161-201 Reasoning and Uncertainty

Credit Points:	12.50
Level:	2 (Undergraduate)
Dates & Locations:	This subject is not offered in 2009.
Time Commitment:	Contact Hours: A 2 hour lecture and a 1 hour tutorial per week Total Time Commitment: 3 contact hours/week, 5.5 additional hours/week. Total of 8.5 hours per week.
Prerequisites:	At least one first-year single-semester philosophy subject or permission from the Head of School or subject coordinator.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Contact:	Assoc Prof Greg Restall restall@unimelb.edu.au
Subject Overview:	The distinction between good and bad reasoning ought to apply whether we are certain of our premises or not. However, many of the important techniques in contemporary logic were developed to model the kinds of proof found in mathematical reasoning, where certainty seems available and proofs guarantee their conclusions. This subject examines the different kinds of reasoning appropriate where uncertainty is rife. It will consider techniques from among elementary probability theory, Bayesian decision theory, inductive inference, game theory, fuzzy logic, non-monotonic reasoning, default inference, dynamic logic and rational belief revision.
Objectives:	Students who successfully complete this subject will # learn to apply formal techniques in the handling of uncertainty; # acquire the ability to understand the benefits and pitfalls of representing content in symbolic form; # demonstrate the ability to present complex technical ideas intelligibly, both in written and oral form; # be able to critically examine philosophical arguments and theses; # learn to creatively apply different formal techniques for insight into philosophical problems.
Assessment:	A series of 7 exercises during the semester 49%, and a 2-hour end-of-semester examination 51%.
Prescribed Texts:	A subject reader will be available from the Bookroom at the beginning of semester An Introduction to Probability and Inductive Logic (Ian Hacking) Cambridge University Press, Cambridge (2001).
Recommended Texts:	Ernest W. Adams, *A Primer of Probability Logic*, CSLI Press, Stanford, 1998. Peter Gardenfors, *Knowledge in Flux: modeling the dynamics of epistemic change*, MIT Press, Cambridge. Peter Gardenfors and Nils-Eric Sahlin (editors), *Decision, Probability and Utility: selected readings*, Cambridge University Press, Cambridge (1986). Ian Hacking, *An Introduction to Probability and Inductive Logic,* Cambridge University Press, Cambridge (2001). Richard C. Jeffrey, *Probability and the Art of Judgment*, Cambridge University Press, Cambridge (1992). Isaac Levi, *The Fixation of Belief and its Undoing*, Cambridge

University Press, Cambridge (1991). Isaac Levi, *For the Sake of the Argument: Ramsey test conditionals, inductive inference and nonmonotonic reasoning*, Cambridge University Press, Cambridge (1996). John F. Nash, *Essays on Game Theory*, E. Elgar, Cheltenham (1996). Martin J. Osborne, *A Course in Game Theory*, MIT Press, Cambridge (1994). Jan von Plato, *Creating Modern Probability: its mathematics, physics and philosophy in historical perspective*. Cambridge University Press, Cambridge (1994).

Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Biomedicine (https://handbook.unimelb.edu.au/view/2009/J07)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2009/F04)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2009/A04)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2009/M05)** # **Bachelor of Science (https://handbook.unimelb.edu.au/view/2009/R01)** # **Bachelor of Engineering (https://handbook.unimelb.edu.au/view/2009/355-AA)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	Students who successfully complete this subject will # learn to master different formal techniques used to represent and evaluate reasoning under uncertainty # acquire the ability to critically reflect on the successes and failings of each proposed account # learn to analyse the assumptions underlying each different proposal to represent or manage uncertainty.
Related Course(s):	Diploma in Arts (Philosophy)
Related Majors/Minors/Specialisations:	History & Philosophy of Science Philosophy Philosophy Major