

Chapter 1 : Untitled Document

wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims.

A declarative sentence that we can treat as either true or false. The telephone in Dr. Tiger Woods can hit a golf ball farther on the moon than on earth. Questions and commands are not claims. Claims can be explicit or implicit. The main claim of a piece of writing or speech is often implicit. It is difficult to determine the truth of a claim if it is unclear in any way. For instance, pronouns can make it unclear about who the claim is about. Patricia and Jennifer went to the store for some fruit. She likes oranges and grapes. In this case, it is not clear who "she" is and we cannot tell what claim is being made. The claim should have been made using a proper name.

Contradiction A contradiction is any situation where we have two claims that cannot be true at the same time. One claim is the contradictory of another if its truth shows that the other is false. The contradictory of a conditional claim is the true description of any example where the antecedent is true but the consequent is false. Such a case is called a counterexample. One contradictory of "If you go to college then you will earn lots of money" is "My uncle went to college and then became a priest who lived according to a vow of poverty. The contradictory of a universal claim is also any description of a counterexample. The contradictory of a disjunction will be the information that none of the disjuncts the choices is true. This is most easily presented by naming an additional choice which, if selected, will mean that the specified choices are false.

Controlled Study To establish a correlation for a causal argument, the argument needs two different samples: Sometimes we deal with an issue in which it is impossible to totally exclude the cause from the control group. Here, we have a group where the cause is present in higher amounts the experimental group and lower amounts the control group. For example, we want to know if smoking is a cause of breast cancer. Since even people who do not smoke are sometimes exposed to quite a lot of second-hand smoke, we have to determine how much exposure to cigarette smoke there has been, and then put people into the high exposure and low exposure groups. The low exposure group is our control group. Or we can simply use the cancer rate in the general population and compare it to a sample with high exposure unless everyone has very high exposure, the general population will have a lower rate of the cause than our experimental group. When the researcher introduces the cause into the sample and withholds it from the second sample, thus creating the experimental and control groups, we have a controlled design. This is also known as a randomized experimental design or, more simply, an experiment. The obvious advantage is that the researcher can control other variables that might affect the outcome. It is much less likely to result in a causal fallacy. An uncontrolled design is used when the researcher cannot run a randomized experimental design it might be illegal or immoral or just not very practical. In that case, the researcher has to go and find existing cases for the experimental group, and find similar cases where the suspected cause is absent or found at lower rates the control group. This is also known as a prospective design the researcher goes "prospecting" for the cause or it is simply known as a study. Uncontrolled design is subject to more fallacies than controlled design, particularly the fallacies of reversing cause and effect, of overlooking a common cause, and of Post Hoc. Sometimes the same group is used for both the control and experimental group, by comparing how things were before an event and then again after. To argue that the September 11 terrorist attacks on the World Trade Center in New York caused insomnia in Americans, we could compare insomnia rates in the months before and after the attack. Yes, there are researchers who track these rates. Of course, in this case it is an uncontrolled study and we would have to look for the possible causal fallacies.

Correlation A correlation is a measurable relationship between two variables. A correlation can be either positive or negative. Combined with enough other information, correlations play an important role in determining whether one thing is a cause of another. A variable is an identifiable, changing feature of the world. For example, air temperature and humidity are two different variables that affect how hot or cold we feel. Many variables are present or absent to some measurable degree. If we suspect that something is a variable that has an influence on something else, we will often miss its true significance if we treat it as an "all or none thing. Different smokers smoke in different amounts, and most non-smokers inhale some tobacco

smoke sometimes. If neither variable allows for degrees, a positive correlation is present when one outcome for the first variable is associated with one outcome for the second variable. For example, being pregnant is positively correlated with being female. However, it does not have to be perfect match! Being a student enrolled at MSUM is positively correlated with being female. For example, being male is positively correlated with violent behavior. Being an American citizen is positively correlated with fossil-fuel consumption. If both variables allow for degrees, a positive correlation is present when an increase in one outcome for the first variable is associated with an increase in the presence of a particular outcome for the second variable. For example, literacy is positively correlated with education. Human population density is positively correlated with distance from an ocean. The positive association can be an overall pattern that does not necessarily occur in all cases. The higher the drop point, the higher the force of impact. Some objects dropped from a height might have parachutes attached to them, so their impact might be more like that of an object dropped from a much lower height. Again, the association can be an overall pattern that does not necessarily occur in all cases. A small number of Ph. Regular flossing of your teeth is negatively correlated with gum disease. There is NO correlation when there are no regular patterns of increase and decrease for pairings of the two variables. Although the number of panda bears living in zoos has steadily increased every year for the past decade, sales by the Igloo Ice Company have gone up and down from year to year over the same period. Although one might ASSUME that "common sense" can tell what variable will be correlated with which other variables, there are often surprises. Many people believe that women talk more than men that being female is positively correlated with verbosity, but recent studies in several countries reveal no differences in average number of words spoken by men and women on a daily basis. Or, to take another interesting example, one might think that being a member of a church that opposes abortion would be negatively correlated with having abortions. The Roman Catholic church is officially against the practice of abortion. So being Roman Catholic is positively correlated with abortion in the U. There is a negative correlation between being a Protestant and receiving an abortion. However, here is also a negative correlation between being married and receiving an abortion, and it is a much stronger correlation than the negative correlation between being Protestant and abortion. Critical Thinking In response to claims of any kind, a critical thinker demands adequate evidence before accepting or acting on a claim. Essentially, critical thinking is an evaluative stance. The primary characteristics of someone engaged in critical thinking are curiosity, a questioning attitude, a demand for evidence, and suspicion of extreme positions. Deductive Argument An argument that attempts to guarantee the truth of its conclusion. Notice that this classification depends on what the arguer intends to do, not on whether the argument succeeds in doing it! By "guarantee," we mean that the premises show that the conclusion must be true. An argument that meets this high standard is said to be valid. Most of the time, the fallacy consists of extrapolating too quickly. For instance, it happens when a small preliminary study suggests a correlation and thus cause, but the correlation vanishes when we try to replicate the study. Other times, it is the fallacy of putting too much trust in a sample that, due to no other fallacy, fails to represent the general picture. How does this happen? To learn more, click here. Conclusion The claim that an argument tries to establish as true; what the arguer is trying to prove to the audience. Conditional Claim A claim that says that the truth of one claim depends on the truth of another, or that the situation described in one claim depends on the situation described in the other. For example, the claim "If cows are mammals then cows give milk" is claiming that cows giving milk depends on cows being mammals. When most clearly expressed, conditionals take the form "If A then B. The claim in position B is called the consequent. The antecedent is "cows are mammals" and the consequent is "cows give milk. But there are many other ways to express a conditional claim besides the form "If A then B. Denying the antecedent The invalid argument pattern in which the second premise disagrees with the antecedent of a conditional. This pattern is fallacious always unsound!

Chapter 2 : Analyzing arguments/ Evaluating arguments and truth claims by cecilia Tavena on Prezi

The content of an argument is what the argument is about, and this is based on what the sentences that constitute the argument are about. The primary measure of content quality is truth value. The primary measure of content quality is truth value.

Validity and Soundness When we evaluate arguments, we begin by evaluating the inferential claim, then move to the factual claim. Validity and Soundness apply to deductive arguments. A valid deductive argument is an argument such that it is impossible for the premises to be true and the conclusion false. The conclusion follows with strict necessity from the premises. On the other hand, an invalid deductive argument is a deductive argument such that it is possible for the premises to be true and the conclusion false. The conclusion does not follow with strict necessity from the premises. Note that there is no middle ground--an argument cannot be "almost" valid. To test an argument for validity, we begin by assuming that the premises are true. Assuming they are true, is it possible for the conclusion to be false? All television networks are media companies. NBC is a television network. Therefore, NBC is a media company. Imagine that the premises are true and they are , and then ask: Not in this case. All automakers are computer manufacturers. United Airlines is an automaker. Therefore, United Airlines is a computer manufacturer. Again, imagine that the premises are true they are not , and then ask: Again, not in this case, even though the premises themselves are false. The truth or falsity of the individual premises has nothing to do with the validity of the argument. It is valid or invalid regardless of the truth value of its premises. In a valid argument, we say that if the premises are true, then the conclusion must be true. All banks are financial institutions. Smith-Barney is a financial institution. Therefore, Smith-Barney is a bank. True premises, false conclusion. This argument form is invalid. The relationship between the premises and conclusion determines validity. A sound argument is a valid argument with true premises. Notice that, by definition, a sound argument will have a true conclusion as well. An unsound argument is a deductive argument that is invalid, has one or more false premises, or both. Strength and Cogency Strength and Cogency apply to inductive arguments. A strong inductive argument is an inductive argument such that it is improbable that the premises be true and the conclusion false. A weak inductive argument, on the other hand, is one in which the conclusion probably does not follow from the premises. Again, assume that the premises are true, and then we determine whether, based on that assumption, the conclusion is probably true. All crows we have seen to date are black. Therefore, probably the next crow we see will be black. All meteorites found to this day have contained sugar. Therefore, probably the next meteorite found will contain sugar. The first argument, though, is cogent while the second is uncogent. A strong inductive argument with all true premises. During the past fifty years, inflation has consistently reduced the value of the American Dollar. Therefore, industrial productivity will probably increase in the years ahead. Both of these may well be true, but the premise provides no evidence for the conclusion. Again, the strength of an argument is simply the degree to which the premises, when assumed true, support the conclusion. For both inductive and deductive arguments, the only arrangement of truth and falsity relevant to validity or soundness is when we have true premises and a false conclusion.

Chapter 3 : TRUTH ARGUMENTS

Analyzing arguments/ Evaluating arguments and truth claims Summarizing Longer argument's Providing a synopsis of the argument that accurately restates the main points in the summarizer's own words.

Etymology[edit] The Latin root *arguere* to make bright, enlighten, make known, prove, etc. Informal logic and Formal logic Informal arguments as studied in informal logic, are presented in ordinary language and are intended for everyday discourse. Conversely, formal arguments are studied in formal logic historically called symbolic logic, more commonly referred to as mathematical logic today and are expressed in a formal language. Informal logic may be said to emphasize the study of argumentation, whereas formal logic emphasizes implication and inference. Informal arguments are sometimes implicit. That is, the rational structure "the relationship of claims, premises, warrants, relations of implication, and conclusion" is not always spelled out and immediately visible and must sometimes be made explicit by analysis. Standard types[edit] Argument terminology There are several kinds of arguments in logic, the best-known of which are "deductive" and "inductive. Each premise and the conclusion are truth bearers or "truth-candidates", each capable of being either true or false but not both. These truth values bear on the terminology used with arguments. Deductive arguments[edit] A deductive argument asserts that the truth of the conclusion is a logical consequence of the premises. Based on the premises, the conclusion follows necessarily with certainty. Deductive arguments are sometimes referred to as "truth-preserving" arguments. A deductive argument is said to be valid or invalid. If one assumes the premises to be true ignoring their actual truth values, would the conclusion follow with certainty? If yes, the argument is valid. Otherwise, it is invalid. In determining validity, the structure of the argument is essential to the determination, not the actual truth values. If we assume the premises are true, the conclusion follows necessarily, and thus it is a valid argument. If a deductive argument is valid and its premises are all true, then it is also referred to as sound. Otherwise, it is unsound, as in the "bats are birds" example. Inductive arguments[edit] An inductive argument, on the other hand, asserts that the truth of the conclusion is supported to some degree of probability by the premises. For example, given that the U. Arguments that involve predictions are inductive, as the future is uncertain. An inductive argument is said to be strong or weak. If the premises of an inductive argument are assumed true, is it probable the conclusion is also true? If so, the argument is strong. Otherwise, it is weak. A strong argument is said to be cogent if it has all true premises. Otherwise, the argument is uncogent. The military budget argument example above is a strong, cogent argument. Deductive argument A deductive argument is one that, if valid, has a conclusion that is entailed by its premises. In other words, the truth of the conclusion is a logical consequence of the premises "if the premises are true, then the conclusion must be true. It would be self-contradictory to assert the premises and deny the conclusion, because the negation of the conclusion is contradictory to the truth of the premises. Validity logic Deductive arguments may be either valid or invalid. If an argument is valid, it is a valid deduction, and if its premises are true, the conclusion must be true: An argument is formally valid if and only if the denial of the conclusion is incompatible with accepting all the premises. The validity of an argument depends, however, not on the actual truth or falsity of its premises and conclusion, but solely on whether or not the argument has a valid logical form. The validity of an argument is not a guarantee of the truth of its conclusion. Under a given interpretation, a valid argument may have false premises that render it inconclusive: Logic seeks to discover the valid forms, the forms that make arguments valid. A form of argument is valid if and only if the conclusion is true under all interpretations of that argument in which the premises are true. Since the validity of an argument depends solely on its form, an argument can be shown to be invalid by showing that its form is invalid. This can be done by giving a counter example of the same form of argument with premises that are true under a given interpretation, but a conclusion that is false under that interpretation. In informal logic this is called a counter argument. The form of argument can be shown by the use of symbols. For each argument form, there is a corresponding statement form, called a corresponding conditional, and an argument form is valid if and only if its corresponding conditional is a logical truth. A statement form which is logically true is also said to be a valid statement form. A statement form is a logical

truth if it is true under all interpretations. A statement form can be shown to be a logical truth by either a showing that it is a tautology or b by means of a proof procedure. The corresponding conditional of a valid argument is a necessary truth true in all possible worlds and so the conclusion necessarily follows from the premises, or follows of logical necessity. The conclusion of a valid argument is not necessarily true, it depends on whether the premises are true. If the conclusion, itself, just so happens to be a necessary truth, it is so without regard to the premises. All Greeks are human and all humans are mortal; therefore, all Greeks are mortal. Valid argument; if the premises are true the conclusion must be true. Some Greeks are logicians and some logicians are tiresome; therefore, some Greeks are tiresome. Either we are all doomed or we are all saved; we are not all saved; therefore, we are all doomed. Valid argument; the premises entail the conclusion. This does not mean the conclusion has to be true; it is only true if the premises are true, which they may not be! Some men are hawkers. Some hawkers are rich. Therefore, some men are rich. This can be easier seen by giving a counter-example with the same argument form: Some people are herbivores. Some herbivores are zebras. Therefore, some people are zebras. Invalid argument, as it is possible that the premises be true and the conclusion false. In the above second to last case Some men are hawkers See also, existential import. The forms of argument that render deductions valid are well-established, however some invalid arguments can also be persuasive depending on their construction inductive arguments , for example. See also, formal fallacy and informal fallacy. Inductive argument Non-deductive logic is reasoning using arguments in which the premises support the conclusion but do not entail it. Forms of non-deductive logic include the statistical syllogism , which argues from generalizations true for the most part, and induction , a form of reasoning that makes generalizations based on individual instances. The lack of deductive validity is known as the problem of induction. Defeasible arguments and argumentation schemes[edit] In modern argumentation theories, arguments are regarded as defeasible passages from premises to a conclusion. Defeasibility means that when additional information new evidence or contrary arguments is provided, the premises may be no longer lead to the conclusion non-monotonic reasoning. This type of reasoning is referred to as defeasible reasoning. For instance we consider the famous Tweedy example: Tweedy is a bird. Therefore, Tweedy probably flies. This argument is reasonable and the premises support the conclusion unless additional information indicating that the case is an exception comes in. If Tweedy is a penguin, the inference is no longer justified by the premise. Defeasible arguments are based on generalizations that hold only in the majority of cases, but are subject to exceptions and defaults. In order to represent and assess defeasible reasoning, it is necessary to combine the logical rules governing the acceptance of a conclusion based on the acceptance of its premises with rules of material inference, governing how a premise can support a given conclusion whether it is reasonable or not to draw a specific conclusion from a specific description of a state of affairs. Argumentation schemes have been developed to describe and assess the acceptability or the fallaciousness of defeasible arguments. Argumentation schemes are stereotypical patterns of inference, combining semantic-ontological relations with types of reasoning and logical axioms and representing the abstract structure of the most common types of natural arguments. However, the two levels of abstraction are not distinguished. A typical example is the argument from expert opinion, which has two premises and a conclusion. Source E is an expert in subject domain S containing proposition A. E asserts that proposition A is true false. A is true false. Each scheme is associated to a set of critical questions, namely criteria for assessing dialectically the reasonableness and acceptability of an argument. The matching critical questions are the standard ways of casting the argument into doubt. How credible is E as an expert source? Is E an expert in the field that A is in? What did E assert that implies A? Is E personally reliable as a source? Is A consistent with what other experts assert? If an expert says that a proposition is true, this provides a reason for tentatively accepting it, in the absence of stronger reasons to doubt it. But suppose that evidence of financial gain suggests that the expert is biased, for example by evidence showing that he will gain financially from his claim.

Chapter 4 : English & Assessing Evidence

Logical Arguments an argument can be defined as a: form of reasoning that attempts to establish the truth of one claim (called a conclusion) based on the assumed truth of the evidence in other claims (called premises).

This rather simple way of stating their position, of course, does not do justice to the sophisticated way that evidentialist scholars have developed a philosophy of fact to undergird the apologetic task. In this chapter, then, we shall consider in some detail the evidentialist system of apologetics in order to come to terms with the distinctive way it responds to the challenges facing the Christian apologist. Methods for Discovering Truth Evidentialism in Christian apologetics seeks to show the truth of Christianity by demonstrating its factuality. Whereas classical apologetics characteristically regards logic or reason as the primary criterion of truth, evidentialism characteristically assigns this priority to fact. This difference can be understood largely a matter of emphasis; of course, both classical apologists and evidentialists consider reason and fact to be both essential to apologetic argumentation. Second, it establishes what we might call an epistemology of suspicion: But why should the burden of proof be placed on a belief rather than on its denial? If I believe that the world exists as a reality independent of my senses, I am perfectly right to adhere to this belief in the absence of reasons or evidence to the contrary. If we were to formulate a maxim for evidentialist apologetics, it would be something like this: In other words, evidentialism in apologetics places a certain burden of proof on the apologist to show non-Christians why it is rational to believe in Christ. At the same time, evidentialists claim that the truth of the Christian message cannot be successfully or properly denied without a fair consideration of the factual basis for the Christian truth claim. Henceforth when we refer to evidentialism, we are referring to the apologetic approach. Although apologetical evidentialists generally do not subscribe to epistemological evidentialism, they sometimes do argue that people ought to have evidence or reasons for the beliefs they hold in matters of supreme importance. Priority of Fact and Induction Although there are different varieties of evidentialist apologetics, they have several crucial aspects in common. First, evidentialism is primarily inductive, rather than deductive, in its logical form. Inductive arguments reason from as many facts, or data, as can be mustered to a conclusion that is shown to be supported in some way by the facts. By contrast, deductive arguments, such as those favored in classical apologetics, reason from as few facts, or premises, as are needed to a conclusion that is shown to follow from the facts. Evidentialism makes induction, rather than deduction, the primary form of apologetic argumentation. Even John Warwick Montgomery, whose advocacy of empirical method is more thoroughgoing than perhaps any other noted evidentialist, denies that all knowledge is gained solely through inductive reasoning—a position known as inductivism. He recognizes that there is actually a complementary interplay of deduction and induction in investigative operations, as well as a second level of induction that C. Peirce called imaginative retrodution or abduction. This involves an interaction between concepts, hypotheses, and theories and facts, observations, and experiments through imagination and logic. Moreover, at least some evidentialists are dissatisfied with the primarily deductive approach used in classical apologetics. They insist that a sound apologetic can and must consist primarily in an appeal to the facts. For Montgomery the facts take precedence over rationality and should be viewed as essentially self-interpreting. He explicitly rejects the claim that one must first establish the truth of a worldview and then view the facts within that worldview context. Rather, he insists, the facts determine the worldview. Facts are not made of wax, capable of infinite molding from the pressure of interpretive world-views. Facts ultimately arbitrate interpretations, not the reverse, at least where good science and not bad philosophy is being practiced. If one removes his nose from philosophical speculation and breathes the fresher air of societal and personal decision-making, he will find abundant illustration that facts must carry their own interpretations. They must be employed for any meaningful thought, theological or otherwise. Logical coherence or consistency is at best a negative test for truth, because it is possible to construct a coherent worldview that is actually false. His concerned wife and friends sent him to the friendly neighborhood psychiatrist. The psychiatrist determined to cure him by convincing him of one fact that contradicted his belief that he was dead. The fact that the psychiatrist settled on was the simple truth that dead men do not bleed, and he put the patient to work reading medical texts,

observing autopsies, etc. After weeks of effort, the patient finally said: Dead men do not bleed. The man looked with a contorted, ashen face and cried: Dead men bleed after all! Moreover, some evidentialists have argued that logical coherence or consistency is from one perspective faulty even as a negative test for truth. Montgomery, a Lutheran, follows Martin Luther in asserting that Christianity involves antinomies. An antinomy is an apparently intractable contradiction between two ideas, both of which we have good reason to accept as true for example, predestination and free will, or God as one Being and three Persons. Such humanly irresolvable paradoxes are to be believed, according to Montgomery, because we have evidence from Scripture that they are true, not because they pass the test of logical consistency. In defense of the rationality of believing such antinomies, Montgomery points out that antinomies exist in science as well as in theology. This follows from the inductive nature of the arguments typically employed. Inductive reasoning assembles facts and argues that a particular conclusion offers the best or most probable explanation of the facts. Such reasoning does not absolutely close the door on other possible explanations of the facts, and for that reason inductive arguments do not attain certainty for their conclusions. This lack of certainty is one of the most commonly criticized aspects of the evidentialist approach. If one concludes that God probably exists, or that Jesus most likely rose from the dead, how does that provide an adequate basis for the absolute commitment of faith in Jesus Christ to which people are summoned by the gospel? Evidentialists respond to this complaint on two levels. On one level they insist that the lack of rational certainty is dictated by the nature of the Christian message. For Montgomery the probabilistic character of apologetic argument is an unavoidable result of the fact that the Christian faith centers on historical events. Thus it provides no more than probable evidence for the truth of the Christian world view. No arguments that appeal to facts from the real world can furnish mathematically certain conclusions. But while empirical proofs fall short of certainty, all factual decisions in life are based on such proofs. For them, apologetic arguments are designed to show that their conclusions are at least probably true. That they are certainly true can also be known, according to evidentialists, but not by argument. Such certainty is a characteristic of faith and is made possible by the work of the Holy Spirit. There is no contradiction in claiming that something is probably true on the basis of a particular argument and also certainly true on some other basis. After all, if something is certainly true, then it is also probably true "with the probability of 1, or percent. Content-Neutral Methods The third point on which all evidential apologists agree is that evidentialism seeks to employ methods that are in principle acceptable to non-Christians as a means of convincing them of the truth of Christianity. These methods are modeled on those used by both Christians and non-Christians in various disciplines. The evidentialist goal is to avoid gratuitous or disputable assumptions about the nature of things. Montgomery, for example, prefers the empirical method because the truth-discovering presuppositions of empiricism assume as little as possible while providing optimal conditions for objective discovery. He rejects apologetic approaches that begin with dogmatic, truth-asserting presuppositions, whether of a philosophical theism as in classical apologetics or of the biblical Christian theism as in Reformed apologetics. Such are the a priori of empirical method, which are not only heuristic but unavoidably necessary in all of our endeavors to distinguish synthetic truth from falsity. Evidentialists believe it crucial to employ methods modeled on those of disciplines other than Christian theology or apologetics, so that non-Christians can understand and appreciate the validity of the arguments. These methods are closely related, because in fact legal evidences are a form of historical inquiry, pursuing an accurate understanding of past events related to cases brought before a court. In the previous chapter we surveyed a recent articulation by Montgomery of a juridical model of evidentialist apologetics. We also noted that such apologists as Thomas Sherlock and Simon Greenleaf developed evidentialism with a heavy reliance on the legal evidence model. Francis Beckwith, a former student of Montgomery, also prefers the legal evidence approach, especially in its defense of belief in miracles. Beckwith notes that miracle claims rely heavily on eyewitness testimony, and the legal model is particularly useful in evaluating such testimony. Dan Story, a former student of Montgomery, speaks for many evidentialists when he expresses a preference for the scientific method, precisely because it makes the truth of the Christian position verifiable for all people. It is the only valid and reliable way to determine truth: The [naturalistic] scientific worldview is subject to many distortions that evolve out of its erroneous presuppositions. But I am suggesting that the scientific method for discovering truth is the most

reliable method because it alone can be tested. The Postmodern Challenge to Evidentialism Evangelical evidentialist apologetics seeks to present evidence for the truth of Christianity using methods of inquiry that are in principle acceptable to non-Christians. This methodological approach has come under frontal assault from postmodernism. In essence, postmodernism is a philosophical movement that is rooted in modernism but proclaims the bankruptcy of certain aspects of modern thought. In particular, it denies the modernist belief that there is an objective truth about the world that can be discovered using reason. According to postmodernists, truth is subjective, not objective. Our knowledge of reality is a construction that we build up as we look at the world through our eyes and through the assumptions and experiences of our communities. This is true whether we are reading the Bible, watching the news, hearing testimony and arguments in a criminal court case, studying history, or doing science. The old rationalist, modernist ideal was of a single, objective method of gaining more and more complete and accurate knowledge of the real world in the disciplines of history, law, science, and theology. Postmodernists argue that this ideal is to be replaced by a methodological pluralism in which there is no one right way to look at the world. And therein lies the problem for evidentialism: People cannot find out the truth about God or any other ultimate issue in life through human reasoning or investigation. The postmodernist is thus left with no way at all to attain ultimate truth. For the Christian, on the other hand, the failure of modernism leaves us with revelation as the only viable way to know the truth about God and his world. In order to make this case classical apologists directly confront what they regard as the self-defeating, irrational character of postmodernism. That is, they argue that postmodernism is forced to make absolutist statements denying absolute truth. Evidentialists endorse the criticism that postmodernism is self-defeating, but their chief objection to it is that in everyday matters people do not accept a pluralistic, relativistic view of truth. Virtually all people are outraged when neo-Nazi groups claim that the Holocaust never happened. So much for the postmodern claim that history is whatever people construct it to be! When the Challenger exploded, no one would have been satisfied had NASA issued a statement claiming that the cause of the accident was different for different people; everyone demanded to know exactly what happened, and why. In short, evidentialists argue that while postmodernism may seem formidable in theory, in practice it may to a great extent be ignored when presenting the evidence for the truth of the gospel. Dan Story, for example, concludes: The majority of people on the street still view the world through modernist eyes. Even people who openly endorse postmodernism and argue for relativism do not live consistently with this philosophy—especially when it conflicts with their self-interests.

Chapter 5 : How do you know if a claim is true?

Unformatted text preview: Evaluating Arguments and Truth Claims (Critical Thinking, Chapter 8) LECTURE 12 Evaluating Arguments Once you have an argument summarized/standardized, you need to evaluate it to see if you are forced to accept the conclusion.

Key Terms Rhetorical Argument Campbell and Huxman define argument as "a claim or conclusion backed by one or more reasons or justification. Claim Campbell and Huxman define a claim as an assertion. They stress how it is an inference beyond the facts. In strategic discourse, a claim is a statement we make to an audience with an anticipation that they should agree with it. It is a statement. A claim is discourse. The very idea of a claim involves a wish about an audience. It deals with a search for agreement. The wish is that the audience will agree with the statement. A claim thus forwards a statement that we worry the audience will not agree to, but wish them to agree to. If we are certain that an audience will agree, it is not really a claim. If we are certain they will not, it also is not a claim. A claim works with contingency -- a question of whether the audience will agree or not. Quite literally, a reason is the reason the arguer gives for agreeing to the claim. After asking you to agree to a claim, the arguer should give you a reason for doing so. When you respond to an arguer by saying, "Why is your reason for saying that? The reason offered may be in the form of support , or another argument¹. Support Information or explanation given to an audience in anticipation that the support will earn their agreement to the claim. Support is discourse -- either information or explanation It relates to a claim It is chosen to satisfy the demands of the audience in search of their agreement to the claim. Another way of putting it: Support is information or explanation given as a reason for your agreement to a claim. The most important terms in argument begin with very common notions.

Chapter 6 : Argument - Wikipedia

For real world arguments (as opposed to strictly logical arguments) there are a number of elements. You can attack the argument by calling into question any of the elements, and you can evaluate an argument by considering how it might be attacked.

On the importance of evaluating truth claims Coert Visser, Cognitive scientists, such as Keith Stanovich , distinguish two basic forms of rationality: Instrumental rationality is about doing what works and epistemic rationality is about finding truth. My view is that it is dangerous to overlook any of these two types of rationality. Only focusing on what is true but forgetting to do what works may lead to neglecting to do things that help you to survive and remain connected to other people. In extreme cases this may lead to a situation in which your questioning dominant false beliefs may threaten governing institutions so much that they may want to isolate you or worse for example Copernicus and Socrates. In extreme cases it may lead to such pragmatism that individuals may gradually go along with and adapt to situations which systematically undermine human thriving of themselves or others. In the second half of the twentieth century, a relativist stance has gradually become more popular. This stance calls into doubt the knowability of objective truth, or, in a more radical form, the very existence of objective truth. Therefore, any kind of knowing can only be subjective or inter-subjective at most. Different people experiencing things differently, according to the relativist stance, have different ways of knowing or different "truths". Relativists argue that any view of reality is true in and for itself. Knowledge would thus always be local at best, never universal. This argument would imply that different cultures have different truths and that we should let go of the idea that objective truth statements are possible and also of the belief that "real" understanding of other people is possible. Another implication of radical relativism is that it is useless to think in terms of epistemic rationality and that we should focus only on instrumental rationality. Radical relativists are skeptical about science, viewing scientific claims as just another type of narrative and viewing the scientific process in purely instrumental terms as means to achieve some end, other than discovering objective truths. Truth versus truth claims: I find the rejection of the idea that we can learn about objective truth and reality unconvincing. I agree with Alan Sokal who says that the relativist stance systematically confuses truth with claims of truth. Take the example of the shape of the earth. Once, people thought the earth was flat and they turned out to be wrong. Later, they thought it was spherical which turned out to be wrong too it only approximates a sphere. Can we conclude from this that whatever we think will always be overturned later and that therefore truth really does not exist? The claim that the earth is flat is much more wrong than the claim that it is a sphere. The statement that the earth is a sphere can be empirically tested. Anyone who steps into a plane to fly to the other side of the earth implicitly acknowledges that the spherical view of the shape of the earth is more valid than the flat earth view. If we say that all claims are equivalent, there would be no measure of progress anymore, there would be no need for evidence and science anymore, and the whole notion of education would collapse. To deny that one claim could be further from the truth than another would be to say that anything goes. The notion of truth is useful but we should not think about truth in dichotomous terms but in continuous terms. I agree with Isaac Asimov in that we can distinguish between truth claims which are more or less true or false. Therefore, we can make progress in finding out what is true and what not. Objective truth as an asymptote: A helpful way to think about scientific progress is to view it as approaching an asymptote. In analytic geometry, an asymptote of a curve is a line such that the distance between the curve and the line approaches zero as they tend to infinity. In the figure below the dotted line is the asymptote. As you see, the curve is approaching the asymptote closer and closer. This is an interesting metaphor for how knowledge may develop. The asymptote reflects the true state of nature, reality as it is, independent of our interpretation of it. This view is relevant for science in the sense that it is the basis for viewing science as valuable and as capable of making progress see my article Improving Science. But it is also relevant outside science. In everyday life, we are bombarded every day with truth claims, from websites, from our friends and relatives, from journalists, from commercial parties, from professional authorities, and from religious leaders. Not being able to distinguish between false

and more accurate truth claims makes us vulnerable to manipulation. In mild cases this may lead to waste; in more serious cases this may lead to great harm. Once we know this, we can learn to distinguish false truth claims from more truthful truth claims. How to identify false claims: The more truthful a truth claim can be considered to be, the more it meets three requirements: A good reason to distrust a truth claim is when it is based on defective reasoning. Examples of this are truth claims which are crucially based on a circular argument or which are self-contradictory. Another good reason to distrust a truth claim is when it is unclearly defined. One example of this is when vague and complex words are used which are unrelated to the relevant scientific knowledge base. Another example is a claim which is so broad that it is impossible to disprove. A final good reason for distrusting truth claims is when there is lack of supportive evidence and availability of counter-evidence. The power of questions: In discussing these matters with other people I think it is often not wise to use a confrontational style. The best way to help people improve their claim evaluation skills is to be respectful of them and ask them questions while being honest about your own perspective. These questions may inspire them to start evaluating their beliefs without becoming defensive.

Chapter 7 : The Progress-Focused Approach: On the importance of evaluating truth claims

Philosophers have agreed upon a number of criteria or test to evaluate and choose between competing philosophical claims and theories: clarity, consistency, coherence, comprehensives, _____, and compelling arguments.

Introduction We are all familiar with the traditional conception of what makes for a good argument: Almost all theorists that I am aware of take it that an argument is good if it fulfills its purpose, and it is widely agreed that arguments can fulfill their purpose even when not all of their premises are true, or they are not deductively valid. Still, some theorists retain a focus on the truth-directed nature of arguments, and those theorists rightly hold that, given such a focus, truth plays an important role in the evaluation of arguments. Johnson goes so far as to 1 At least, that is the core of the traditional view. Further constraints are typically added, such as that the argument not be question-begging. What I propose to do in this paper is to discuss the role that truth plays in the evaluation of arguments, when the purpose of arguments is understood as truth-directed in some important way. I begin with a discussion of truth as the purpose of arguments. In the second section of the paper, I give an argument to the effect that the theory of argument evaluation ought not to involve truth as a constraint on premise adequacy. The third section contains my argument for the positive claim that the proper place for the concept of truth is in the metatheory in terms of which the theory of evaluation is worked out. Truth as the purpose of at least some arguments The goodness of an argument, I take it, is a function of how well it fulfills its purpose. So, first of all, it must be admitted that there are many conceptions of the nature and purpose of arguments that do not involve persuading anyone of the truth of a conclusion: Walton , Blair , van Eemeren and Grootendorst , Hitchcock , and Pinto , to name a few, all give accounts of argument on which truth is not the central purpose. However, there is also a respectable contingent of thinkers that takes arguments to be directed towards truth. Finally, Johnson , pp. More specifically, I take the goal of the rational persuasion of an interlocutor or audience of the truth of a claim to be the best candidate for the general purpose of arguments, and arguments ought to be evaluated according to how well they fulfill that purpose. That is not to say that I take the purpose of arguments to be to establish the truth of their conclusions beyond all doubt; rather, the purpose is to reach a conclusion that is most rational, from the point of view of the participants in the argument, to take to be true. My case for thinking that arguments are truth-directed, in a nutshell, is the following: An essential part of the content of a proposition is its truth-conditions. To assert a proposition *i*. Assertions are always assertions of propositions. Arguments consist of premises asserted in support of asserted conclusions. The conclusion of an argument is the assertion, on the basis of the premises, that the truth-conditions of the propositional content of the conclusion are satisfied. From Premises 2, 3, and 4. I expect that there are several objections that will come to mind, though, which I will try to answer presently. First of all, it might be urged against Premise 2 that one might make an assertion without wanting to commit oneself to the claim that the truth-conditions of the asserted proposition are satisfied. Truth and Argument Evaluation without wanting to commit herself to the truth of the proposition that she is asserting, because its truth-conditions cannot in principle be verified. By way of response to this objection, notice that if the scientist only means to commit herself to the claim that her assertion is consistent with the observed phenomena, then she is not in fact asserting a proposition about the singularity of the black hole itself – if she were, she would be committed to the truth of that proposition. Instead, she is making the more qualified assertion that the proposition she is putting forward is consistent with the observed phenomena. That is, she is making an assertion *q* about a proposition *p* that *p* is consistent with observed phenomena , not asserting *p*. That more qualified proposition, *q*, is one to which she is committing herself, and in so committing herself, she is committing herself to its truth. A different way to push the objection to Premise 2, if we take the content of a proposition to be identical with its inferential role, is that someone might want to assert a proposition and only intend thereby to commit himself to those parts of the meaning of the proposition *i*. However, if an arguer is explicit about intending to assert *p*, then whether he wants to be committed to the truth of *p* is irrelevant. Assertions are public commitments; we are committed to the content of our assertions whether we like it or not, and that certain truth-conditions are satisfied is part of the content of an asserted proposition. The second

objection that I expect will naturally come up is against Premise 4. The objection is that not all arguments have asserted propositions as their conclusions. There are two ways to make this objection: Reasons might be offered for doubting a proposition, for example, or for having some other attitude toward a proposition as in Pinto. Furthermore, the point of a reductio argument is not to assert the conclusion that is shown to follow from the assumed premises, but rather to reject a guilty premise or assumption. Sometimes the author of a reductio argument will explicitly conclude with the assertion of the negation of one of the premises, but sometimes not. I admit that this objection has some force. An adequate Patrick Bondy response to it would likely take an entire paper to itself. It will have to suffice for now to remark that arguments that appear to have conclusions that have a truth-value but are not asserted can be viewed as having implicitly asserted conclusions. For example, in a reductio where it is not explicitly asserted as the conclusion that a guilty premise or assumption is to be rejected, there is an implicit conclusion to that effect. In the case of an argument that a proposition ought to be doubted, rather than accepted, we should take the conclusion of the argument to be of the form: A final objection to the argument that I put forward above is that even if my argument is a good one, it does not establish what I want: I want to say that arguments are truth-directed, but all that the argument above shows is that arguments essentially involve the assertion of the truth of their conclusions. It does not show that arriving at the truth of the conclusion is the purpose of arguments. On the face of it, though, it looks to me like the argument does support the view that arguments are truth-directed. If an argument is the assertion of premises in support of an asserted conclusion, and the assertion of a proposition essentially involves the assertion of its truth, it seems to follow that what we do in giving arguments is that we give reasons to think that the conclusion is true. The only way that I can think to object to this line of reasoning is to point out cases where arguments are used for purposes other than to show that their conclusions are true for example, to simply get an issue on the table, to prove that one is very witty, etc. However, it does not follow from the fact that arguments can be used for many purposes that there is no central purpose of arguments. A hockey stick can be used, among other things, to defend oneself against a mugger, but that does not mean that the purpose of a hockey stick is to defend oneself against muggers, nor that the goodness of hockey sticks is to be measured by how well they can be used for that purpose. A good hockey stick is one that fulfills the particular function of hockey sticks well; even bad hockey sticks can serve other purposes well. Similarly, it does not follow from the fact that arguments can be used for various purposes that there is no central purpose of arguments—and if the particular purpose of arguments is to achieve rational persuasion of the truth of a proposition, then arguments ought to be evaluated according to how well they fulfill that purpose. That concludes my case for taking arguments to be truth-directed. It is not necessary to agree with me about the general nature and purpose of arguments in order to accept the discussion of argument evaluation that appears in the following sections of the Truth and Argument Evaluation paper, though. Most theorists agree that some arguments, at least, aim to give good reasons to believe that their conclusions are true, and so sometimes, at least, arguments ought to be evaluated according to how well they achieve that goal. If you accept that arguments generally are truth-directed, then you can accept that the evaluative criteria that I will discuss will be perfectly general, applying to arguments across the board. If, on the other hand, you do not accept that general claim about the purpose of arguments, still the following discussion will be of interest as long as you accept that some arguments have that purpose, so that the truth-directed evaluation of arguments discussed below will apply to the subset of arguments that aim to show that their conclusions are true. I will not argue for the theory of truth that I have in mind, because there just is not the space to do so here although I will respond at the end of the paper to an objection from the deflationist camp, but I want to be clear about the position I am advocating. Nor do I have in mind a relativist, pragmatist, or coherentist theory of truth. Given the DS-account of truth, the purpose of an argument is to rationally persuade an audience that the conclusion of the argument successfully describes that part of reality which it purports to describe. Goldman restricts his discussion to ordinary factual argumentation, p. Now, I do think that there are truths in practical discourse, but that need not complicate the descriptive-success account of truth; it looks to me as though the account can easily cover practical as well as ordinary factual discourse. Provided that there are real obligations or, more generally, real practical imperatives, the

descriptive-success account of truth can handle them, because real imperatives can be accurately or inaccurately described, just like ordinary facts can. If someone should object that there just are no Patrick Bondy truth-makers for practical claims, the response that I will want to give is that whatever it is that generates obligations or practical recommendations generally is what makes the propositions about them true. Johnson argues that premise truth ought to be included in the set of criteria that we employ for evaluating arguments, alongside of premise acceptability. He admits that there are good reasons for not employing the truth criterion in the evaluation of arguments, but he argues that there are even better reasons for employing it. The reason Johnson gives for maintaining the truth requirement is that it is difficult to see how we could develop a theory of evaluation without having some recourse to it. Theorists who propose to do without the truth requirement either make use of it unofficially, or continue to rely on it by employing terms that presuppose a commitment to it, or else they use the truth requirement in their metatheory, employing it in the metalanguage in which they develop their account of argument evaluation 5 One might object here that nothing generates practical imperatives. If that is the case, so be itâ€”but that is no problem for the descriptive-success account of truth; practical claims will simply turn out to be false, in that case, because a practical claim says that something is the case that we ought to be charitable, for example , but what it purports to be the case, is not we have no obligations; a fortiori, we have no obligation to be charitable, so any purported description of our obligation to be charitable is bound to be unsuccessful. Truth and Argument Evaluation Johnson , p. Given that Johnson takes the purpose of arguments to be rational persuasion of the truth of a claim, he also includes the requirement that a premise be both accepted by the audience and rationally acceptable to them. The idea here is that if a claim is not accepted by the audience, or if they do accept it but it is not rational for them to do so, then it cannot be used as a premise in an enterprise that aims to achieve rational persuasion. It might be an effective premise, if it plays to the emotions or biases of the audience, but the persuasion that ensues in that kind of case is not rational persuasion. The premises that an arguer employs must, then, either be supported themselves by a good argument, or else they must be such that it is rational for the arguer to believe that the audience will accept them, and also that it is in fact rational for the audience to accept them Johnson , pp. I would also add that it must be rational for the arguer to accept them as well. More about this below. In his discussion of the truth criterion, Johnson often talks in terms of a requirement e. At one point, though, in response to the argument that the truth of a premise is neither necessary nor sufficient for the premise to be adequate a complaint that comes up, for example, in Pinto and Govier , Ch. Presenting truth as a standard or criterion is more palatable than presenting it as a requirement, because examples of false but acceptable premises do not then count as counterexamples. However, I still have some misgivings about this weaker presentation of the truth criterion. The reason I worry about privileging the truth of a premise over its acceptability in any kind of case is that premises that are acceptable as opposed to merely accepted are more suited to fulfilling the purpose of arguments: Just when a premise counts as acceptable is still an open question, I take it; Johnson , pp. Freeman develops an account of acceptable premises, as premises for which there is a presumption in a dialectical situation. However the acceptability requirement is worked out in the end, though, it is clearly crucial for premise adequacy: Admittedly, Johnson sometimes gives the impression, when he is arguing that we should privilege truth over acceptability, that what is really the issue is whether an arguer ought to employ premises that she takes to be true, or premises that the audience takes to be true , pp. Johnson is correct, I take it, in wanting to say that an arguer may not employ premises that she believes to be false, but that requirement is better put in terms of the acceptability of a premise from the perspective of the arguer, rather than in terms of the truth of the premise. I see no reason to privilege the epistemic position of the arguer over that of the audience, by associating her perspective with the truth criterion; both arguer and audience are, in principle, equally well-placed to determine the truth of a premise. The same criterion ought to apply to each of their assessments of the truth of a claim, and the appropriate criterion I am arguing is acceptability. But if the purpose of arguments is rational persuasion, then it is necessary that the premises of an argument be rational for both the arguer and the audience to accept; if that condition is not met, then any persuasion that might ensue will not be rational. Truth and Argument Evaluation premises, acceptability ought to be seen as a necessary condition of premise

adequacy. What is more, acceptability also appears to be sufficient for premise adequacy: There is nothing more that we ought to require for the adequacy of a premise than that it be rational to accept. Johnson writes that he sees no reason why we should not want our premises to be true as well as acceptable, p. Now, in an epistemically ideal world, all of the claims that are rational to accept would be true. In the actual world, what is rational to accept is not always what is true, but still the rational status of a proposition is the best indicator of whether we should take it to be true. Whenever a premise is rational for the participants in an argument to accept, then, it is a good premise to employ. The upshot of all of this is that acceptability is both necessary and sufficient for premise adequacy, which means that the truth of a premise is beside the point for premise adequacy; what matters is whether it is rational for the participants in the argument to take them to be true.

Chapter 8 : Learning to analyze and critically evaluate ideas, arguments, and points of view

A deductive argument is valid if the truth of its premises is sufficient to guarantee the truth of its conclusion. The argument "All men are mortal and Socrates is a man, so Socrates is mortal" is an.

Every fact an author provides might be accurate, and yet they might leave out crucial information needed to prove the claim: They might have insufficient evidence. One key step in evaluating evidence, therefore, is to decide if it is sufficient. What makes evidence sufficient to prove a claim? There is no simple answer to this question. This is my claim. This might be true, but is it enough? For many people, that would be enough to convince them that rain is coming, or at least likely. Generally speaking, of course, more evidence is better, and more types of evidence are better. In the first example above, there was just one piece of evidence clouds and one type physical detail. You can also consider the total evidence that could be included, if one were able, and ask whether the author has provided a significant portion of that. For example, say I wanted to prove that Community and Technical Colleges in Washington are suffering from budget cuts, and I give examples from 15 of the 34 colleges in the state. For many, this would be enough to show that the colleges in general are suffering. But even when discussing insufficient evidence, try to think about what it needs: Each case is different and will require its own evaluation. Instead, think about whether the evidence feels like enough to you, and why. Think about how many separate facts or examples have been given, the different types of evidence, and the total amount of evidence that could be given if there was room. Relevant Evidence Evidence is relevant when it has a definite relationship to the claim. Notice that I said definite. The relationship does not have to be direct or clear, but it has to be there. Irrelevant evidence is one of the most common problems in arguments, and is used at times by unscrupulous writers and speakers in a deliberate attempt to confuse or mislead. Just because it looks irrelevant at first glance does not mean it has no connection to the claim. Sometimes the connection is there but not direct or obvious. A good technique is to start by assuming the evidence is relevant and then try to figure out how. This trains your mind to spot connections that may be hidden. If after giving the author the benefit of the doubt in this way you still cannot see a connection, you can be more confident that the evidence really is irrelevant. Relevance is not a binary yes-no, either-or. Rather, it is a matter of degree. The person selling it points out that it has a really nice paint job. Relevance is probably the easiest of our three criteria to evaluate. The simplest way to do it is, if you think the evidence is relevant, to explain how it relates to the claim. If you think it is not, explain why it does not connect, or give an example that would be more relevant. Representative Evidence Representative comes from the word represent. Evidence represents, or gives us a picture of, the topic, and representative evidence gives us a complete and undistorted picture. Another word for representative is typical. Representative examples are those that are typical, or most like the majority of other items in the same group. This is different from saying the evidence is true or accurate. I can give you a true statement that nevertheless completely distorts reality. For instance, in trying to prove the age of my students, suppose I point to the oldest or the youngest person present. This is sometimes called selective evidence or cherry picking, because you select or pick only that evidence that supports your position. Representative evidence is absolutely essential. One reason is simple and practical: He has given away billions of dollars! Does this prove my claim? Is Gates a typical American? Therefore, he does not represent Americans in general. He is not the best example. A much better example would be an ordinary working person who makes an average income, because such a person is more likely to represent a typical American. Researchers go to a lot of trouble to make sure their evidence is representative. For example, in surveys and polls, they work hard to get a random sample of people to talk to. Because picking people at random means you get a typical or representative example. Sometimes a single example is all we need, because that one example is completely representative. One typical bike will do the trick. More often, however, no one example is perfectly representative. We need at least a few to cover the ground. Even then, however, we usually have room for just a small subset of the total, so the ones we choose should be as representative as possible. This is a major reason why statistics are such an important form of evidence. Many of the subjects we are interested in are way too big to cover with just a few examples. Go back to the question

of whether Americans are generous. There are over million Americans, and they are incredibly diverse in age, income, religion, ethnicity, gender, sexuality, political beliefs, region, language, and more. There is no way you could pick enough examples to represent the entire group. What you can do, however, is give a statistical breakdown. No one example, or small group of examples, could accurately represent this complex picture, or tell us how many Americans fit this category. Not only that, but they can give you a very precise breakdown. An anecdote is a little story or example, and as such it is much less likely to be representative. One or two or even a dozen examples are no substitute for an accurate statistical measure. When deciding if a piece or a collection of evidence is representative, it is crucial to ask what it is trying to represent. Maybe most Americans would do the same if they had his money. Think about the bicycle example: So, what do you do? How do you decide if a piece of evidence is representative? This is where you must use your judgement and your knowledge of the world. Most often, you have to make an educated guess.

Chapter 9 : Critical Thinking Worksite: Argument Evaluation

Critical thinking is a process of evaluation which uses logic to separate truth from falsehood, reasonable from unreasonable beliefs. If you want to better evaluate the various claims, ideas, and arguments you encounter, you need a better understanding of basic logic and the process of critical thinking.

Learning to analyze and critically evaluate ideas, arguments, and points of view Series Editor: It is only through this critical evaluation that students can distinguish among competing claims for truth and determine which arguments and points of views they can trust and those of which they should be skeptical. Learning how to analyze and critically evaluate arguments thus helps them to develop a sound framework to test their own arguments and advance their own points of view. Objective 11 reflects an important component of the educational process “training students in the habits of thought in our disciplines. IDEA research has found that it is related to Objectives 6 through 10 and Objective 12, which all address activities at the upper levels of cognitive taxonomies, activities requiring application and frequent synthesis and evaluation of ideas and events 3. There is a link between this objective and developing deeper understandings of the self and the world. By encouraging our students to adopt a critical framework, we prepare them not only to engage in scholarly conversation and debate in our disciplines, but also to be engaged citizens in a democratic society. As Patricia King points out, a student who appreciates why people approach controversial issues in her discipline from different perspectives is more likely to see and appreciate the reasons people approach social controversies from different perspectives. By the same token, a student who evaluates knowledge claims in his major by reference to the strength of the evidence in support of conflicting hypotheses would also be more inclined to evaluate contradictory claims about current moral issues by reference to the weight of available evidence 5, p. The ability to weigh alternatives, make decisions, and evaluate contradictory evidence is crucial to scholastic endeavors and adult life more generally “to personal happiness, professional success, and civic engagement. To achieve this and related objectives, instruction must incorporate intellectual challenge and activity; opportunities for creative or original work; finding and using information and translating that information into coherent communication; and opportunities to produce original work rather than simply recalling information. This is supported by IDEA research finding that instructors stressing this objective frequently stimulate students to intellectual effort 8 , introduce stimulating ideas about the subject 13 , ask students to share ideas 16 , and assign work that requires original or creative thinking Rather than simply presenting information, be explicit with your students about how you approach such questions, defining critical thinking in your field and modeling disciplinary ways of thought. Engage students in activities that require sophisticated thinking and design assessments that call on students to demonstrate thinking skills. Below, we provide specific ideas for how to teach students to analyze and critically evaluate ideas and assess their abilities to do so. These activities and assessments require students to identify assumptions, weigh competing evidence, make decisions, imagine alternatives, and build arguments. In math, sciences, and engineering courses, encourage students participating in study groups not only to share ideas for solving problems but also to provide reasons for the problem solving ideas they advance. Have students respond to an editorial in a newspaper or to a review essay in a scholarly journal. For that response, ask students to identify unstated assumptions, biases, and points of views and show how they undermine the argument the author is making. Teach students to use a pro and con grid to analyze ideas and points of view 7, see pages Take time in science and engineering classes to explore the ethical considerations of research questions and experimental design. In organized class debates, ask students to argue for a point of view counter to their own. Such problems have no known answer or solution and cannot be solved with formal rules of logic or mathematical formulas. Ask students to come up with multiple solutions for each problem and rank the viability of each solution. Help students develop strategies for systematically gathering data according to methodologies in your discipline, assessing the quality and relevance of the data, evaluating sources, and interpreting the data 5, p. Encourage students to engage their critical reasoning skills outside of the classroom 5, p. Assessment Issues To teach critical evaluation, we must define critical thinking in general and in the discipline, model habits of

disciplinary thought, engage students in activities that require sophisticated thinking, and design assessments that call on students to demonstrate thinking skills. Instructional assignments and activities that promote critical thinking have to do more than present information and ask for recall. Rather, they must ask students to demonstrate their thinking, including their analysis and critical evaluation of ideas, arguments, and points of view. These assignments ask students to do more than reproduce what they know; they ask them to produce new knowledge. Angelo and Cross 7 offer many techniques for assessing critical thinking, problem solving, analysis, and related skills. Echoing and expanding on their ideas, we make the following suggestions: Have them carry out the experiment and document the results. Design a writing assignment that prompts students to position themselves within a scholarly or real-life debate. Ask students to review a scientific paper, assessing the evidence the authors use and how they use it. Allow students to choose a current political issue relevant to a community to which they are attached. Have students use a double-entry journal for reflection and self-assessment of this learning objective, using guided questioning. It also reinforces that this process is ongoing, not just an assignment for a class. Sample guided questions include: What happened when you analyzed and critically evaluated ideas, arguments, and points of view? What was your reaction as you went through this process? What did you learn about yourself? How can you apply what you learned to your education or your life? Construct a rubric i. References and Resources Perry, W. Forms of ethical and intellectual development in the college years. Taxonomy of educational objectives: Book 1, Cognitive Domain 2nd ed. Applying the science of learning to the university and beyond. Learning to make reflective judgments. Tools for taking charge of your learning and your life.