



Philosophy Syllabus

Introduction to Symbolic Logic

PHIL 2303-71124

Fall 2013 (3 Credit Hours)

Central Campus, Room SJAC 208

M, W 7:00 – 9:00 PM

Instructor: Nathan D. Smith, PhD

Northeast Campus

Codwell Hall, Room 125

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713-718-7258

Office hours: M-F, 9:00 A – 5:00 PM

Course Description:

An introduction to Symbolic Logic, focusing on Propositional Logic with some Predicate Logic, emphasizing the rules of translating language into symbols, the rules of inference and replacement, and the mechanism of reasoning used by computers. This course stresses the HCC Core Objectives of Critical Thinking, Communication Skills, Empirical and Quantitative Literacy, and Teamwork.

PREREQUISITE(S):

- ENG 1301

FREQUENT REQUISITES

- College Level Reading
- College Level Mathematics
- College Level Writing

Course Goals:

This course focuses on the technical analysis of reasoning and its applications to constructing and testing of both natural language, pictorial, and empirical arguments using a formal, symbolic system. Students learn how to recognize, analyze, and assess rational appeals in both rhetoric and science by using a formal system of logic. Students will consider both the semantic and syntactic elements of logic as it relates to simple statements as well as those that apply to classes of individuals and express relations between classes and/or individuals.

Student Learning Outcomes:

- 1. Determine** the logical structure of English arguments by identifying premises and conclusions.
- 2. Understand** basic concepts in logic, such as truth functionality, validity, soundness, counter-examples, tautology, self-contradiction, logical equivalence, logical contradictoriness, and logic consistency.
- 3. Translate** English statements into propositional and/or predicate notation.
- 4. Determine** the validity of symbolic propositional or predicate arguments using such methods as direct/indirect truth tables, natural deduction, and/or the finite universe method.

Learning Objectives:

- 1.1 Understand** the nature of logical structure in English-language arguments, including the the concepts of premises, conclusions, validity, soundness, inference, strength, and cogency.
- 1.2 Identify** premises and conclusions in English-language arguments and assess them for validity, soundness, strength, and cogency.
- 2.1 Learn** basic logical vocabulary, including types of arguments, relations between sentences, and logical operators.
- 2.2 Assess** validity, soundness, strength, cogency, logical equivalence, and logical consistency of English-language sentences.
- 2.3 Identify** English-language sentences as tautology, contradiction, or contingent sentence.
- 3.1 Learn** symbolic notation for each of the logical operators, including the truth table for each operator.
- 3.2 Translate** English-language sentences and arguments into symbolic form using a translation key.
- 4.1 Learn** the truth-table test for validity, including partial truth tables.
- 4.2 Apply** the truth table method to assessing validity (finding counterexamples), identifying tautologies, contradictions, and contingent sentences, assessing logical equivalence and consistency.
- 4.3 Learn** the basic rules of natural deduction, including rules of replacement.
- 4.4 Learn** indirect methods of proof.
- 4.5 Derive** derived rules of natural deduction.
- 4.6 Apply** the rules of natural deduction to derive desired conclusions from given premises.

Adopted Texts:

Magnus, P.D. *forallX: An Introduction to Formal Logic*

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Smith, Nathan D. *Philosophical Arguments*

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Course Calendar:

September 21	Syllabus and Introduction, "Why Logic?" <ul style="list-style-type: none">• The structure of arguments• Distinguish assertions from arguments• In-class exercises: ForallX pg. 8, Part A
September 23	Putting arguments in canonical form; inductive vs. deductive arguments; good and bad reasoning <ul style="list-style-type: none">• Homework due: ForallX pg. 8-9, Parts B, C• Reading: ForallX, 1.1-4, and Philosophical Arguments Ch. 1-3, and 7• In-class exercises: Handout 1
September 28	Review of basic concepts on arguments <ul style="list-style-type: none">• Homework: ForallX, pg. 9, Part D; study glossary terms from ForallX, Ch. 1• Reading: Philosophical Arguments 5-6• In-class exercises: Handout 2
September 30	Review and Quiz 1 <ul style="list-style-type: none">• Homework due: Worksheet 1
October 5	Additional Logical terminology; Atomic sentences and sentence translation <ul style="list-style-type: none">• Reading: ForallX 1.5-6 and 2.1• In-class exercises: Handout 3
October 7	Sentential Connectives; More translation <ul style="list-style-type: none">• Homework due: ForallX pg. 42, Part A-B• Reading: ForallX 2.2-3 and Philosophy Arguments 4• In-class exercises: ForallX pg. 42, Part C
October 12	Truth tables: Main connectives, finding the truth values of sentences, setting up truth tables

- **Homework due:** ForallX pg. 42-3, Part C; short quiz on truth tables for each sentential connective
 - **Reading:** ForallX 2.3-4
 - **In-class exercises:** ForallX pg. 50, Part A, C, E
- October 14 Truth tables of sentences and sets of sentences
- **Homework due:** ForallX pg. 50-1, Part B, D, F
 - **Reading:** ForallX 3.1-2
 - **In-class exercises:** pg. 54-5 Part A, C, E
- October 19 Truth tables test for validity
- **Homework due:** ForallX pg. 54-5, Part B, D, F
 - **Reading:** ForallX 3.3-4
 - **In-class exercises:** ForallX, pg. 55-6 Part G; ForallX pg. 59-60, Parts A-D, 1-2
- October 21 Truth tables continued
- **Homework due:** ForallX pg. 55-6 Part H; ForallX pg. 59-60, Parts A-D, 3-6
 - **Reading:** ForallX 3.4
 - **In-class exercises:** review for Mid-Term
- October 26 Mid-Term Exam
- October 28 Basic Concept of Proofs; substitution instances
- **Reading:** ForallX 4.1
 - **In-class exercises:** ForallX pg. 67-8, Part A and B (odd)
- November 2 Substitution instances; some basic rules
- **Homework due:** ForallX pg. 67-8, Part A and B (even)
 - **Reading:** ForallX 4.2
 - **In-class exercises:** ForallX pg. 68, Part C and D (odd)
- November 4 Basic rules of proof; complete partial proofs
- **Homework due:** ForallX pg. 67-8, Part A and B (even), pg. 74, Part A (even)
 - **In-class exercises:** ForallX pg. 75, Part B, 1-3
- November 9 Review and Quiz 2
- **Homework due:** ForallX pg. 75-6, Part B, 4-6
 - ****LAST DAY TO WITHDRAW****
- November 11 Using the basic rules in proofs
- **In-class exercises:** ForallX pg. 76, Part C, 1-5
- November 16 More proofs and sub-proofs
- **Homework:** ForallX pg. 76-7, Part C, 6-10

	<ul style="list-style-type: none"> • Reading: ForallX 4.3 • In-class exercises: ForallX pg. 82-3, Part A and C, 1-2
November 18	<p>More sub-proofs</p> <ul style="list-style-type: none"> • Homework due: ForallX pg. 83, Part B, 3-7 • Reading: ForallX 4.4 • In-class exercises: ForallX pg. 87, Part A, 1-2 and Part B, 1-3
November 23	<p>Review and Quiz 3</p> <ul style="list-style-type: none"> • Homework due: ForallX pg. 87-90, Part A, 3-4, Part B, 4-7
November 25	NO CLASS: Thanksgiving Holiday
November 30	<p>Derived rules and replacement rules</p> <ul style="list-style-type: none"> • Reading: ForallX 4.5-6 • In-class exercises: Proofs for derived rules, $T_1 - T_4$
December 2	<p>Review</p> <ul style="list-style-type: none"> • Homework due: Worksheet 2
December 9	Final Exam, in-class 7:00 – 9:00 PM

Grading Components and Weights:

Quiz (x 3) 50 points each: At the end of each section, there will be a short test on materials covered. Quizzes will occur during the second half of the class period. During the first half of the class, you will be able to review for the quiz with your group. **Prepares for SLOs 1, 2, 3, 4, and 5.**

Homework 100 points: There will be daily homework exercises. I will record your completion of homework exercises and you will be graded for completion. Homework must be submitted prior to the test that covers that material. **Attendance** will be factored into homework in the following way: +5 for 1 or fewer absences; -5 for 4 or more absences

Mid-term Exam 100 points: There will be an in-class mid-term exam on material covered in the first half of the course. The exam will cover translation of sentences into symbolic form, demonstration of an understanding of validity and soundness, and application of the truth table method to test for validity. **Assesses SLOs 1, 2, and 3.**

Final Exam 100 points: The final exam will be held on the officially scheduled exam date. The final exam will cover construction of proofs in sentential logic, translation of sentences into symbolic form, assessment of validity and soundness using truth tables, understanding of core logical vocabulary. **Assesses SLOs 4, and 5.**

NB: The final exam is cumulative and I will make the following promise to you: You will not receive a letter grade for this course any lower than the grade you receive

on the final exam. So, if your total average is lower than your final exam grade, then I will give you the final exam grade. Conversely, if your average is higher than your final exam grade, then I will give you your average grade.

Grading Policy:

All grades will be calculated according to a percentage of *total points*. The total number of points for this term is 525. The term grade legend follows:

A = 90% to 100% (405 to 450 point)	4 points per semester hour
B = 80% to 89.9% (360 to 404 points)	3 points per semester hour
C = 70% to 79.9% (315 to 359 points)	2 points per semester hour
D = 60% to 69.9% (270 to 314 points)	1 point per semester hour
F = 0% to 59.9% (000 to 269 points)	0 points per semester hour
FX (Failure due to non-attendance)	0 points per semester hour
IP (In Progress)	0 points per semester hour
W (Withdrawn)	0 points per semester hour
I (Incomplete)	0 points per semester hour
AUD (Audit)	0 points per semester hour

IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses.

FINAL GRADE OF FX: Students who stop attending class and do not withdraw themselves prior to the withdrawal deadline may either be dropped by their professor for excessive absences or be assigned the final grade of "FX" at the end of the semester. Students who stop attending classes will receive a grade of "FX", compared to an earned grade of "F" which is due to poor performance. Logging into a DE course without active participation is seen as non-attending. Please note that HCC will not disperse financial aid funding for students who have never attended class.

Students who receive financial aid but fail to attend class will be reported to the Department of Education and may have to pay back their aid. A grade of "FX" is treated exactly the same as a grade of "F" in terms of GPA, probation, suspension, and satisfactory academic progress.

To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades "IP," "COM" and "I" do not affect GPA.

Late policy:

Late work will be accepted with penalty, unless I have received a valid excuse or the student has arranged for late submission *prior to the deadline*. I will deduct a minimum of 10% of the grade from the first day the assignment is late and an additional 10% of the grade for every week it is late after that.

No assignments or quizzes will be accepted after the last day of instruction, December 2 2015. Any work submitted after that point cannot count toward your final grade without a legitimate legal or medical excuse. An incomplete will be given only in cases where a student has encountered a serious legal or medical issue that prevents them from complying with the above requirements.

!! Philosophy Tutoring is available at <http://hccs.askonline.net/> Please use it if you need it !!

Academic Honesty:

The pressure to earn high grades and belief that *a good end can justify any means whatsoever* leads many students to try cutting corners by resorting to less than honest methods. Do yourself a favor by avoiding that trap. The HCC *Student Handbook* lists cheating, plagiarism, and collusion as scholastic dishonesty. It defines *plagiarism* as "the appropriation of another's work and the unacknowledged incorporation of that work in one's own written work offered for credit." It defines *collusion* as "the unauthorized collaboration with another person in preparing work for credit." Work submitted for this course that is determined to be the result of either cheating, plagiarism, or collusion will earn a "0" for that assignment; two instances of cheating, plagiarism, or collusion will result in an automatic "F." *No exceptions and no re-writes.* Probation or dismissal from HCC and ALL its several colleges may also result. *See HCC Student Handbook.*

Make-up Policy:

Students are responsible for materials covered in-class and online during their absences, and it is the student's responsibility to contact and consult with the instructor for make-up assignments. In addition, any student who is absent on posted exam dates should be prepared to schedule the make-up of missed examinations on the first day of returning to class. Make-up examinations are taken by appointment at the campus Testing Center. This scheduling cannot occur during class time. Any other assignments not turned in on time (due to absences) must also be either turned in, or scheduled for late submission on the first day of returning to class. Finally, there will be no extension of due dates and/or make-ups for Online Requirements. Except for a medical excuse or documented family or personal emergency, there is no exemption from these rules.

Attendance and Withdrawal Policy:

HCC Students are expected to attend class regularly. A daily record of absences will be maintained throughout the semester. NOTE: It is the responsibility of the student to drop, or officially withdraw from this course. Your instructor will withdraw a student if and only if provided a written request from that student. Additionally, system-wide rules affect withdrawals:

- (1) Students who repeat a course for a third, or more times, may face a significant tuition/fee increase at HCC and other Texas public colleges and universities.
- (2) The Texas Legislature passed a law limiting new students (those starting college in Fall 2007) to no more than six total course withdrawals throughout their academic career in obtaining a baccalaureate degree. There may be future penalties imposed.
- (3) No student may withdraw from a course following the set "last date to withdraw", which for Fall 2015 is on **November 9 at 4:30 pm**. After that date and time, a student can only be given a grade earned, or an "I" for incomplete. Incompletes must be made up by the end of the following long semester, after which they will automatically change to a grade of "F". Students receiving an "I" for a course are ineligible for graduation until the "I" has been removed from a student's transcript.

Students with Disabilities:

To visit the ADA Web site, log on to www.hccs.edu, click Future students, scroll down the page and click on the words Disability Information.

For questions, please contact Donna Price at 713.718.5165 or the Disability Counselor at Central College, in the Learning Hub Science Building, room 106 (713-718-6164).

Student Services Policies:

<http://hccs.edu/student-rights>

EGLS3 – Evaluation for Greater Learning Student Survey System:

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time near the end of the term, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and department chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.