

Think Again: How to Reason and Argue

A Duke University Coursera MOOC, 2012-2013

The first offering of *Think Again: How to Reason and Argue* was taught over twelve weeks, from November 26, 2012 to March 11, 2013, as a massive open online course (MOOC) by Walter Sinnott-Armstrong, Chauncey Stillman Professor of Practical Ethics in the Philosophy Department and the Kenan Institute for Ethics at Duke University, and Ram Neta, Associate Professor of Philosophy at the University of North Carolina, Chapel Hill. The course was described as being appropriate for anyone interested, from high school age and beyond. Apart from knowledge of English, no special background was required. The course focused on constructing good arguments and effectively understanding and analyzing others' arguments. It ran on the Coursera platform, as part of Duke's partnership with the educational technology company. This report presents a summary of the development and delivery of the course including student demographic information, outcomes, feedback, and instructors' reflections.

Executive Summary

- This course offered over 18 hours of video lectures, which were delivered in 82 segments. The video segments were divided into four thematic sections. Students were assessed with a graded quiz at the end of each section.
- Video production began in July 2012 with four weeks of video lectures being completed before the course started and the rest completed while the course ran.
- Developing and delivering this course required more than a thousand hours of work with about 75% of the total reported time contributed by the instructors.
- More than 220,000 students registered for the course; almost 128,000 watched the first video; approximately 78,380 attempted the first homework exercise and almost 10,000 students watched the final video. At the end, 5,322 students earned a Statement of Accomplishment with a substantial subset of 3,048 students earning a Statement of Accomplishment with Distinction.
- Students from 121 different countries responded to the post-course survey. The United States had the highest representation (24%) for a single country. Seventy six percent of students came from other countries with Brazil, Spain and the United Kingdom being best represented (about 5% for each of these countries). Participants ranged in age from pre-teenage to post-retirement age with approximately 80% being over 25 years. In addition 81% of course participants already had at least a Bachelor's degree, 22% were enrolled students and 42% were employed. Respondents to the post-course survey were slightly older and more educated than respondents to the pre-course survey, while slightly higher percentages of students and employed individuals responded to the pre-course survey relative to the post-course survey.
- Forums were very active with about 28,800 original posts and 24,300 comments.

- Students rated the course highly (an average of 5.7 on a 7-point scale) and rated the instructors very positively with 86% agreeing that the instructors enhanced their understanding of the material.
- There were a small number of criticisms of the course. These mainly related to quiz content not being adequately covered in the lectures and the poor quality of video shooting and editing for some of the videos.
- The instructors plan to offer this course again on the Coursera platform. They intend to change the format of their campus courses, by incorporating all the course materials made for the *Think Again* MOOC.

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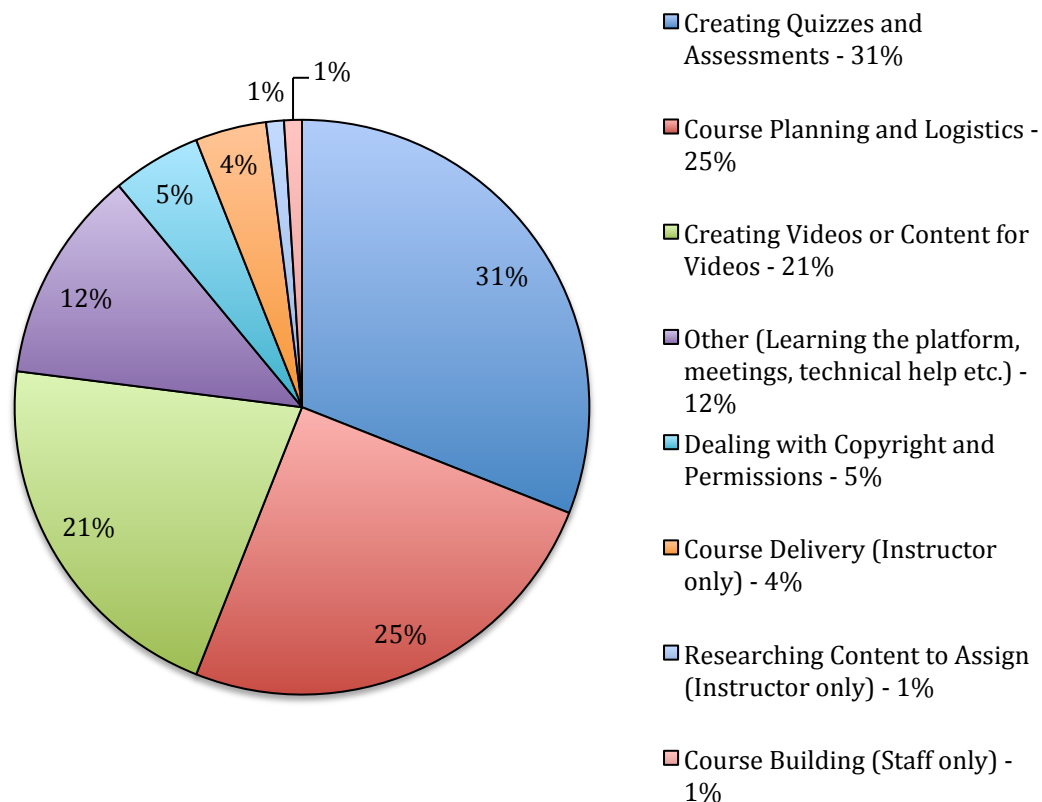
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Producing and Delivering the Course Content

The instructors began video production in July 2012 using a high-definition webcam to record videos. Screenflow screen capture software was used to capture relevant PowerPoint slides and a tablet with OmniDazzle software enabled annotation of the slides. A student assistant produced PowerPoint slides, on-screen graphics and animations to highlight content. This material was then edited into the webcam videos. Personnel at Duke's Office of Information Technology also provided editing services for several of the videos. A small number of commercial television and film clips were used, along with video "sketches" of student actors that were previously produced for a course taught at Dartmouth by Walter Sinnott-Armstrong.

More than 18 hours of video lectures were delivered in 82 segments. Videos ranged in duration from about three-and-a-half minutes to approximately 28 minutes with the average duration being 13 minutes 25 seconds. The syllabus was divided into four thematic sections with a graded quiz at the end of each section. Each week contained a series of short lectures with homework exercises provided for practice. Students were invited to submit an optional, ungraded video or written argument of up to 100 words. Twelve of these were chosen for comment in the week 12 lectures. A timeline of the course is provided in Appendix A and a full list of video topics and some sample screen shots are included in Appendix B.

Fig. 1. Instructor and Staff Time Spent Developing and Delivering *Think Again*



The instructors contributed about 75% of the total of 1,166 hours reported for developing and running this course. In addition to the instructors, an academic technology consultant and three teaching assistants spent approximately 300 hours performing various support functions including consulting, building the course and quizzes into the Coursera platform and monitoring the forums. Figure 1 above illustrates the breakdown of the percentage of reported time spent on the various aspects of *Think Again*.

Interaction with the Course Content

Think Again opened in November 2012 with the largest student enrollment in a Coursera course up to that point. More than 132,000 unique students accessed at least one video during the course. The number of unique students watching lectures in a single week peaked in the first week at almost 128,000 (Fig. 2). Consistent with the pattern observed in other MOOCs, the number of students watching videos decreased precipitously between the first and second weeks. Unique viewers continued to decline sharply till week six and then continued to decrease more gradually with about ten thousand students being active till the end (Fig. 3).

"Our huge enrollment shows that many people from all walks of life, all cultural backgrounds and all points of view want to learn how to think about the issues that matter to them."

- Walter Sinnott-Armstrong

Fig. 2. Student Activity in *Think Again*

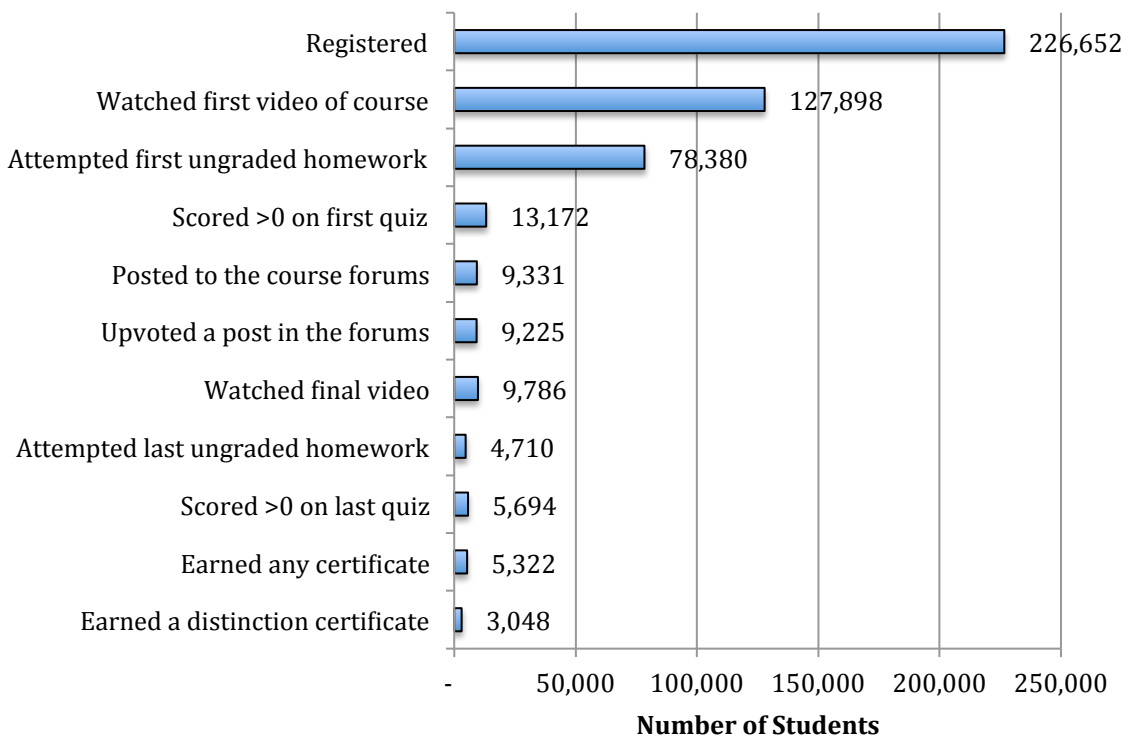
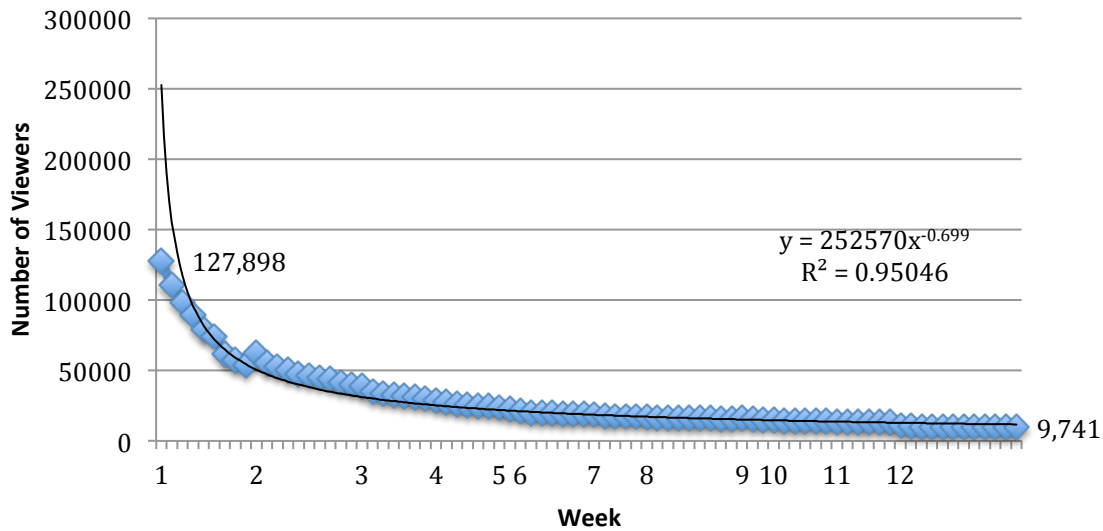


Fig. 3. Think Again 2012-2013
Unique Viewers across 82 Video Segments



In total, participants streamed videos more than 2,400,000 times and downloaded videos more than 1,850,000 times. The decrease in the number of students watching videos approximated a power law function ($y = 252570x^{-0.699}$) indicating that the number of viewers (X-axis) decreased as a function of an increase in the video segment number (Y-axis). Students attempted homework exercises, which allowed them to practice what they had learned in video lectures. In addition, four multi-part graded quizzes were used to assess student learning. A similar declining participation trend was seen in the quizzes and homework exercises as for the lectures. Some of this attrition is attributable to student intent; only 60% of the almost 30,000 students who took the pre-course survey indicated that they planned to earn a Statement of Accomplishment (SoA).

"I never imagined that I would have so many students in my entire career. It would take hundreds of years to reach that number of students in a normal classroom."

- Walter Sinnott-Armstrong

Interaction among Course Participants and Staff

The instructors communicated with students by posting announcements on the Home page of the *Think Again* Coursera site. These announcements were also emailed to course participants. In addition to messages welcoming students to the course and to each week's lectures, announcements also informed students of topics to be covered in the week ahead, addressed common concerns expressed on the forums, announced quizzes and assignments, and suggested additional reading

"I found that letting students answer questions by other students was better than intervening... I was pleasantly surprised by how much many students went out of their way to help other students in the forums."

- Walter Sinnott-Armstrong

material.

Students interacted with each other in the 4,976 threads on the discussion forum by posting questions or topics for discussion, commenting on the posts, and up-voting or down-voting posts and comments (Table 1). Instructors were actively reading forum posts between 1 to 5 times a week and posting between 1 to 3 times a week. A teaching assistant who monitored the forum each day was surprised and impressed with the creativity and effectiveness of peer instruction. In addition, he responded to students where possible, regularly presented students' questions and concerns to the instructors, and then posted their responses on the forum.

"Instructor participation in the discussion forums is widely appreciated"

- Ram Neta

Forum Interaction	Course Participants	Total Number of Items
Posts	9,331	28,806
Comments	5,221	24,276
Votes	9,225	79,252

Table 1. Student Participation in Forums

Students also created several Facebook discussion groups for the course. This included language-specific groups, such as the Spanish Speaking Group and the Vietnamese Group.

Survey and Feedback from Students

An announcement informing students that Statements of Accomplishment were available was emailed to all registered students and posted on the course site when final grades had been computed. This announcement also requested that students complete a short post-course survey and provided a link to the questionnaire. The intent was to use feedback from this survey to improve further iterations of *Think Again*. More than three-quarters (76%) of the 2,641 respondents had earned a SoA. The summaries below reflect the feedback obtained from all respondents irrespective of whether they had achieved Statements of Accomplishment or not. The data, however, are probably more representative of the students earning the Statements of Accomplishment than of all course participants.

Student Demographics

More males (56%) provided feedback in the post-course survey than females (44%). Approximately 80% of the respondents were older than 25 years and 81% held at least a Bachelor's degree (Fig. 4 and Fig. 5). This group was slightly older and more educated than the group of students who responded to the pre-course survey (70% were older than 25 years and 75% had at least a Bachelor's degree). This indicates that this was generally a highly educated group, mainly older than typical college-age students. Only about a quarter of the students responding to the post-course survey, however, had had any formal Philosophy education prior to this course (Fig. 6), which was slightly lower than the pre-course survey findings (27%). Slightly lower numbers of respondents to the post-course survey were students (22%) and employed on either a full-time or part-time basis (42%) as compared to the pre-course survey respondents – 26% were students and 49% were employed. Some of the common responses of

those who selected “Other” to describe their current status were “retired,” “unemployed,” “self-employed” and “stay-at-home mum”. Note that participants could choose more than one option in response to the question about their current status (Fig. 7). Students from 121 different countries were represented in the course. Although the United States had the highest representation (24%) for a single country, 76 % of students came from other countries with Brazil, Spain and the United Kingdom being well represented (about 5% for each of these countries).

Fig. 4. Age Distribution of Students
end of course survey, n=2346

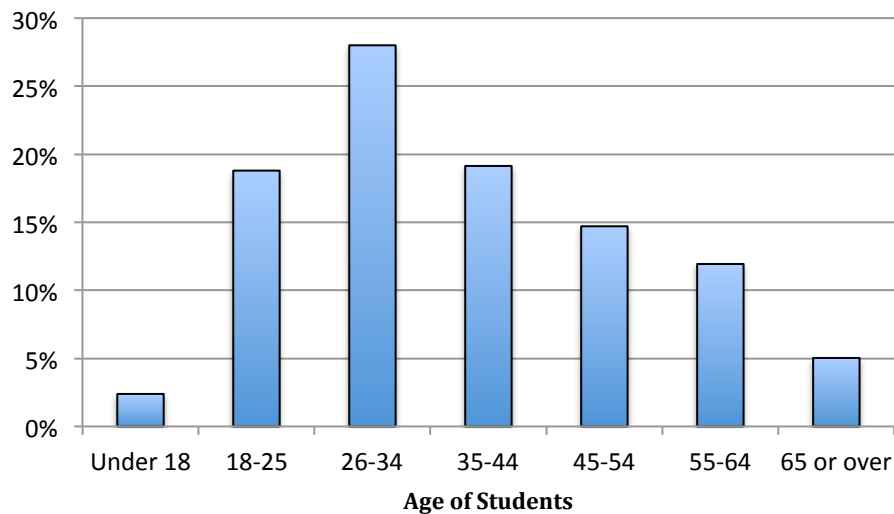


Fig. 5. Prior Educational Attainment
end of course survey, n=2374

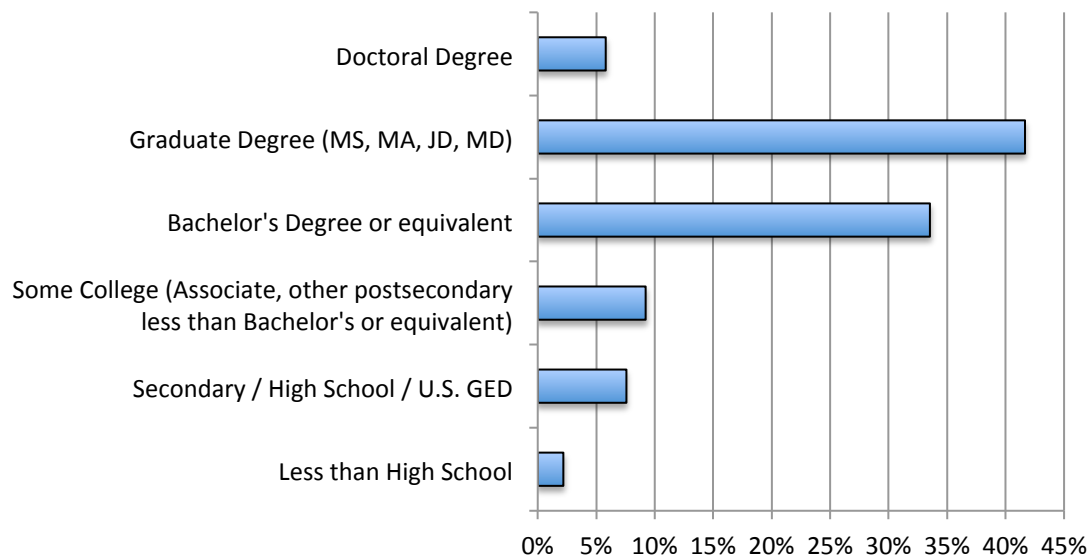


Fig. 6. Prior Experience in Subject Area
end of course survey, n=2374

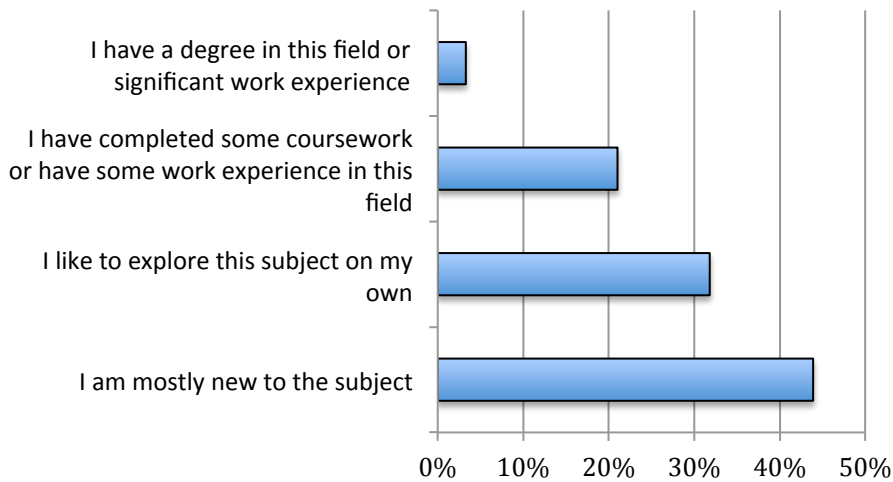
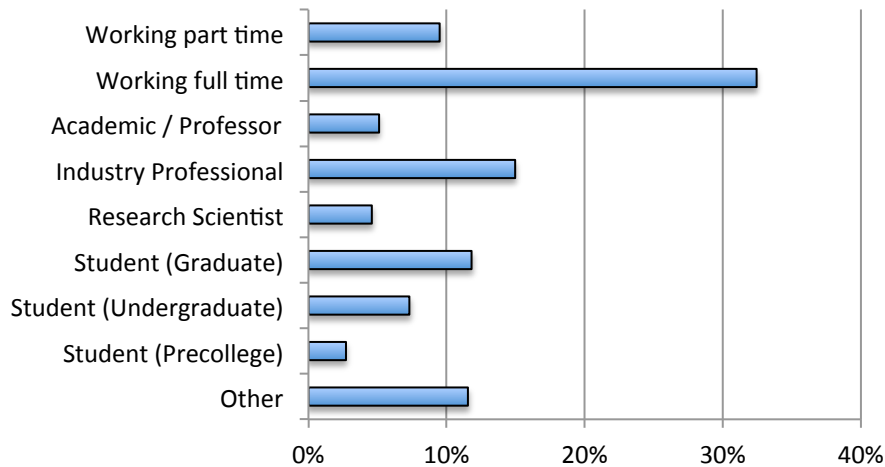


Fig. 7. Current Status
end of course survey, n=3421
 (respondents could choose more than one option)



Reasons for Enrolling

The most common reason for taking the course was a general interest in the topic (36%). Other notable reasons for enrolling in the course included extending current knowledge of the topic (17%), professional development (15%) and an interest in how these courses are taught (14%). A very small percentage of participants enrolled to supplement their college classes, to decide if they wanted to pursue this subject in college, because they could not afford to pursue formal education or because they were geographically isolated (2%-5%). Students commonly offered

“personal growth/development,” “to improve/practice my English,” and “intellectual challenge/engagement/stimulation” as other reasons for taking the course.

Overall Course Experience

Students gave the course an average rating of 5.7 on a 7-point scale, with 1 being poor and 7 being excellent. Ninety-three percent of students who achieved a SoA, and 66% of those who did not, rated the course 5 or better. Almost two-thirds of students indicated that the course was just right in terms of difficulty, length and pacing (Tables 8-10). Respondents overwhelmingly (95%) indicated that they would take another online course based on their experiences in this course. Most students indicated that this course compared very favorably with other online courses they had taken with some indicating this was among the best of the online courses they had taken. Students typically indicated appreciation for the content, structure and entertainment value of the course. There were a small number of criticisms of the course. These mainly related to quiz content not being adequately covered in the lectures and the poor quality of video shooting and editing for some of the videos.

Fig. 8. Rating of Difficulty

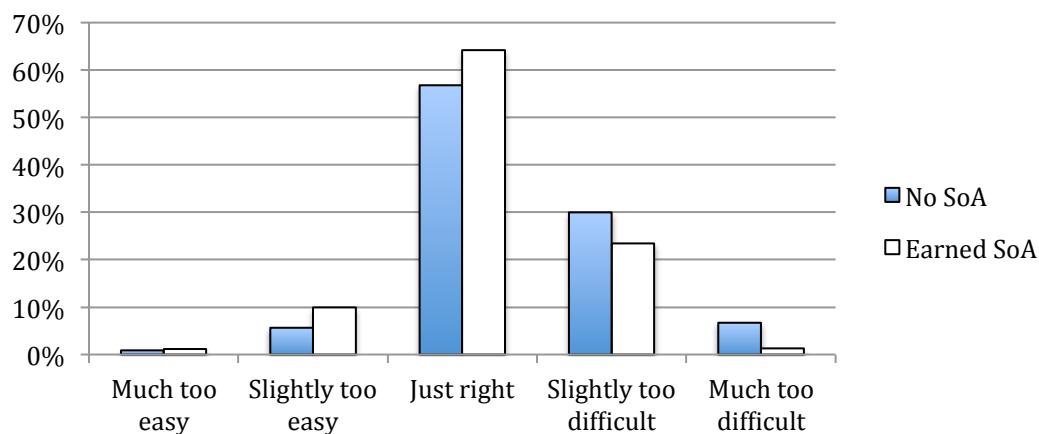


Fig. 9. Rating of Pace

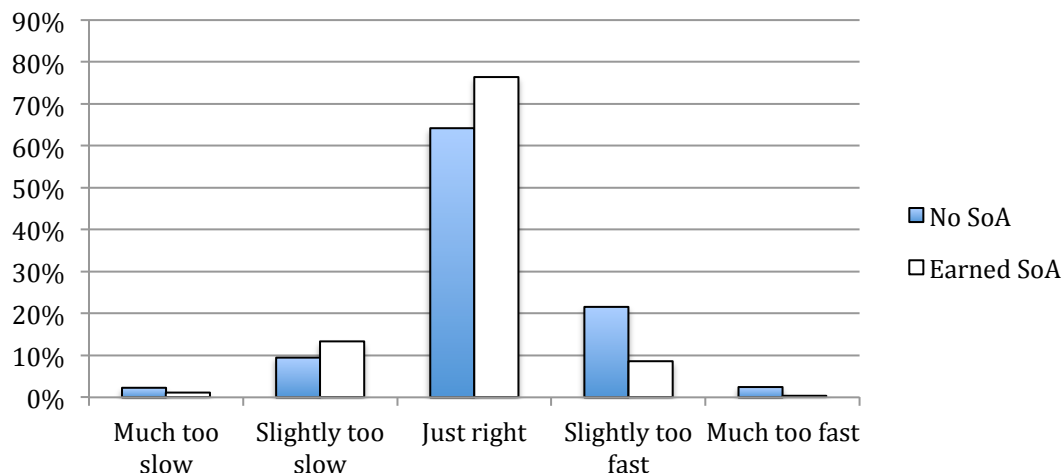
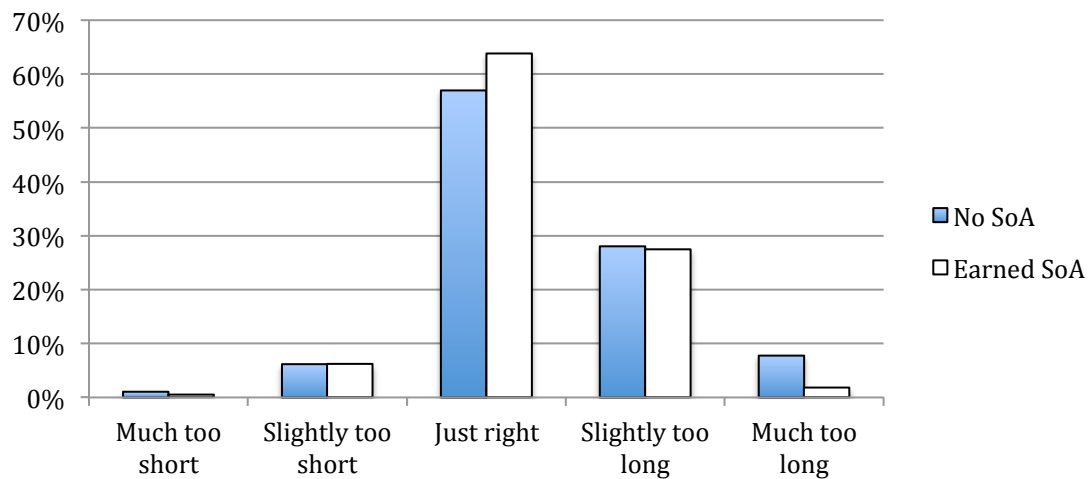


Fig. 10. Rating of Course Length



Evaluation of the Instructors

Students rated the instructors positively with 86% agreeing or strongly agreeing that the instructors enhanced their understanding of the material. Seventy-nine percent of respondents agreed that they would take another course from these instructors. Finally, students made very positive comments about the course and instructors in the open-ended “Additional Comments” section at the end of the survey. Some of these comments include:

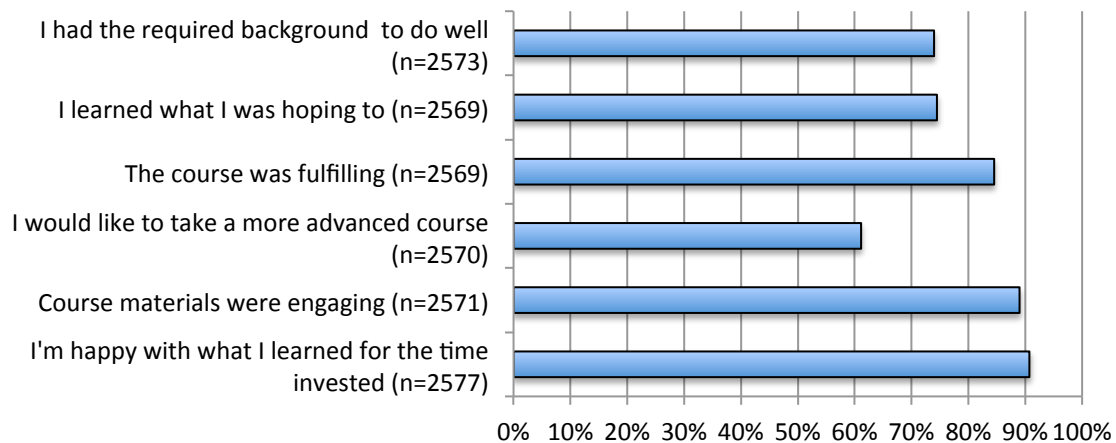
- “This was an excellently taught course, that greatly expanded my understanding of argument forms and method.”
- “Dear Walter Sinnott-Armstrong and Ram Neta, thank you very much for such interesting, informative lectures. I had real fun working with you.” and
- “Walter was the best professor I have ever had! He was hilarious and made each lecture completely engaging.”

The two instructors varied from each other with regard to presentation style and video quality. Students provided comments that indicated their preferences and perceptions of effectiveness of each instructor’s style and videos. This feedback informed changes that were made to improve the second offering of the course for Fall 2013.

Course Experience Relative to Student Expectations

Students answered questions probing the extent to which their experiences were satisfying relative to their expectations. Between 60% and 90% of respondents agreed or strongly agreed that they were satisfied with the course with regard to the issues listed in Figure 11.

Fig. 11. Student Satisfaction with Course



Sample Comments from Students

Students generated huge numbers of comments regarding their opinions of the course on both the forum and in the open-ended section of the post course survey. These comments were largely positive with some criticisms and suggestions for improvements. Below is a sample of these comments grouped thematically.

The majority of the *Additional Comments* students made in the post-course survey expressed general appreciation to the instructors for the course. This is exemplified by the following quotes:

- “Well done! Extremely stimulating course, and I already think and speak a little differently as a result of taking it. Thank you!!”
- “This was a wonderful experience. My 12-year-old son watched the first two or three lectures with me and then begged me to allow him to have his own Coursera account so he could actively follow in the course. He got a certificate with distinction, only 2 percentage points below my own, and we have shared both giggles and discussions over the lectures and quizzes.”
- Walter and Ram also received an email letter enthusiastically thanking them for the course from a member of an Iranian *Think Again* study group.

Many of the comments focused on the instructor’s teaching style. These include:

- “The rapport between Dr. Sinott-Armstrong and Dr. Neta and their senses of humor made the lectures engaging and enjoyable. Their passion for the subject was apparent and they were patient and thorough in their explanations.”
- “The professors did wonderful job. Walter and Ram played brilliantly and performed at the lectures in a very engaging manner. Their teaching styles are complimentary one to another. The information was structured very well. I really enjoyed the course and will recommend it to my colleagues and students. Thank you so much!”

Students also reported on how the course has benefitted them.

- "...but somehow I realized that, even though I seemed to be thinking all the time, I hadn't been doing *this* type of thinking for quite some time...so, thanks!"
- "This Course helped me a lot in my Discrete Mathematics Post Grad Class."
- "It was absolutely the most difficult non-technical course I took on Coursera, I managed to get 88% and am extremely happy about."

Some students indicated that they were encouraged to take other MOOCs as a result of taking this course.

- "This was my first course on Coursera and I am now encouraged to sign up for more."

Some students indicated that they would take other MOOC offerings from Duke because of their positive experience with *Think Again*.

- "This course left me with a very, very favorable impression about Duke as an institution and I browsed the other Duke offerings and am taking English Writing, Irrationality and Sports next month. Big tick to Walter, Ram, and Duke as a whole."

A small number of respondents indicated dissatisfaction with the quizzes.

- "I think the professors are aware of some of the glitches that need to be addressed (mis-graded quiz questions, quiz material not covered adequately in the lectures). Otherwise, this was an excellent course that speaks well for both Coursera and Duke."
- "It would be useful to have more exercises to prepare for the graded quizzes. I felt there was too much of a gap between the practice exercises offered with the lectures and the graded tests."

A few students also indicated that the quality of some of the video lectures needed to be improved.

- "While I did not have any problem following the video presentations a bit of improvement in the production standards might help. For instance Ram's movement towards and away from the camera while he was making whiteboard presentations and the resulting camera refocusing was a bit distracting. Some of Walter's annotations on written text were a bit hard to follow."

A few students also commented on the difficulty of the course.

- "You lost me at truth tables. While I understood general concepts, it quickly became too complex. I would have appreciated a shorter course and more practical application of materials."

A very small number of people had complaints about the forums.

- "I have to say, the forums are an inefficient tool for finding useful help. There's SO MUCH garbage in there, and I just don't have time to wade through it. The cream doesn't always rise to the top."

Instructor Insights

- The instructors changed the structure of the forums partway through the course to include threads on specific lectures. The TA for the course found that this helped focus the discussions. The TA expressed interest in exploring forum structure further, with a view to promoting topic-focused discussion and minimizing off-topic comments.
- Professors Sinnott-Armstrong and Neta both noted that students appreciated instructor participation in the forums. Professor Neta hopes to be more active in the forums in future iterations of the course.
- Based on forum posts, emails and post-course survey comments, Professor Sinnott-Armstrong learned that his use of humor in the lectures was effective in keeping students attentive.
- The audio and video quality of lectures varied. The instructors felt that those video lectures with good audiovisual quality were more successful teaching tools than those with poorer quality. Both Professor Sinnott-Armstrong and Professor Neta intend to reshoot or modify about half of the videos for the second offering of the course. They plan to clarify content, break content into shorter lectures, and improve the audiovisual quality of some of the lectures.
- The instructors plan to revise and expand homework practice exercises linked with each of the lectures. Professor Neta felt that students would benefit from more practice conducted more frequently. Professor Sinnott-Armstrong plans to use fewer true/false questions in these exercises and to offer more multiple-choice questions instead.
- Professor Sinnott-Armstrong intends to offer more detailed explanations of answers to the practice exercises and for-credit quizzes in an attempt to minimize student confusion.
- Professor Sinnott-Armstrong is extensively restructuring the Duke on-campus version of *Think Again*, in the context of pedagogical experimentation. Both he, and Professor Neta intend to "flip" their on-campus classes by using the Coursera video lectures and incorporating other materials developed for the MOOC.

"Even in courses that do not use my MOOC, I plan to include quizzes every 10 minutes in all of my lecture courses."

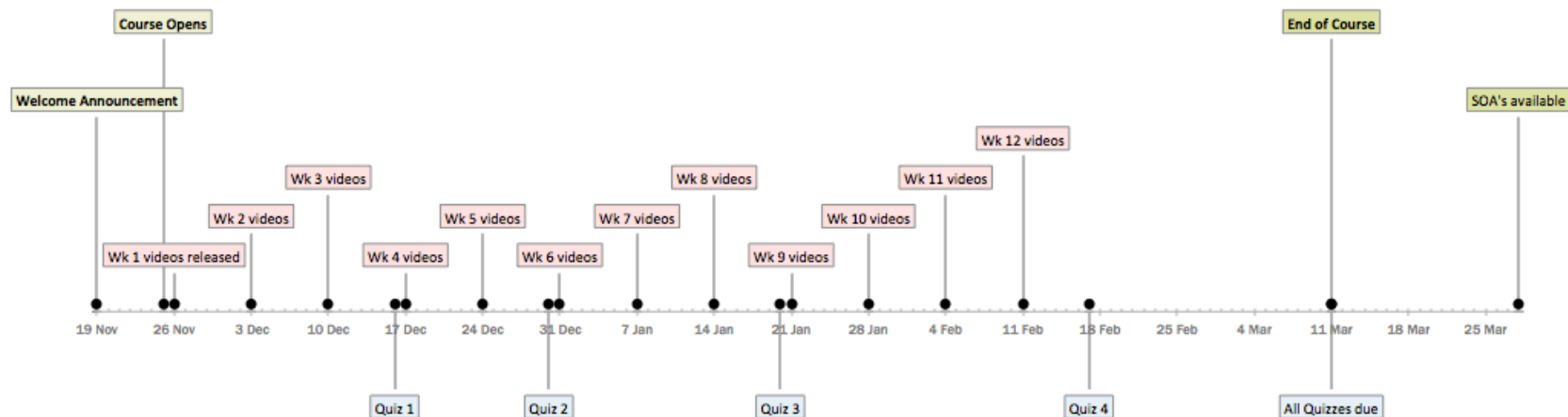
- Walter Sinnott-Armstrong

Overall Conclusions

1. In general, students and instructors both thought that *Think Again* was a successful course, especially considering that it was the first time it was presented in this format.
2. The instructors plan to improve the course materials and offer the course again.
3. The instructors will also be using the materials created for this MOOC to revise their campus classes.

Appendix A. Timeline of Duke's *Think Again: How to Reason and Argue*, 2012-13

Timeline of Think Again



The diagram above illustrates the timeline of significant events for Duke's *Think Again* MOOC. On November 12, 2012 the course web site was opened to students, but the course officially opened on November 25 with a welcome announcement. The first set of videos was released on November 26 and the course ended on March 11. Students were required to submit all quizzes by the end of the course. Statements of Accomplishment were issued on March 28.

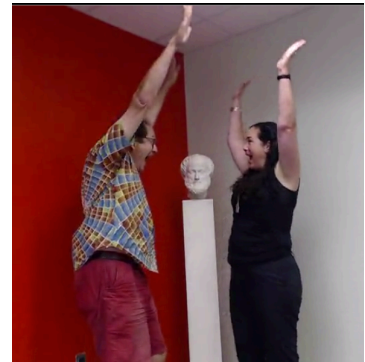
Appendix B. Course Syllabus

PART I: HOW TO ANALYZE ARGUMENTS

Week 1: How to Spot an Argument

This week's lectures will define what an argument is, distinguish various purposes for which arguments are given (including persuasion, justification, and explanation), and discuss the material out of which arguments are made (language). The last three lectures are optional honors lectures. READING: Understanding Arguments, Eighth Edition, Chapters 1-2.

- Lecture 1.1: Why Arguments Matter?
- Lecture 1.2: What is an Argument?
- Lecture 1.3: What Arguments are used for - Justification
- Lecture 1.4: What else are Arguments used for - Explanation
- Lecture 1.5: What are Arguments made of - Language
- Lecture 1.6: Meaning
- Lecture 1.7: Linguistic Acts
- Lecture 1.8: Speech Acts
- Lecture 1.9: Conversational Acts



Week 2: How to Untangle an Argument

This week's lectures will focus on the special language in which arguments are formulated. We will investigate the functions of particular words, including premise and conclusion markers, plausibly assuring, guarding, discounting, and evaluative terms. Identifying these words will enable students to separate arguments from the irrelevant verbiage that surrounds it and then to break the argument into parts and to identify what each part of an argument is doing. The lectures end with a detailed example that uses these tools to closely analyze an op-ed from a newspaper. READING: Understanding Arguments, Eighth Edition, Chapters 3-4.

- Lecture 2.1: Argument Markers
- Lecture 2.2: Standard Form
- Lecture 2.3: A Problem for Arguments
- Lecture 2.4: Assuring
- Lecture 2.5: Guarding
- Lecture 2.6: Discounting
- Lecture 2.7: Evaluation
- Lecture 2.8: Close Analysis
- Lecture 2.9: More Close Analysis
- Lecture 2.10: Even More Close Analysis

Week 3: How to Reconstruct an Argument

This week's lectures will teach students how to organize the parts of an argument in order to show how they fit into a structure of reasoning. We work through the main steps of reconstruction, including putting the premises and conclusion into a standard form, clarifying the premises and breaking them into parts, arranging the argument into stages or sub-arguments, adding suppressed premises where needed to make the argument valid, and assessing the argument for soundness. The lectures begin by defining the crucial notions of validity, soundness, and standard form. Students also learn to diagram alternative argument structures, including linear, branching, and joint structures. **READING:** Understanding Arguments, Eighth Edition, Chapter 5.

Lecture 3.1: Validity
Lecture 3.2: Soundness
Lecture 3.3: Get Down to Basics
Lecture 3.4: Sharpen Edges
Lecture 3.5: Organize parts
Lecture 3.6: Fill in Gaps and Conclude
Lecture 3.7: An Example of Reconstruction

PART II: HOW TO EVALUATE DEDUCTIVE ARGUMENTS

Week 4: Propositional Logic and Truth Tables

This week's lectures will present propositional logic, which formalizes external relations between whole propositions or sentences in deductive arguments. Topics include negation ("not"), conjunction ("and"), disjunction ("or"), and conditionals ("if..., then ..."). Students will learn to test arguments for validity using truth tables. **READING:** Understanding Arguments, Eighth Edition, Chapter 6.

Lecture 4.1: Intro to Deductive Arguments
Lecture 4.2: Propositions and Propositional Connectives
Lecture 4.3: Truth Functional Connectives Conjunction
Lecture 4.4: Truth Functional Connectives Disjunction
Lecture 4.5: Propositional Logic Negation
Lecture 4.6: Propositional Logic Conditionals

Week 5: Categorical Logic and Syllogisms

This week's lectures will present categorical logic, which formalizes some deductive relations that depend on internal features of propositions or sentences in deductive arguments. Topics include the four basic categorical forms, contradictory and contrary propositions, existential commitment, immediate inferences, and syllogisms. Students will learn to test arguments for validity using Venn diagrams. **READING:** Understanding Arguments, Eighth Edition, Chapter 7.

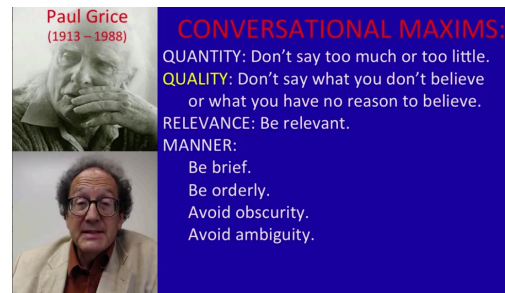
Lecture 5.1: Intro to Categorical Logic
Lecture 5.2: Syllogisms

PART III: HOW TO EVALUATE INDUCTIVE ARGUMENTS

Week 6: Inductive Arguments

This week's lectures will distinguish inductive arguments from deductive arguments and then discuss four common forms of inductive argument: generalizations from samples (such as in political polls), applications of generalizations to particular cases (such as in predicting weather on a certain day), inferences to the best explanation (such as in using evidence to determine who committed a crime), and arguments from analogy (such as in identifying the use of one archaeological artifact by comparing it to other artifacts). We will expose the most common mistakes in these kinds of reasoning. READING: Understanding Arguments, Eighth Edition, Chapter 8 and 10.

Lecture 6.1: What is Induction?
Lecture 6.2: Generalizations from Samples
Lecture 6.3: When are Generalizations Strong?
Lecture 6.4: Applying Generalizations
Lecture 6.5: Inference to the Best Explanation
Lecture 6.6: Which Explanation is Best
Lecture 6.7: Arguments from Analogy



Week 7: Causal Reasoning

This week's lectures will focus on how to decide what causes what. Students will learn how to distinguish necessary conditions from sufficient conditions and how to use data to determine what is and what is not a necessary condition or a sufficient condition. Then we will distinguish causation from correlation (or concomitant variation) and explain the fallacy of post hoc ergo propter hoc. READING: Understanding Arguments, Eighth Edition, Chapter 9.

Lecture 7.1: Causal Reasoning
Lecture 7.2: Sufficient Condition Tests
Lecture 7.3: Necessary Condition Tests
Lecture 7.4: Complex Conditions
Lecture 7.5: Correlation vs. Causation

Week 8: Chance and Choice

This week's lectures will cover chance and choice. Students will learn about the nature and kinds of probability and four simple rules for calculating probabilities. An optional honors lecture will explain Bayes' theorem. Next we will use probabilities to evaluate decisions by figuring their expected financial value and contrasting financial value with overall value. READING: Understanding Arguments, Eighth Edition, Chapters 11 and 12.

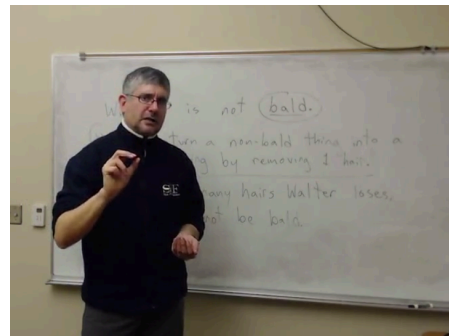
Lecture 8.1: Why Probability Matters?
Lecture 8.2: What is Probability?
Lecture 8.3: Rules of Probability for Negations
Lecture 8.4: Rules of Probability for Conjunctions
Lecture 8.5: Rules of Probability for Disjunctions
Lecture 8.6: Rules of Probability for Series
Lecture 8.7: Bayes' Theorem
Lecture 8.8: Expected Financial Value
Lecture 8.9: Expected Overall Value

PART IV: HOW TO MESS UP ARGUMENTS

Week 9: Fallacies of Unclarity

This week's lectures will define fallacies as common but tempting mistakes in argument. Then we will explore two very common kinds of fallacies that depend on unclarity in language — specifically, slippery slope arguments that depend on vagueness and equivocations that exploit ambiguity. The lectures will close by distinguishing several kinds of definitions that can help to avoid or respond to fallacies of unclarity. READING: Understanding Arguments, Eighth Edition, Chapters 13 and 14.

Lecture 9.1: Paradoxes of Vagueness
Lecture 9.2: Fallacies of Vagueness
Lecture 9.3: Fallacies of Ambiguity



Week 10: Fallacies of Relevance and of Vacuity

This week's lectures will look at fallacies in which the premises are irrelevant to the conclusion, or in which the premises cannot be reasonably accepted before we have reasonably accepted the conclusion. The first group includes arguments ad hominem and fallacious appeals to authority, to emotion, and to ignorance. The second includes begging the question, but we will also discuss various ways in which people seal their positions to make them immune to any

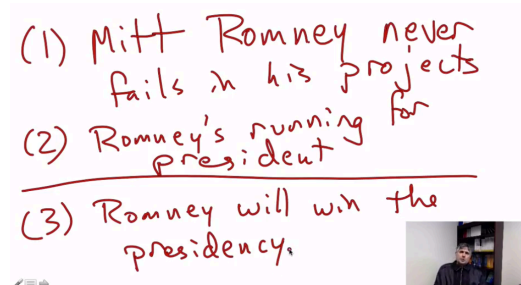
possible counterexample. This apparent virtue turns out to be a vice. READING: Understanding Arguments, Eighth Edition, Chapters 15 and 16.

- Lecture 10.1: Fallacies of Relevance: Ad Hominem
- Lecture 10.2: Fallacies of Relevance: Appeals to Authority
- Lecture 10.3: Fallacies of Relevance: Examples of Appeals to Authority
- Lecture 10.4: Fallacies of Relevance
- Lecture 10.5: Fallacies of Vacuity: Begging the Question
- Lecture 10.6: Circularity and Self-Sealers

Week 11: Refutation

Not all objections to arguments succeed in refuting those arguments, so this week's lectures begin by distinguishing objections from refutations. One way to refute an argument is to show that its premises are false, so we will discuss counterexamples and reductio ad absurdum arguments. Another way to refute an argument is to show that its premises do not support its conclusion, which can be accomplished by a method called refutation by parallel reasoning (or "That's just like arguing ..."). The method is a general way to spot fallacies. This closing week brings us back to a theme of the first week, because refutation is another purpose of argument in addition to persuasion, justification, and explanation. READING: Understanding Arguments, Eighth Edition, Chapter 17.

- Lecture 11.1: Counter Examplng
- Lecture 11.2: Refutation: Reductio ad Absurdum
- Lecture 11.3: Refutation: Straw Man
- Lecture 11.4: Refutation: False Dichotomy
- Lecture 11.5: Parallel Reasoning
- Lecture 11.6: Straw Man



Week 12: Applications

In this final week, we will consider examples of arguments from everyday life, and figure out whether those arguments are successful. In particular, we will consider arguments concerning issues of public policy, public health, and legal questions. We will conclude by considering some arguments that bear on the issue of whether humans have free will.

- Lecture 12.1: Constructing your own Arguments
- Lecture 12.2: Strong Arguments don't always Persuade
- Lecture 12.3: Arguments for Vegetarianism
- Lecture 12.4: Who Broke the Dish?

Lecture 12.5: The Sausage Argument
Lecture 12.6: Ram's Lecture Series Requires a Mental Health Warning
Lecture 12.7: .999 is Equal to 1
Lecture 12.8: Babies are Evil
Lecture 12.9: I am Nobody
Lecture 12.10: Monogamy is an Obsolete Concept
Lecture 12.11: Gay Sex, Human Nature, and Benefits
Lecture 12.12: The Perception of Color