A Concise Introduction to Logic, 6.2.
7.2 Truth Tables, I
Readings: A Concise Introduction to Logic, 6.3.
Part Four: Natural Deduction

This part studies the technique of natural deduction, and discusses how to construct valid and convincing arguments based upon the natural deductive processes illustrated by formal proofs.

10.2 The Rules of Inference, I
Readings: A Concise Introduction to Logic, 7.1.

10.3 Computer Lab
Logic Coach: Inference rules.

12.2 The Rules of Inference, II
Readings: A Concise Introduction to Logic, 7.2.

12.3 Computer Lab
Logic Coach: Inference rules.

13.1 The Rules of Replacement, I
Readings: A Concise Introduction to Logic, 7.3.

13.2 The Rules of Replacement, II
Readings: A Concise Introduction to Logic, 7.4.

13.3 Computer Lab
Logic Coach: Replacement rules.

14.1 Academic Conference (4/19); no class

14.2 Strategies
Readings: A Concise Introduction to Logic, 7.4.

14.3 Computer Lab
Logic Coach: Replacement rules.

15.1 Conditional Proofs
Readings: A Concise Introduction to Logic, 7.5.

15.2 Indirect Proofs
Readings: A Concise Introduction to Logic, 7.6.
15.3 Computer Lab

*Logic Coach*: Conditional proofs.

**Part Five: Induction and Other Applications**

This part introduces several inductive methods (analogy, enumeration, causal connection), as well as the applications of logic in standardized exams such as GRE and LSAT.

**16.1 Inductive generalization**

Readings: *A Concise Introduction to Logic*, 9.1; 9.2.

**16.2 Hypothetical reasoning**

Readings: *A Concise Introduction to Logic*, 13.1; 13.2; 13.3.

**16.3 Wrapping up**

This syllabus is subject to change at the discretion of the instructors.

*California Lutheran University* is committed to providing reasonable accommodations to students with various documented disabilities (physical, learning or psychological). If you are a student requesting accommodations for this course, please contact your professor at the beginning of the semester and register with the Coordinator for Students with Disabilities (Pearson Library, Center for Academic and Accessibility Resources, Ext. 3260) for the facilitation and verification of need. Faculty will work closely together with you and your coordinator to provide necessary accommodations.

[Return to Xiang Chen’s Teaching Page]