# University of Waterloo Department of Philosophy PHIL 145(001) Critical Thinking Fall 2016 MWF 11:30am–12:20 pm STC 0010

## Instructor and T.A. Information

Instructor: Ted Richards

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| Tutorial |  |  |

## Course Description

We spend much of our lives thinking. But do we think about how we’re thinking? In this course you will come to a better understanding of the strengths and weaknesses of your own reasoning, and that of other people. You will learn techniques for recognizing and avoiding unreliable reasoning, both in the public medium of communication, and in thinking about your own judgements, experiences and attitudes. These skills will prove valuable to reasoning in academic, professional, practical and personal contexts.

## Course Goals and Learning Outcomes

By the end of the course, you will have enhanced your abilities to:

1. identify, classify, and clearly articulate reliable and unreliable forms of reasoning;
2. recognize and evaluate reasoning about evidence, including using some central concepts of statistics and probability;
3. identify and predict the cognitive and social factors that make oneself and others susceptible to common reasoning errors;
4. interpret evidence and problem-solve more effectively;
5. critically examine both scientific reasoning and popular presentations of scientific evidence;
6. appraise and interpret corporate media and other main sources of information, in order to assess under what conditions they might be unreliable; and,
7. develop both the skills and habits of appraising one’s own likely biases, and minimizing their negative effects on reasoning.

## Required Texts

• Creating Scientific Controversies. David Harker. Cambridge University Press. 2015.

• How to Lie with Statistics. Darrell Huff. W. W. Norton & Company. 1993.

## Course Requirements and Assessment

Students may receive feedback on elements of both ungraded and graded work, including through in-class sample questions and consultation with teaching assistants. The course grade itself has three components, with some flexibility in order for improvement over the course to be reflected in the overall grade.

| Assessment | Date of Evaluation (if known) | Weighting |
| --- | --- | --- |
| Chapter Quizzes | Date of Evaluation 1 | 10% |
| Exams | Date of Evaluation 2 | 50% (or 45%) |
| Final Exam | Date of Evaluation 4 | 40% (or 45%) |
| Total |  | 100% |

The percentage for the midterm and final will be in your favour. For example, if you score higher on the exams than the final, then the exams are worth 50% and the final 40%.

### Assessment 1

Chapter will cover one chapter's worth of material. They will multiple choice, will be administered on Learn, will be open note and open book, but will be timed. You will have one opportunity to complete the quiz. No late quizzes will be allowed.

### Assessment 2

Exams will cover material not previously covered by an exam. For example, Exam 2 will be on Harker chapters 5-7. Exams will be administer is class, on paper, closed note and closed book. Students need only bring a writing implement and a spare writing implement, and their ID.

### Assessment 3

The final examination is cumlative, administered on paper, closed note and closed book. Students need only bring a writing implement and a spare writing implement, and their ID. Note: According to the Policy stated by the Registrar, 'student travel plans are not acceptable grounds for granting an alternative final examination time.' The final exam time will be announced and posted as soon as it is available. The final exam period is Dec 8-22.

Other information:  
• On paper examinations may contain these elements:

1. Multiple choice
2. Fill in the blank
3. Definition
4. Short answer
5. Paragraph or multi-paragraph answer
6. Analysis of an example

There won’t be anything tricky or sneaky—just questions asking you to explain and apply what we’ve covered in class and in the readings.

## Course Outline (Tentative Schedule)

| **Date** | **Topic** | **Readings Due** |
| --- | --- | --- |
| Sept 9 | Introduction | Syllabus |
| Sept 12 | Intro to Harker | Harker, Introduction |
| Sept 14, 16 | Defining Science | Harker, Ch 1 |
| Sept 19, 21 | Naïve Empiricism | Harker, Ch 2 |
| Sept 23, 26 | A Revolution | Harker, Ch 3 |
| Sept 28, 30 | Socially Situated Science | Harker, Ch 4 |
| Oct 3 | Review |  |
| Oct 5 | Exam 1 |  |
| Oct 7, 14 | Biases and Heuristics | Harker, Ch 5 |
| Oct 19, 21 | Arguments | Harker, Ch 6 |
| Oct 24, 26 | Controversies | Harker, Ch 7 |
| Oct 28 | Review |  |
| Oct 31 | Exam 2 |  |
| Nov 2,4 | Climate Change | Harker, Ch 8 |
| Nov 7,9 | Intelligent Design | Harker, Ch 9 |
| Nov 11, 14 | Public Health | Harker, Ch 10 |
| Nov 16 | Review |  |
| Nov 18 | Exam 3 |  |
| Nov 21 | Intro and Sampling | Huff, Intro & Ch 1 |
| Nov 23 | Averages and Missing Numbers | Huff, Chs 2&3 |
| Nov 25 | Practically Nothing and Graphs | Huff, Chs 4&5 |
| Nov 28 | Pictures and Figures | Huff, Chs 6&7 |
| Nov 30 | Post Hoc and Statistculation | Huff, Chs 8&9 |
| Dec 2 | Talking Back to a Statistic | Huff, Ch 10 |
| Dec 5 | Exam 4 |  |

## Late Work

All assignments will be completed on Learn or in class. No late work will be accepted without previous arrangement or documentation of an incident that warrants exception.

## Electronic Device Policy

Electronic devices will be allow in lectures so long as they are not disruptive to the rest of the class. This means, at a minimum, cell phones must be made silent during lecture time. The instructor reserves the right to ban and/or confiscate electronic devices if they become disruptive.

## Attendance Policy

Attendance is highly recommended, but not required. Students will, however, be held responsible for all material covered in lecture.

## Institutional-required statements for undergraduate course outlines approved by Senate Undergraduate Council, April 14, 2009

### Academic Integrity

In order to maintain a culture of academic integrity, members of the University of

Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. See the [UWaterloo Academic Integrity Webpage (https://uwaterloo.ca/academic-integrity/)](http://www.uwaterloo.ca/academicintegrity) and the [Arts Academic Integrity Office Webpage (http://arts.uwaterloo.ca/current-undergraduates/academic-responsibility)](http://arts.uwaterloo.ca/current-undergraduates/academic-responsibility) for more information.

### Discipline

A student is expected to know what constitutes academic integrity to avoid committing academic offenses and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to [Policy 71, Student Discipline (http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm)](http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm). For typical penalties check [Guidelines for the Assessment of Penalties (http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm)](http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm).

### Grievance

A student who believes that a decision affecting some aspect of his/her university life has been

unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm) (https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70). When in doubt please be certain to contact the department’s administrative assistant who will provide further assistance.

### Appeals

A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to [Policy 72, Student Appeals (http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm)](http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm).

### Note for Students with Disabilities

The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.