# CRITICAL THINKING Lecture #O





Course Introduction

Professor David Emmanuel Gray







# All roses are flowers, and some flowers fade quickly. Therefore, some roses fade quickly.

Is this a logically valid argument? In other words, does the conclusion of this argument logically follow from the premises?



2



If science can prove that God is dead, then God is dead. But science cannot prove that God is dead. Therefore, God is not dead.

Is this a logically valid argument? In other words, does the conclusion of this argument logically follow from the premises?





If the moon is made out of green cheese, then I'm a monkey's uncle. The moon is made out of green cheese!? So it would appear that I'm a monkey's uncle.

Is this a logically valid argument? In other words, does the conclusion of this argument logically follow from the premises?







# Course Requirements

# Final Exam (25%)

# Participation (10%)



**11 Quizzes (20%)** (Lowest 3 Dropped)

# 3 Unit Exams (45%)



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#### Image: [Crowded classroom], 2012.



# ABSENCES & LATE ARRIVALS

Image: TheOnlySilentBob, 2008.



# EXPERIENTIAL LEARNING



# TAKE NOTES!

Image: [Taking notes], n.d.



# TAKE RISKS

Image: [Rothman, Starkey, Zemeckis, Rapke, & Zemeckis, 2015.

no.





# EARNI

Image: RichVintage, 2014.



#### **Problem Set #1:** Statement Classification

Although I strongly suggest that you write out answers to all these problems, you do not have to turn in any written responses. You do, however, need to be prepared to do these types of problems, for questions on the weekly quizzes and exams will primarily be drawn from the problem sets. The solutions to these problems will be provided, so you can check your own work and seek help from me as necessary.

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#### Instructions

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#### Problems

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- Most sophomores do not hate logic. 3
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- The seniors know logic and the professor has an easy job. 5.
- Either the juniors will not enjoy logic or they will have fun. 6.
- The juniors certainly do enjoy logic. 7.
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- If the juniors do not love logic, then the professor is sad. 9.
- 10. Either the professor is sad, or if his students are engaged in the class then the professor is happy.
- 11. If the seniors learn logic and the professor has an easy life, then the world is a better place.
- 12. If sophomores know logic and they get better jobs, then either their lives are easy or they will make lots of money.
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- 7. Mr. Omar is the pilot's neighbor.

**Question:** Who holds each position?

This guestion has a definitive right answer that can be fully justified without any guessing.

# 13 problem sets, one every week. They are not collected, not graded.





#### 80-208 Fall 2017 Carnegie Mellon University

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#### **CRITICAL THINKING**

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#### Solutions

- All the seniors know logic. Simple positive.
- 2. Some professors hate logic.
  - Simple positive.
- Most sophomores do not hate logic. 3.

#### Simple negative.

4. Either the seniors or the sophomores know logic.

Compound disjunctive, where The first disjunct is simple positive, and The second disjunct is simple positive.

5. The seniors know logic and the professor has an easy job.

Compound conjunctive, where The first conjunct is simple positive, and The second conjunct is simple positive.

6. Either the juniors will not enjoy logic or they will have fun.

Compound disjunctive, where The first disjunct is simple negative, and The second disjunct is simple positive.

7. The juniors certainly do enjoy logic.

#### Simple positive.

8. The seniors know logic and the sophomores are jealous.

Compound conjunctive, where The first conjunct is simple positive, and The second conjunct is simple positive.

9. If the juniors do not love logic, then the professor is sad.

Compound hypothetical, where The antecedent is simple negative, and The consequent is simple positive.

- 11. If the seniors learn logic and the professor has an easy life, then the world is a better place.
  - Compound hypothetical, where The antecedent is compound conjunctive, where The first conjunct is simple positive, and The second conjunct is simple positive; and The consequent is simple positive.
- 12. If sophomores know logic and they get better jobs, then either their lives are easy or they will make lots of money.
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- If the seniors like logic then the professor is not sad, and if the 13. professor is not sad then his wife is happy.

Compound conjunctive, where

The first conjunct is compound hypothetical, where The antecedent is simple positive, and The consequent is simple negative; and The second conjunct is compound hypothetical, where The antecedent is simple negative, and The consequent is simple positive.

14. If the seniors either have easy lives or make lots of money, then the sophomores are jealous.

Compound hypothetical, where The antecedent is compound disjunctive, where The first disjunct is simple positive, and The second disjunct is simple positive; and The consequent is simple positive.

15. If the sophomores not knowing logic would cause the professor to be sad, then the world is a sad place for the professor.

Compound hypothetical, where The antecedent is compound hypothetical, where The antecedent is simple negative, and The consequent is a simple positive; and The consequent is simple positive.

Please Note: When solving these types of problems for a quiz or an exam, you are expected to format your own solutions in a similar manner

10. Either the professor is sad, or if his students are engaged in the

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# Solutions will be provided.





#### **Problem Set #1:** Statement Classification

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- 7. Mr. Omar is the pilot's neighbor.

**Question:** Who holds each position?

This question has a definitive right answer that can be fully justified without any guessing.

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Course Website

Please visit the course website regularly: http://www.ondrew.cmu.edu/user/degray/CT17/ It will have the course schedule, all readings (there is no textbook), problem sets, lecture slides, and all other course materials. C

80-208 Fall 2017

# Critical Thinking

#### **Course Information**

Instructor	Professor David Emmanuel Gray
Contact	CMUQ 1039, degray@cmu.edu, @ProfessorDEG
Office hours	Whenever the instructor's door is open
Class time	Sunday, Tuesday, Thursday: 4:30pm–5:20pm
<b>Class location</b>	CMUQ 1064
Syllabus	<u>PDF</u> .

#### Grading

•	Participation	10%
•	13 Problem Sets	
•	11 Quizzes	20%
	(Lowest 3 are dropped.)	
•	3 Unit Exams	45%
•	Final Exam	25%

Grade Calculator (Excel)

#### Schedule

Date	Topic/Readings	Assignments
8/20 (Sun)	Course Introduction (slides)	Problem set #1 (solutions), and Logic puzzle #1 sample solutio
8/22 (Tue)	What is an Argument? (Unit #1) ( <u>slides</u> ) Copi & Cohen, <u>"What Logic Is"</u> . Copi & Cohen, <u>"Propositions and Arguments"</u> .	
8/24 (Thu)	What is an Argument? ( <u>slides</u> ) Workshop on statement classification.	
8/27 (Sun)	What is an Argument? (slides) Vaughn, <u>"Claims and Reasons"</u> . Vaughn, <u>"Reasons and Arguments"</u> .	<b>Quiz #1</b> , and <u>Problem set #2</u> ( <u>solutions</u> ).
8/29 (Tue)	What is an Argument? (slides) Vaughn, <u>"Arguments in the Rough"</u> .	
8/31 (Thu)	What is an Argument? (slides) Workshop on argument parsing.	
9/3–7	🍸 Eid Al-Adha Break 🌴	<b>\$ \$ \$ \$ \$ \$</b>
9/10 (Sun)	Understanding an Argument (Unit #2) (slides) Vaughn, <u>"Diagramming Arguments"</u> .	<b>Quiz #2</b> , and <u>Problem set #3</u> (solutions).
9/12 (Tue)	Understanding an Argument (slides) Copi & Cohen, <u>"Diagramming Arguments"</u> .	



# THANK YOU GOOGLE, WIKIPEDIA, CUT-AND-PASTE, THE BABY JESUS, AND MOM







### **NO LAPTOPS**



## **NO PHOTOGRAPHY**

Images (clockwise from top-left): Sketch2SVG, n.d.; Kimmi Studio, n.d.; Najdenovski, n.d.; Artemova, n.d.

# ATTENTON



## **NO PHONES**



## **NO RECORDING**



# Introductory Extra Credit Opportunities

(I emailed the link out last week.) Let me know if you did not get that email.

class on Tuesday, August 22<sup>ND</sup> at 4:30PM.

floor.

- Extra credit I: Fill out the survey on Google Forms by tonight, Sunday, August 20<sup>TH</sup>, at 10:00PM.
- Extra credit 2: Read the Academic Honor Code for Business, Society, and Ethics (on page 7 of the syllabus), then sign and return the Honor Agreement to me before the beginning of next

Extra credit 3: Come introduce yourself to me at my office sometime before this Thursday, August 24<sup>TH</sup> at 4:00PM. My office is 1039, right next to the men's prayer room on the ground

#### 28





Next Class...

We begin our study of informal logical reasoning by looking at the basic building blocks of arguments: statements.

Make sure you visit the course website so that you can download this week's problem set as well as the reading you are expected to have done before next class.





#### References

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#### Acknowledgements

A special thanks to A. R. W. Cheek for designing the slide with the Raphael (1511/2013) image, which was part of a CSR Majlis workshop on business ethics we conducted for Vodafone Qatar on April 24, 2016. The slide on academic integrity is based on various memes associated with "My Graduation Speech" (n.d.).

My Graduation Speech. (n.d.). Retrieved August 9, 2017 from https://me.me/t/my-graduation-speech.

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