SPECIAL TOPICS
Texas A&M University
Core Curriculum Cover Sheet
Initial Request for a course to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): Philosophy

2. Course prefix and number: PHIL 240 3. Texas Common Course Number: 2303

4. Complete course title: Introduction to Logic 5. Semester credit hours: 3

6. This request is for consideration in the following Foundational Component Area:
   - [ ] Communication
   - [x] Mathematics
   - [ ] Life and Physical Sciences
   - [ ] Language, Philosophy and Culture
   - [ ] Creative Arts
   - [ ] American History
   - [ ] Government/Political Science
   - [ ] Social and Behavioral Sciences
   - CURRICULUM CORE: YES

7. This course should also be considered for International and Cultural Diversity (ICD) designation:
   - [ ] Yes  [x] No

8. How frequently will the class be offered? Every Fall and Spring

9. Number of class sections per semester: 20

10. Number of students per semester: 900


This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department submitting request should be in attendance when considered by the Core Curriculum Council.

13. Submitted by:
   - [ ] Course Instructor
   - [ ] Date: 29 May 2013

   Approvals:
   - [ ] Acting Head
   - [ ] Date: 29 May 2013

14. Department Head
   - [ ] Date: May 29, 2013

15. College Dean/Designee
   - [ ] Date

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Foundational Component Area: Mathematics

In the box below, describe how this course meets the Foundational Component Area description for Mathematics. Courses in this category focus on quantitative literacy in logic, patterns, and relationships. Courses involve the understanding of key mathematical concepts, and the application of appropriate quantitative tools to everyday experience.

The proposed course must contain all elements of the Foundational Component Area. How does the proposed course specifically address the Foundational Component Area definition above?

PHIL 240 (Introduction to Logic) focuses on quantitative literacy through the study of deductive and inductive arguments. It requires the mastery of Venn diagrams, truth tables, formal deductive systems, and the probability calculus, all of which contribute dramatically to quantitative literacy in logic, patterns, and relationships. Key mathematical concepts include validity, inference, deduction, Boolean logic, predicate logic, the probability calculus, and Bayes theorem. Logic improves everyday experience by enabling students to evaluate and manipulate data and to build and understand deductive and inductive arguments. These basic skills are useful to understanding modern computer systems, in succeeding on standardized tests, and in the everyday work of many professions including law, medicine, military, engineering, politics, business, marketing, journalism, environmental science, and social science.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective and how student learning of each objective will be evaluated.

The proposed course is required to contain each element of the Core Objective.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

PHIL 240 develops critical thinking through requiring students to evaluate arguments and to develop their own, in both cases using a variety of formal methods. Strategies used for developing critical thinking include readings, lectures, quizzes, classroom discussion, computerized tools in the logic lab and exams. Student learning is evaluated by means of quizzes and three exams.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):

PHIL 240 develops communication through requiring students to understand difficult concepts and to express those concepts themselves. Strategies used include texts, lectures, discussions, and computerized tools in the logic lab. Student learning is evaluated by means of quizzes and three exams.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

PHIL 240 develops empirical and quantitative skills through the manipulation of numerical data in the study of mathematical deductive arguments and in the study of probability and through the manipulation of observable facts in the evaluation of premises to deductive and inductive arguments. Strategies used include texts, lectures, discussions and computerized tools in the logic lab. Student learning is evaluated by means of quizzes and three exams.
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Core Curriculum

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Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.
Philosophy 240: Introduction to Logic — Syllabus
Sections 501-509, Fall Semester 2013

Instructor: Christopher Menzel
Email: cmenzel@tamu.edu
Office/Telephone: YMCA 428A/845-8764
Office hours: MW 1:45-2:45 and by appointment

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TBA...

Course Description
This course introduces students to techniques for evaluating both deductive and inductive arguments. Our study of deductive reasoning will consist in the development of three different logical systems: categorical logic, propositional logic, and predicate logic. Categorical logic (a.k.a. syllogistic logic) — which formed the basis of logic for two-thousand years — is the study of arguments whose constituent sentences express certain relations between classes (or categories) of things. Propositional logic (a.k.a. Boolean logic) is the study of arguments that depend on the number of important sentence-connecting expressions in ordinary language like and, or, and not — expressions whose logic also lies at the foundation of modern computer systems. Predicate logic (a.k.a. first-order logic) extends propositional logic to arguments that depend on the linguistic phenomena of predication (e.g., “Socrates is a philosopher”) and quantification (e.g., “All prime numbers except 2 are odd”). Predicate logic arose in the nineteenth century originally to aid in the clarification of mathematical arguments but has since extended its reach considerably into the fields of (notably) philosophy, linguistics, and artificial intelligence. To study these various logical systems, we develop in each case an appropriate formal language — a rigorously defined symbolic system — for representing a relevant class of natural language sentences. We then introduce a variety of mathematical methods for evaluating arguments that are formalized in the relevant formal language, notably, Venn diagrams (for categorical logic), truth tables (for propositional logic), and formal deductive systems (for both propositional and predicate logic).

In both inductive and deductive logic we are concerned with methods that enable us to distinguish good arguments from bad. What distinguishes the two is the standard of “goodness” involved. In deductive reasoning, the standard is very high — a good deductive argument is one where the conclusion must be true if the premises are. In a good inductive argument, by contrast, it need only be the case that the premises, if true, render the conclusion probable. In our study of inductive arguments, we will focus first on a number of common inductive argument forms found not only in the everyday reasoning one is likely to read in an editorial or hear in a discussion with friends, but in scientific reasoning as well, and we will identify properties of those forms that can render an inductive argument good or bad. Finally, we will focus upon the crucial notion of probability itself, a notion that is at the heart of scientific and statistical reasoning, as well as the modern philosophical discipline of formal epistemology. We will first identify the eight basic mathematical axioms, or rules, of the probability calculus. The probability calculus is a mathematical theory of probability that enables us to calculate the probabilities of complex propositions in terms of probabilities of their component parts. Then we will turn to the examination of a crucial consequence of the probability calculus known as Bayes’ Theorem. In addition to providing an equation for calculating complex probabilities that can be highly useful in applied situations like medical diagnosis, the theorem also provides an important insight into the relationship between the evidence for a hypothesis and the hypothesis itself and, hence, promises a deeper understanding of all types of inductive reasoning.
Learning Outcomes
At the end of the course, students will be able to:
1. Represent information in symbolic forms, notably the formal languages of categorical, propositional, and predicate logic.
2. Interpret and evaluate formalized arguments by means of formal semantic and deductive models, notably, Venn diagrams, truth tables, and formal deductive systems.
3. Calculate complex probabilities on the basis of the eight mathematical axioms of the probability calculus and Bayes' Theorem.
4. Identify and evaluate assumptions in both inductive and deductive reasoning as they appear in our daily experience.
5. Express an understanding of the fundamental concepts of deductive (categorical, propositional, and predicate) logic, inductive logic, and probability theory, including: formal language, Boolean operator, quantification, class, argument, validity, proof, probability, probability calculus, and Bayes' Theorem.

Course Format: Lectures and the Logic Lab
As described more fully on the course homepage, on Mondays and Wednesdays, I will lecture on the material in the book, and on either Thursday or Friday you will also attend a lab which will feature an online quiz. Note that the labs will all meet in YMCA 114. Lab time can also be used for getting help from the TA that will be leading the session.

Grading Policy
Exams are designed to test the student's mastery of the various logics and methods that will be studied in the course. Grades will be assigned on the basis of three exams — two midterms and a final exam — which will count toward a total of 75% of your final grade. Please bring a blue book to your exams unless instructed otherwise. 25% of your grade will be determined by the online quizzes given most every week in the lab. You must take the quiz in the lab for your assigned section in order to get credit! In fact, you will start with 50 out of 100 points on the quiz just for showing up and attempting it; and you are allowed to work freely with others. There will also be regular optional online extra credit problems (max 3 point bonus to be added to your overall score from tests and quizzes). Your total extra credit grade will be the ratio (relative to 3) of the points you gain by correctly answering problems to the total number of extra credit "base" points offered. (Thus, if there are, say, 30 total base points by the end of the semester and you are awarded a total of 15 points, your extra credit score will be (15/30) * 3 = 1.5.) Hence, every time you skip an online extra credit offering, your extra credit points for the semester go down. You are allowed to work with others on the extra online extra credit quizzes.

Lecture and Exam Schedule
...can be found [here].
All exams are taken in our lecture hall ZACH 102 at the usual class time.

Course Text (required)

Obligatory Academic Honesty Thingy
Academic dishonesty includes cheating in all its forms and is utterly inconsistent with the Aggie Honor Code: "An Aggie does not lie, cheat or steal, or tolerate those who do.''. Under Texas A&M's policies, students guilty of academic dishonesty may receive lowered grades and other more severe penalties. For further details, consult the website for the Aggie Honor System Office. Note that academic dishonesty includes not only getting someone else to do your work (with or without their knowledge) but also knowingly doing someone else's work for them. This applies to take-home assignments as much as to in-class work. Please note that I take the Aggie Honor Code very seriously and expect strict adherence to it.

Americans with Disabilities Act (ADA) Policy Statement
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation
requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu.

Additional Info

- **Exams**
  - All exams are in Zachry 102.
  - Midterm dates will be confirmed with at least 7 days notice.
  - With few exceptions, make-up exams will be provided only in cases of university sanctioned absences, notably, illness, family emergencies, and authorized university activities. In any case, written documentation is required. In the case of illness, a written note from a doctor is required. The note must be on the doctor's official stationery and must include full contact information. If you need to make up an exam, arrange a time to do so with your TA and be sure to bring your documentation with you to the make-up to give to the TA; you will not be permitted to make up your exam without it. **NB: Exams must be made up by the end of the week following the day of the scheduled exam unless circumstances do not permit it. In such cases, your instructor must be notified as soon as circumstances permit to discuss your situation.**
  - When blue books are required (usually for the second and third exams) you must bring your own. You may also bring a couple of clean sheets of paper for scratch work.

- **Quizzes and Extra Credit**
  - Once again, weekly online lab quizzes can only be taken in the labs during your assigned lab period. We can tell if you try to take a quiz from outside your assigned lab, so please don't try to skip the lab and do the quiz from somewhere else. Attempts to do so will be treated as academic dishonesty.
  - Lab quizzes can be made up with a legitimate excuse. **Quizzes must be made up within one week unless circumstances do not permit it. The procedure and requirements for making up a quiz are identical to those for making up an exam (see above).**
  - There will be no extra credit opportunities other than the regular online extra credit quizzes.
  - There will be no make-up assignments for extra credit. Each assignment will be on the web for several days, so you should have plenty of time to complete them.
  - Students using email, browsing web sites unrelated to the course, or using instant messaging during lab will be given a 0 for that lab.

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http://philebus.tamu.edu/phl/2400/yl/lab06.html
Last updated Thu 24 Jan 2013