



MERCER
COUNTY COMMUNITY COLLEGE

COURSE OUTLINE

Course Number	Course Title	Credits
PHI-113	Logic	3.0
Hours: Lecture/Lab/Other 3/0/0	Co- or Pre-requisite ---	Implementation Semester & Year FA 2022

Catalog description:

An introduction to the principles and methods of correct reasoning. A problem-solving approach to the nature and scope of different kinds of logic, identifying and evaluating arguments and fallacies, and crafting well-formed arguments. 3 lecture hours

General Education Category:

Goal 6: Humanities

Course coordinator:

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Required texts & Other materials:

Logic and Philosophy 13th edition Publisher Wadsworth; Hausman, Boardman and Kahane, ISBN: 978-1624669354

How to Think Logically 2nd edition Publisher Pearson; Gary Seay and Susana Nuccetelli ISBN 13: 978-0-205-15498-7

Handouts & Websites as directed; for updated editions/similar text-check bookstore

Course Student Learning Outcomes (SLO):

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

1. Basic logical technical language and the role of form, including formal validity, soundness, strength and cogency and their relation to truth; (ILGs: 1, 6, 9, 11) (PLOs 1, 2, 3, 4)
2. Informal logical argument analysis, including familiarity with standard fallacies; (ILGs: 1, 6, 9, 11) (PLOs 1, 2, 3, 4)
3. Understand the idea and basic practices of logical proofs, including syllogisms; (ILGs: 1, 9, 11) (PLOs 1, 2, 3, 4)
- 4.. Construct truth tables and employ natural deduction techniques using basic derivation rules; (ILGs: 1, 6, 9, 11) (PLOs 1, 2, 3, 4)

5. Apply logical techniques to translate and evaluate arguments in English and basic logical Notation. (ILGs: 1, 6, 11) (PLOs 1, 2, 3, 4)

Course-specific Institutional Learning Goals (ILG):

Institutional Learning Goal 1. Written and Oral Communication in English. Students will communicate effectively in both speech and writing.

Institutional Learning Goal 6. Humanities. Students will analyze works in the fields of art, music, or theater; literature; philosophy and/or religious studies; and/or will gain competence in the use of a foreign language.

Institutional Learning Goal 9. Ethical Reasoning and Action. Students will understand ethical frameworks, issues, and situations.

Institutional Learning Goal 11. Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Program Learning Outcomes for Liberal Arts (PLO)

1. Concept Knowledge Understand the vocabulary, methods, and major concepts present in the humanities, the social sciences, and the natural sciences
2. Communication Articulate complex ideas clearly and effectively, both verbally and in writing
3. Critical Thinking Perform a series of thinking tasks including speculation, analysis, and synthesis (i.e., abstract reasoning)
4. Research Methods Utilize research materials and methodologies

Units of study in detail – Unit Student Learning Outcomes:

This Logic course is designed to serve as a methodical preparation for more effective reasoning and improved cognitive skills, aimed at building knowledge, consensus and solutions. Its ambition is to develop those intellectual dispositions that are essential for effective evaluation of truth claims as well as for making reasonable decisions based on what we know or believe to know, and what we don't know. The goal here is to measurably develop the quality of our beliefs and the reasons that support them, rather than about specific content. Logic provides the means to draw conclusions from available evidence, as evidence by itself provides for no such think in itself. Thus conceived, it prepares students to tackle all kinds of problems including those important questions that do not allow an easy and definitive answer. What it offers comes down to the most rational, or at least reasonable way of resolving those problems for which all relevant information is not available but which need to be addressed here and now. In brief, this course is about the best available method of dealing with the complexity of life and language under the constraints of our limited knowledge and resources. There are established patterns of correct reasoning in formal logic and in this sense it's methodologies can seem formulaic, but the variable nature of the premises possible, there more efficient ways to apply logic than others, but there remains a wide range of paths for analysis or creativity. But there are knowledges that can be applied and techniques that can be developed that can serve to improve the thinking and actions of our students in a general, adaptive way, which can then serve as a springboard for the processes and skills in particular subjects and fields.

Units in Summary

Unit 1 – Building Blocks of Reasoning

Unit 2 – Traditional Logic

Unit 3 – Informal and Inductive Logic

Unit 4 – Formal, Symbolic Logic

Units in Detail:

Unit I: Building Blocks of Reasoning (SLO# 1, 2, 4, 5)

Learning Objectives

The student will be able to...

1. Identify reasons for studying logic and distinguish between the major subfields of logic and their central concerns
2. Explain key logical concepts such as validity, consistency, soundness, inference, inductive, deductive, etc.
3. Critically relate key elements of reasoning, including truth, definitions, arguments, relevance, Judgments

Unit II: Traditional Logic (SLO# 1, 2, 4, 5)

Learning Objectives

The student will be able to...

1. Understand the basic elements of traditional logical systems, including historical context and applications
2. Explain concepts and use techniques pertaining to standard form sentences & arguments, categorical statements, syllogisms and their attributes, etc.
3. Critically relate key elements of the traditional and modern squares of opposition, basic immediate inferences, distribution of terms, paradoxes, enthymemes, etc.

Unit III: Informal and Inductive Logic (SLO# 1, 2, 4, 5)

Learning Objectives

The student will be able to...

1. Understand the basic elements of informal and inductive logical systems, including historical context and applications
2. Explain concepts and use techniques pertaining to different types of inductive arguments, issues of strength and cogency, etc.
3. Critically distinguish between standard informal and formal fallacies, with emphasis on applications to real world articles and speeches, including application in science.

Unit IV: Symbolic Logic (SLO# 1, 2, 3, 4, 5)

Learning Objectives

The student will be able to...

1. Understand the basic elements of formal, symbolic logic, including historical context and applications
2. Explain concepts and use techniques pertaining to propositional and predicate logic, issues of validity and soundness, quantification, etc.

3. Critically employ translation skills, truth tables, natural deduction with emphasis on proof applications, including conditional and indirect proofs, modeling, etc.

Evaluation of student learning:

- Citizenship: Course-long assessment of how students demonstrate logical proficiency and practice through Their contributions to the class learning environment, that may include such factors as attendance, The amount and manner of class participation, helpfulness to other students' understanding, oral presentations, doing proofs at the board, etc.
- Homework: 6 or more short assignments aimed at having the student demonstrate that they did the assigned reading assignment and can address the issues covered in their own words.
- Quizzes: 4 or more brief assessments to allow students to demonstrate philosophical literacy in a specific unit of instruction
- Tests: 2 or more class-length assessments to allow students to demonstrate content knowledge/logical Proficiency and literacy in covered units of instruction
- Essays: no more than 1 assessment to allow students to demonstrate logical literacy and practices as applied to units of instruction. Well-argued papers are the first goal here, as a demonstration of philosophical reasoning and logic. Recommend that essays are not due in class.

Course Grade Breakdown:	Citizenship	10-15% (not more than this) (includes 'participation/board work')
	Homework	10-15% (key to encouraging regular preparation)
	Quizzes	5-15%(key to encouraging regular preparation)
	Tests	30-60% (no one test worth more than 20%)
	<u>Essays</u>	<u>0-25%</u> (no one paper worth more than 20%)
	Course =	100%

The particular grading breakdown is to be determined by each instructor and listed clearly in her/his syllabus.