This syllabus is provisional and is subject to change.

REASONING AND RATIONAL DECISION MAKING PHIL1250-001 Fall 2019
Instructor: Stephen M. Downes
Email: s.downes@utah.edu
Office Hours: Thursdays 2.00 to 3.00pm and by appointment
Office Location: 457 CTIHB
Preferred Method of Contact: Via email
TA: Derek Halm
Office Hours: TBA
Email: Derek.Halm@utah.edu
Course Location: BU C 107
Class meets Tuesday/Thursday 9:10a-10:30a

CATALOGUE DESCRIPTION
Analyzing and evaluating arguments, basic logical framework, Aristotelian logic and beginning logic of sentences, fallacies, fundamentals of probability, decision theory, and game theory.

COURSE DESCRIPTION
Is what that politician said supported by evidence? Should I buy a lottery ticket? Does the result of one coin toss tell me anything about the result of a future coin toss? Which of driving drunk or texting while driving is riskier behavior? Does this letter to the editor present adequate support for its conclusion? What does this sample tell us about the population as a whole? Should I check if this cannon is working by putting my head in the barrel?
We reason to conclusions all the time, even when we are unaware that is what we are doing. We draw conclusions and act upon our conclusions every few seconds of every day. When we are driving, we make inferences all the time based on the evidence available to us about signals, lights, pedestrians and other cars. We also, again often almost unconsciously, check other people’s reasoning: Why does so and so believe that given the evidence? For example, why believe that your losing team is going to win this time?
In PHIL1250, Reasoning and Rational Decision Making, students develop a better understanding of human reasoning and learn to be better reasoners themselves. We will find that there are methods and approaches that, if applied correctly, allow us to reason better. We will learn to; distinguish valid from invalid arguments; use probability to assess the strength of evidence and the strength of predictions; and apply methods for improving our decision making. We will give answers to the following questions: What does it mean to reason well? What sorts of things can be reasonable (beliefs, hypotheses, decisions, etc.)? What are the standards of good reasoning? Do humans typically meet these standards?

COURSE OUTCOMES
By the end of this course and successful completion of all course requirements, the student will be able to do all of the following:
• explain the importance and relevance of the study of formal logic to human reasoning,
• compare and contrast philosophical accounts of what it means to reason well, showing how they relate to one another and pointing to their strengths and weaknesses,
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- display an understanding and working knowledge of the formal logics that we cover,
- display an improved ability to construct, clarify, and evaluate arguments encountered in the real world.

**COURSE MATERIALS**
- [Amazon] [Campus Store]
- You must have the 9th edition of this and make sure you get the Concise edition.

Additional Readings on Reserve.
Turning Technologies Response device ("clicker").
- Available for purchase at the Campus Store. Students must register their clicker for this course online before using it in Follow the registration instructions on our CANVAS site.

**COURSES REQUIREMENTS**
I do not accept any late assignments. This requirement is negotiable only under circumstances of illness or injury that are brought to my attention before the assignment is due. If an assignment is not handed in by the due date it will receive a failing grade. The dates for handing in homework will be built into Canvas' assignment page. There will also be no make-up exams. *Take a careful look at the syllabus and make sure you can attend all exams before committing to signing up for this class* (Exam 1 is Oct 17th; Exam 2 is Nov 14th and the Final Exam is on Dec 11th at 8:00am)

**Attendance / Participation**
(20% of final grade)
Learning will come much more easily and enjoyably if you're actively participating in your education! Accordingly, I emphasize student participation and discussion in the classroom. I expect you all to bring questions, ideas, and insights to class and to be prepared to share them. Of course, if you're not attending class, then you're not participating well either; so, attendance is required. You can also enhance your participation by checking into Canvas regularly. This way you can keep up on class requirements and also find class slides from classes you missed or simply want to go over again. We will be doing problems in class and you will submit your answers using your clicker devices. Points will be assigned for all clicker participation.

**Homework**
(40% of final grade)
In order to make sure that you are doing the reading carefully and understanding the material, you will have weekly homework assignments. Assignments will be due online either via OLI or via Canvas, and *students may not work on their assignments during our class meetings*. Students may work together on HW, but each student actually needs to contribute. It should go without saying that students may not copy other
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students’ answers. Students who are struggling with HW should not hesitate to seek help. The best solution is to talk to your fellow classmates and try to work out issues together. The next best solution is to remember which problems you struggled with; we will want to go through these as a class during our meetings. Your homework score will be the total of each of your homework scores throughout the semester. You will receive no score if you miss a homework assignment. There will be no makeup homework assignments.

Exams
(40% of final grade — Exam 1: 10%; Exam 2: 10%; Final Exam: 20%)
Exams will cover significant ideas, principles, and methods treated in the course — i.e., those covered in the readings, homework, and especially in class times. We will spend one full class time reviewing the relevant material together before each exam. Check the course calendar and schedule for exam dates, times. All exams will be in our classroom (107 BU C).

GRADING POLICY

<table>
<thead>
<tr>
<th>Points translate to grades as follows:</th>
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<tbody>
<tr>
<td>93 and above                           = A</td>
</tr>
<tr>
<td>90-92                                  = A-</td>
</tr>
<tr>
<td>88-89                                  = B+</td>
</tr>
<tr>
<td>83-87                                  = B</td>
</tr>
<tr>
<td>80-82                                  = B-</td>
</tr>
<tr>
<td>78-79                                  = C+</td>
</tr>
<tr>
<td>73-77                                  = C</td>
</tr>
<tr>
<td>70-72                                  = C-</td>
</tr>
<tr>
<td>etc.</td>
</tr>
<tr>
<td>Below 60                               = E</td>
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Total 100

UNIVERSITY POLICIES

The Americans with Disabilities Act. The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

Addressing Sexual Misconduct. Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran’s status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and
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confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677 (COPS).

**University Safety Statement.** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

**Drop/Withdrawal.** Last day to Add/Drop this class: Friday Sept. 1st. Last day to withdraw from this class: Oct 21st

**University Policies and Procedures:**
Student Code: [http://regulations.utah.edu/academics/6-400.php](http://regulations.utah.edu/academics/6-400.php)(Links to an external site.)
Accommodation Policy (see Section Q): [http://regulations.utah.edu/academics/6-100.php](http://regulations.utah.edu/academics/6-100.php)(Links to an external site.)

**General Education Statement:** This course contributes to the University of Utah’s Quantitative Reasoning requirement. For such courses, academic units must identify three essential learning outcomes (ELOs) that are relevant to university general education objectives. The ELOs for this course are: Inquiry and Analysis, Quantitative Literacy and Foundations and Skills for Lifelong Learning.

**COURSE POLICIES**

**Attendance & Punctuality:** According to University policy, “Instructors must communicate any particular attendance requirements of the course to students in writing on or before the first class meeting” (PPM, Policy 6-100III-O)]. Attendance is mandatory in this class. Attendance will count for a portion of your participation grade. Points will be deducted for non-attendance.

**Participation:** A component of your grade will be based on participation. Participation includes contributions to in-class discussion, regular visits to the class Canvas site and contribution to discussions on the class site and discussion with the instructor in office hours.

**Food & Drink:** If you bring food or drinks to class, please tidy up and be respectful of your classmates.

**Electronic Devices in Class:** You may use a laptop or tablet to take notes on the lecture in class. You must also bring your response device (Clicker) to every class. Otherwise, no electronic devices may be used in class. If you use your laptop or tablet to check Facebook etc., play games or engage in other non-class activities you will be asked to turn those applications off. Repeat offenders will be asked to leave class.

**Canvas:** All information about this class will be posted on Canvas. Please consult the class Canvas page regularly. Your Canvas activity for each class is logged automatically. The system detects every time you log on and records how long you visited for. Your participation through Canvas is measured this way.

**Course Schedule**

**Week 1 (Aug 20 and 22)**
Course Introduction, Rationality & Arguments, Uses of Arguments
Reading: UA, ch. 1
Register clickers (instructions on CANVAS)

**Week 2 (Aug 27 and 29)**
Arguments in Everyday Language, Argument Evaluation
Reading: UA, ch. 3, pp. 79-89 (re-read UA Ch. 1)

**Week 3 (Sept 3 and 5)**
Extracting Arguments out of Everyday Language
Reading: UA, pp. 90-94

**Week 4 (Sept 10 and 12)**
Standards of Rationality, Formal Logic, Deductive Standards, Propositional Logic
Reading: UA, pp. 111-34

**Week 5 (Sept 17 and 19)**
Propositional Logic: Connectives, Truth Tables, Truth-Functionality, Logical Equivalence, Validity
Reading: UA, pp. 134-50;

**Week 6 (Sept 24 and 26)**
Limitations of Propositional Logic, Categorical Logic
Reading: UA, pp. 151-62

**Week 7 (Oct 1 and 3)**
Categorical Logic, Limitations of Deductive Logic
Reading: UA, pp. 162-75

**Week 8 (Oct 8 and 10)**
NO CLASSES all week — Fall Break!!

**Week 9 (Oct 15 and 17)**
Wrapping up Deductive Logic TEST WEEK
REVIEW SESSION: Tuesday
EXAM 1: Thursday, regular class time

**Week 10 (Oct 22 and 24)**
Deduction & Induction, Statistical Generalizations.
Reading: UA, pp. 179-93, 204-208, 213.

**Week 11 (Oct 29 and 31)**
Formal Inductive Logic, Probability Theory
Reading: UA, pp. 239-53.

**Week 12 (Nov 5 and 7)**
Probability Theory, Bayes's Theorem, Inductive Strength
Reading: UA, pp. 253-62.

**Week 13 (Nov 12 and 14)**
TEST WEEK
REVIEW SESSION: Tuesday
EXAM 2: Thursday, regular class time

**Week 14 (Nov 19 and 21)**
Rational Choice, decisions under risk, expected values
Reading: UA 263-268; Hacking, ch. 8 (available on CANVAS) The Hacking readings uses this symbol: \( \sum \) which means sum. As in \( \sum (1, 2, 3, 4, 5) = 15 \)

**Week 15 (Nov 26 and 28)** No class on Thursday: Thanksgiving
Decisions under ignorance, Pascal's Wager
Reading: UA 268-272; Hacking, ch. 9-10 (available on CANVAS) Recommended: SEP, “Pascal’s Wager”

**Week 16 (Dec 3 and 5)**
REVIEW SESSION: Tuesday: Deductive Logic
REVIEW SESSION: Thursday: Inductive Logic
Finals Week
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EXAM 3, FINAL: Wednesday Dec 11th 8.00am to 10.00am

Note: This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas under Announcements and in the Calendar.