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Chapter 1 : Logic - Wikipedia

But An Introduction to Formal Logic shows that the symbols convey simple ideas compactly and become second nature with use. In case after case, Professor Gimbel explains how to analyze an ambiguous sentence in English into its component propositions, expressed in symbols.

General Orientation This course is an introduction to deductive formal logic with at least some informative pointers to inductive formal logic. After this class, the student can proceed to the intermediate level in formal deductive logic, and “ with a deeper understanding and better prepared to flourish “ to various areas within the formal sciences, which are all based on formal logic. The formal sciences include e. In general, formal logic is the science and engineering of reasoning, 1 but even this supremely general description fails to convey the flexibility and enormity of the field. For example, all of classical mathematics can be deductively derived from a small set of formulas e. Logic is indeed the foundation for all at once rational-and-rigorous intellectual pursuits. If you can find a counter-example, i. A Research University You have wisely decided to attend a technical research university, with a faculty-led mission to create new knowledge and technology in collaboration with students. RPI is the oldest such place in the English-speaking world; it may know a thing or two about this mission. The mission drives those who teach you in this class. The last thing we want to do is simply convey to you how others present and teach introductory formal logic. As should be obvious by now, we think we have invented a better way to define, specify, and present formal logic, and are working hard to explain this invention, to explain it to others, and to disseminate the invention in question. Please note that guest lecturers other than A Bringsjord should not be assumed to have fully affirmed the LAMA paradigm. This thus applies specifically to TA Rini Palamittam. As to what these thinkers hold in connection with LAMA, that is an open question. You are free to inquire. Her email address is palamr rpi. Please note again A Disclaimer!. Prerequisites There are no formal prerequisites. However, as said above, this course covers formal logic. This implies that “ for want of a better phrase “ students are expected to have a degree of logico-mathematical maturity. You have this on the assumption that you understood the math you were supposed to learn to make it where you are. An example of the list of concepts and techniques you are assumed to be familiar with from high-school geometry can be found in the common-core-connected Geometry: Common Core by Bass et al. An example of the list of concepts and techniques you are assumed to be familiar with from high-school Algebra 2 can be found in the common-core-connected Algebra 2: Common Core by Bellman et al. Full logistics of the purchase, and the contents of the CD that holds this pair and other files , will be explained the first class and subsequently, as needed. Updates to LAMA-BDL, and additional exercises, will be provided by listing on the course web page and sometimes by email through the course of the semester. You will need to manage many electronic files in the course of this course, and e-housekeeping and e-orderliness is of paramount importance. Please note that Slate is copyrighted software: You will need to submit via hard copy in person, or email to Bringsjord a signed hard-copy version of a Software License Agreement a pdf is included on the aforementioned CD. This agreement will also cover the textbook, which is copyrighted as well, and cannot be copied or distributed. In addition, occasionally papers may be assigned as reading. Two, indeed, were assigned in the syllabus, on the first day of class. Finally, slide decks used in class will contain crucial additional content above and beyond LAMA-BDL and Slate, and will be available on the web site for course. The readings here are partitioned into two categories: Syllabi The syllabus for Spring is available here. You can find the Spring syllabus, as a pdf, here. The Spring version of the syllabus, as a pdf, is available here. Slide Decks with associated files; e. The syllabus was projected and presented. S Bringsjord January 22

Chapter 2 : Introduction: Formal Logic | The Critical Thinker Academy

An Introduction to Formal Logic. Logic is the key to philosophy, mathematics, and science. Learn logic from an award-winning professor of philosophy.

Modal logic In languages, modality deals with the phenomenon that sub-parts of a sentence may have their semantics modified by special verbs or modal particles. For example, "We go to the games" can be modified to give "We should go to the games", and "We can go to the games" and perhaps "We will go to the games". More abstractly, we might say that modality affects the circumstances in which we take an assertion to be satisfied. Confusing modality is known as the modal fallacy. His work unleashed a torrent of new work on the topic, expanding the kinds of modality treated to include deontic logic and epistemic logic. The seminal work of Arthur Prior applied the same formal language to treat temporal logic and paved the way for the marriage of the two subjects. Saul Kripke discovered contemporaneously with rivals his theory of frame semantics, which revolutionized the formal technology available to modal logicians and gave a new graph-theoretic way of looking at modality that has driven many applications in computational linguistics and computer science, such as dynamic logic. Informal reasoning and dialectic[edit] Main articles: Informal logic and Logic and dialectic The motivation for the study of logic in ancient times was clear: This ancient motivation is still alive, although it no longer takes centre stage in the picture of logic; typically dialectical logic forms the heart of a course in critical thinking, a compulsory course at many universities. Dialectic has been linked to logic since ancient times, but it has not been until recent decades that European and American logicians have attempted to provide mathematical foundations for logic and dialectic by formalising dialectical logic. Dialectical logic is also the name given to the special treatment of dialectic in Hegelian and Marxist thought. There have been pre-formal treatises on argument and dialectic, from authors such as Stephen Toulmin *The Uses of Argument*, Nicholas Rescher *Dialectics*, [32] [33] [34] and van Eemeren and Grootendorst *Pragma-dialectics*. Theories of defeasible reasoning can provide a foundation for the formalisation of dialectical logic and dialectic itself can be formalised as moves in a game, where an advocate for the truth of a proposition and an opponent argue. Such games can provide a formal game semantics for many logics. Argumentation theory is the study and research of informal logic, fallacies, and critical questions as they relate to every day and practical situations. Specific types of dialogue can be analyzed and questioned to reveal premises, conclusions, and fallacies. Argumentation theory is now applied in artificial intelligence and law. Mathematical logic Mathematical logic comprises two distinct areas of research: Mathematical theories were supposed to be logical tautologies, and the programme was to show this by means of a reduction of mathematics to logic. If proof theory and model theory have been the foundation of mathematical logic, they have been but two of the four pillars of the subject. Recursion theory captures the idea of computation in logical and arithmetic terms; its most classical achievements are the undecidability of the Entscheidungsproblem by Alan Turing, and his presentation of the Church-Turing thesis. Most philosophers assume that the bulk of everyday reasoning can be captured in logic if a method or methods to translate ordinary language into that logic can be found. Philosophical logic is essentially a continuation of the traditional discipline called "logic" before the invention of mathematical logic. Philosophical logic has a much greater concern with the connection between natural language and logic. As a result, philosophical logicians have contributed a great deal to the development of non-standard logics e. Logic and the philosophy of language are closely related. Philosophy of language has to do with the study of how our language engages and interacts with our thinking. Logic has an immediate impact on other areas of study. Studying logic and the relationship between logic and ordinary speech can help a person better structure his own arguments and critique the arguments of others. Many popular arguments are filled with errors because so many people are untrained in logic and unaware of how to formulate an argument correctly. Computational logic and Logic in computer science A simple toggling circuit is expressed using a logic gate and a synchronous register. Logic cut to the heart of computer science as it emerged as a discipline: The

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notion of the general purpose computer that came from this work was of fundamental importance to the designers of the computer machinery in the s. In the s and s, researchers predicted that when human knowledge could be expressed using logic with mathematical notation , it would be possible to create a machine that reasons, or artificial intelligence. This was more difficult than expected because of the complexity of human reasoning. In logic programming , a program consists of a set of axioms and rules. Logic programming systems such as Prolog compute the consequences of the axioms and rules in order to answer a query. Today, logic is extensively applied in the fields of artificial intelligence and computer science , and these fields provide a rich source of problems in formal and informal logic. Argumentation theory is one good example of how logic is being applied to artificial intelligence. Boolean logic as fundamental to computer hardware:

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Chapter 3 : NEW! An Introduction to Formal Logic by Great Courses | eBay

But beyond these very practical benefits, informal logic—the kind we apply in daily life—is the gateway to an elegant and fascinating branch of philosophy known as formal logic, which is philosophy's equivalent to calculus.

It dates back to the times of Aristotle; it has been studied through the centuries; and it is still a subject of active investigation today. This course is a basic introduction to Logic. It shows how to formalize information in form of logical sentences. It shows how to reason systematically with this information to produce all logical conclusions and only logical conclusions. And it examines logic technology and its applications - in mathematics, science, engineering, business, law, and so forth. The course differs from other introductory courses in Logic in two important ways. First of all, it teaches a novel theory of logic that improves accessibility while preserving rigor. Second, the material is laced with interactive demonstrations and exercises that suggest the many practical applications of the field. Course Details online session This course covered formalized information and systematic reasoning through logical sentences. Additionally, it examined logic technology and its applications through interactive demonstrations and exercises. April 23, online session This course is a rigorous introduction to Logic. It covers the encoding of information as logical sentences, logical reasoning, and an introduction to logic technology and its applications. September 24, online session This course is a rigorous introduction to Logic. April 01, online session This course is a rigorous introduction to Logic. Logics covered include Propositional Logic and Relational Logic. September 30, online session This course is a rigorous introduction to Logic. September 29, online session This course is a rigorous introduction to Logic. Students who successfully complete the class will receive a statement of accomplishment signed by the instructor. What is the format of the class? The class consists of videos, notes, and a few background readings. The videos include interactive demonstrations and exercises. There are also standalone quizzes that are not part of video lectures. What should I know to take this class? The course has no prerequisites beyond high school mathematics. You should be comfortable with symbolic manipulation techniques, as used, for example, in solving simple algebra problems. And you need to understand sets, functions, and relations. If you have this background, you should be fine. Do I need to buy any textbooks? None is required, as the course is self-contained. He received his Sc. He is best known for his research on Computational Logic and its many applications including General Game Playing.

Chapter 4 : Introduction to (Formal) Logic

Award-winning Professor of Philosophy Steven Gimbel of Gettysburg College guides you with wit and charm through the full scope of this immensely rewarding subject in An Introduction to Formal.

Logic is the art of reasoning well. Christian apologist and author C. Lewis believed in using logic as an aid in determining truth. Lewis uses this scene to make an important point about logical thinking. The professor rationally explores the alternative explanations through simple abductive reasoning and concludes that they are unlikely. There are only three possibilities. Either your sister is telling lies, or she is mad, or she is telling the truth. For the moment then and unless any further evidence turns up, we must assume that she is telling the truth. The laws of logic are a reflection of the mind of God, just as moral law is a reflection of His character. As a former atheist, Lewis offered in the book *Mere Christianity* a number of reasonable, logical arguments in support of his conversion to Christianity. While doing so, he was following the example of the role that reason played in the scriptures. Logical thinking is featured prominently in the Bible. In Acts 26, Paul uses logic to make his case for Christianity. Logically, Paul believes the Christian message because of the evidence, both experiential his encounter with Christ and evidential the testimony of witnesses. In 1 Peter 3: Again, he is not asking for blind faith, but faith founded on logic. Although it is true that logic studied as a formal discipline can lead to challenging formulas and diagrams, in a basic sense we all use logic every day to get through some of the simplest decisions and actions in life. In reading this article, for example, you are using logic to interpret the words you see. Without logic, you could not make sense of this sentence. Interpreting a rational sentence requires a rational mind with the ability to comprehend words that are structured in a way that makes sense “in short, words that are organized logically. Logic is a fundamental part of classical education, but no matter what homeschooling method you use, logic can help you to excel in every subject you study. Studying logic will also help improve your SAT score, since the SAT at its core is a test of reasoning, not a test of knowledge. Here are two self-paced courses that are perfect for homeschooling teens: Traditional Logic I is used for the first semester, continuing with Traditional Logic II by the same author for the second semester. If you only take one logic class in high school, it should be Traditional Logic I. But the two books together constitute a complete curriculum in formal logic at the junior and senior high school levels. They are both Christian-based and published by Memoria Press. Traditional Logic I, Student Text is an in-depth study of the classical syllogism designed for use as young as 7th grade. Along with a basic understanding of the Christian theory of knowledge, the text presents the four kinds of logical statements, the four ways propositions can be opposed, the three ways in which they can be equivalent, and the seven rules for the validity of syllogisms. This comprehensive but easy to use course can be used as a one-semester course. However, it actually can be completed in less than a semester, which will allow extra time to spend on the more difficult material in Book II. Traditional Logic II, Student Text covers the four figures of the traditional syllogism, the three forms of rhetorical arguments called enthymemes, the three kinds of hypothetical syllogisms, the four kinds of complex syllogisms, as well as relational arguments. Augustine and Tertullian, as well as extended case studies of famous arguments from throughout history. It could be used as the basis for a year-long rather than a one-semester course. Cothran teaches directly to the student and covers each lesson from the textbooks while explaining important concepts and illustrating key points as well as the difficult exercises with plenty of on-screen graphics. Flawed, misleading, and false arguments are everywhere. From advertisers trying to separate you from your money, to politicians trying to sway your vote, to friends who want you to agree with them, many people try to sway your thinking and influence your belief structure. Logic is intellectual self-defense against such assaults on reason and also a method of quality control for checking the validity of your own views. Formal logic is a breathtakingly versatile tool. Much like a Swiss army knife for the incisive mind, it is a powerful mode of inquiry that can lead to surprising and worldview-shifting conclusions. Steven Gimbel guides you with wit and charm through the full scope of this immensely rewarding subject in An

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Introduction to Formal Logic, 24 engaging half-hour lectures that teach you logic from the ground up—from the fallacies of everyday thinking to cutting edge ideas on the frontiers of the discipline. Packed with real-world examples and thought-provoking exercises, this course is suitable for everyone from beginners to veteran logicians. Plentiful on-screen graphics, together with abundant explanations of symbols and proofs, make the concepts crystal clear. Please note that the above product was NOT provided for free or at a discount in exchange for a review. This item was purchased by a homeschooling family at their own expense. What types of activities and courses have you used as electives? Leave a comment and we may include yours in a future column!

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Formal logic is intellectual self-defense and the key to clear thinking, good planning, and sound reasoning. Learn the principles in 24 lucid lectures taught by a professor who practices what he teaches.

Chapter 7 : Traditional Logic I Complete Set | Memoria Press - Classical Curriculum

Formal symbolic deductive logic: Known as "formal" logic because it focuses on the form of arguments, this family of techniques uses symbolic language to assess the validity of a wide range of deductive arguments, which infer particulars from general laws or principles.

Chapter 8 : Logic < University of California, Berkeley

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Chapter 9 : An Introduction to Formal Logic

The Great Courses: An Introduction to Formal Logic Many homeschoolers use secular courses from The Teaching Company, including this one taught by award-winning Professor Steven Gimbel of Gettysburg College in Pennsylvania, where he serves as Chair of the Philosophy Department.