Philosophy 2341(01): Logic and Critical Thinking (3 credits)
Dr. Erica L. Neely
Spring 2019

Place and Time:	Burgett 115, MWF 11:00-11:50 a.m
Email address:	e-neely@onu.edu
Office Hours:	Burgett 121, MWF 10-11 a.m., 1-2 p.m., and by appointment
Text (at bookstore):	David Kelley, *The Art of Reasoning* (4th Edition)
Web page:	https://northernonline.onu.edu/

General Education Learning Outcome: Knowledge of human thought and culture.

Aims and Objectives

The purpose of this course is to provide you with tools for thinking and reasoning well. The ability to make and evaluate different sorts of arguments and claims is useful both in various fields of academic study and in the outside world. Note that we will not be concerned with devising a philosophical account of thinking or of truth; we assume our basic grasp of these concepts is correct. As this course satisfies a learning outcome pertaining to the knowledge of human thought, part of what we will examine is how the tools for analyzing arguments have evolved over time.

There are three parts to this course, each of which is fairly self-contained. The first part introduces the basic concepts of reasoning – propositions and arguments – and discusses the classical (Aristotelian) approach to logic; we will cover a form of logic that deals with categorical syllogism and learn how to recognize and evaluate them. While the tools gained in this section are very powerful, they are restricted to a fairly narrow set of arguments.

This leads us to the second part of the course, which is devoted to modern formal logic; this is the logic of truth tables and connectives, validity and proof. We will see how propositional logic can handle types of arguments which categorical logic cannot, yet is not itself fully able to handle categorical arguments. (Talk about two steps forward and one step backwards!) Fortunately, predicate logic emerges to handle both categorical arguments and the more flexible system we developed through propositional logic.

Both of the first two units deal with deductive arguments; the last part of the course deals with inductive reasoning. Although inductive arguments may not seem as daunting as propositions in formal logic – at least there aren't any symbols there! – they are in many ways the hardest to evaluate because there are no hard and fast rules for testing arguments like there are for deductive logic. We will discuss various methods of assessing the strength of these arguments, as well as learn to identify a number of commonly committed fallacies.

Note: this course ultimately is teaching a set of skills which can only be learned through practice. **Simply coming to class and doing the homework will not be sufficient for most students to gain these skills**; you will need to do practice on your own time as well. I will, of course, be happy to work with you during my office hours to answer any questions you might have; I have also posted many resources on Moodle to help you with this. However, if you wait to see me until the week of an exam and have not been keeping on top of the material, it will likely be too late!

Grading and Homework

3 Exams (non-cumulative):	20% each
Homework:	30%
Participation:	10%

Homework is due at the **beginning** of class; late assignments will not be accepted except in extraordinary circumstances. Homework should be your own work; you may discuss it with a friend, but you each need to complete your own assignments. If you know that you will be absent on a day homework is due, please make arrangements to have a classmate hand it in or leave it in my mailbox. I will only accept homework via email by prior arrangement. **Note that I will drop the lowest homework grade.** Partial credit is generally awarded for homework and exam questions, so it is worthwhile to show your work. If I can't figure out what you're doing, I can't give you partial credit.

Participation is earned by volunteering answers to questions in class and by working with your group on in-class assignments.

If something extraordinary prevents you from attending an exam or turning an assignment in on time, please contact me as soon as possible; I will make reasonable accommodations. Please note that you are responsible for keeping track of homework assignments and exam dates. Although final grades are limited to whole letter grades, individual assignments will use the plus/minus scale; this will enable you to see whether your B is closer to an A or closer to a C.

Special Accommodations

Students requiring particular accommodations because of physical and/or learning disabilities should contact their Dean's office prior to or during the first week of classes. For additional information, see: http://www.onu.edu/student_life/disability_services

Academic Dishonesty

The University expects its students to conduct themselves in a dignified and honorable manner as mature members of the academic community and assumes that individually and collectively they will discourage acts of academic dishonesty. The University also expects cooperation among administrators, faculty, staff, and students in preventing acts of academic dishonesty, in detecting such acts, reporting them, and identifying those who commit them, and in providing appropriate punishment for offenders. The University Code of Academic Student Conduct is found in Appendix C of the Student Handbook: http://www.onu.edu/student_life/student_conduct/student_handbook

Title IX

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To report sexual misconduct (violence) or sexual harassment, students may contact the Title IX Coordinator, Nancy Sabol, (419) 772-2218, n-sabol@onu.edu or one of the Deputy Title IX Coordinators, Brian Hofman, (419) 772-1878 , b-hofman@onu.edu ; LaShonda Gurley, (419) 772-3145, l-gurley@onu.edu.

To confidentially discuss sexual misconduct (violence) or sexual harassment, students may contact University Confidential Resources: Counseling Center, (419) 772-2190; Health Center, (419) 772-2086; or Chaplain, (419) 772-2200. For more information, the University's Sexual Discrimination Policy is available at www.onu.edu/title_IX.

Day-by-Day Reading Assignments (complete reading prior to class)

Unit One – Syllogistic (Aristotelian) Logic

January

M 1/14 First day of class
W 1/16 Introduction/Propositions (1-5, 41-57); Arguments (67-72)
F 1/18 Diagrams, Implicit Premises, Inductive/Deductive Arguments (73-91)

M 1/21 **No Class – Martin Luther King's Day**
W 1/23 Categorical Propositions and Translation (145-151)
F 1/25 Square of Opposition (151-158); Venn Diagrams for Propositions (158-163)

M 1/28 Immediate Inference (163-173)
Homework Due: Argument Homework
W 1/30 Introduction to Categorical Syllogisms (179-186)

February

F 2/1 Distribution (187-189); Rules for Validity (243-250)

M 2/4 No new readings
W 2/6 Enthymemes (186-7, 196-7); Venn Diagram Test for Validity (198-203)
F 2/8 More on Venn Diagrams (no new reading)

M 2/11 Disjunctive Syllogisms (219-224); Hypothetical Propositions and Syllogisms (225-233)
Homework Due: Categorical Syllogism Handout
W 2/13 Exam Review
F 2/15 **Exam 1**

Unit Two – Formal (Propositional and Predicate) Logic

M 2/18 Propositional Logical Connectives; Translation; Introduction to Truth Tables (261-282)
W 2/20 More on Propositional Translation (no new readings)
F 2/22 Truth Tables for Propositions (282-291)

M 2/25 Truth Table Test for Validity (301-305)
W 2/27 Introduction to Equivalence and Inference Rules (311-341)

March

F 3/1 Introduction to Proofs (no new readings)

M 3/4 -F 3/8 **No Class – Spring Break**

M 3/11 More Practice with Proofs (no new readings)
W 3/13 Conditional Proof and Reductio ad Absurdum Proofs (341-351)
Homework Due: Truth Tables and Propositional Translation
F 3/15 More on CP and RA Proofs (no new readings)

M 3/18 No new readings
W 3/20 Introduction to Predicate Logic and Translation (361-376)
F 3/22 More on Predicate Translation (no new readings)

M 3/25 Predicate Proofs: Equivalence and Inference Rules: (377-388)
Homework Due: Propositional Proofs
W 3/27 Practice with Predicate Proofs (388-396)
F 3/29 Relations and Multiple Quantifiers (397-402)

April

M 4/1 Proof with Relational Statements (403-408)
W 4/3 No new readings
F 4/5 Practice Problem Day (no new readings)
Homework Due: Predicate Translation and Predicate Proofs

M 4/8 Exam Review
W 4/10 **Exam 2**

Unit Three – Informal and Inductive Logic

F 4/12 Fallacies (103-136)

M 4/15 Inductive Generalizations (417-421)
W 4/17 Causality and Mill's Methods (421-438)
F 4/19 **No Class – Easter Break**

M 4/22 **No Class – Easter Break**
W 4 /24 More on Mill's Methods; Arguments from Analogy (442-453)
Homework Due: Fallacies
F 4/26 Logic and Statistics; Using Statistics in Arguments (456-469); Statistical Generalizations (470-479)

M 4/29 More on Statistical Generalizations (no new readings)

May

W 5/1 Explanation and Adequacy (483-494); Hypotheses and Plausibility (495-503)
Homework Due: Mill's Methods and Inductive Generalizations
F 5/3 Exam Review

M 5/6 **Final Exam, 11:45 a.m. – 1:45 p.m.**