UNIB20005 Language and Computation

Credit Points:	12.5
Level:	2 (Undergraduate)
Dates & Locations:	This subject is not offered in 2016.
Time Commitment:	Contact Hours: Thirty hours of lectures and twenty hours of workshops (ten 2-hour workshops). Total Time Commitment: 170 hours
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	12.5 points of level-1 study in logic, mathematics, informatics, linguistics or equivalent discipline that involves abstract formal reasoning.
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:	A/Prof Steven Bird email: **sbird@unimelb.edu.au (mailto:sbird@unimelb.edu.au)**
Subject Overview:	**AIMS** Language is the chief manifestation of human intelligence. Through language we express basic needs and lofty aspirations, technical know-how and flights of fantasy. Ideas are shared over great separations of distance and time. Thanks to this richness, the study of language is part of many disciplines including linguistics, philosophy, anthropology, psychology, law, literary criticism, hermeneutics, cryptanalysis, speech pathology, forensics and digital signal processing. In computer science, a long-standing challenge has been to build intelligent machines. The holy grail of artificial intelligence, enshrined in the "Turing Test", is to construct an automatic dialogue system that is so adept with language that humans cannot tell it apart from another human. As fields of inquiry, Language and Computation exist on opposing sides of the divide between the Humanities and the Sciences. However, their history and future are closely intertwined. In the early 1900's, a research program to reconstruct mathematical reasoning using logic led to the notion of language as a formal system amenable to automatic processing, and thence to the development of computer languages. Looking to the future, society faces a huge technological challenge of accessing knowledge from the veritable ocean of textual information that inundates our lives. **INDICATIVE CONTENT** This subject offers students across the University with a range of resources for understanding the formal structure and interpretation of language, and how language can be manipulated intelligently by machines. Students will appreciate linguistic structure at two vastly different levels: the isolated sentence, and the terabytes of text on the web. Topics include: fundamental concepts in the structure and interpretation of sentences, the philosophy of language, applications of information theory, and the limits of machine intelligence

Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** On completion of this subject, students should be able to analyze the structure and content of natural language texts using formal techniques from logic, linguistics and computer science.
Assessment:	Hurdle Requirement: Students are required to attend a minimum of 75%, requiring approximately 75 - 80 hours of workshops, and to achieve at least 25/50 for both the continuous assessment and the final exam.
Prescribed Texts:	Natural Language Processing in Python (S Bird, E Klein, E Loper, 2009.)
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2016/B-ARTS)** # **Bachelor of Biomedicine (https://handbook.unimelb.edu.au/view/2016/B-BMED)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2016/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2016/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2016/B-MUS)** # **Bachelor of Science (https://handbook.unimelb.edu.au/view/2016/B-SCI)** # **Bachelor of Engineering (https://handbook.unimelb.edu.au/view/2016/B-ENG)** 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:	On completion of this subject students should: # Be able to think critically and to organise information in clear and precise ways # Have improved skills in formal reasoning # Be proficient in cross-disciplinary techniques # Have developed experience and skills in working in a group # Be able to synthesise informaiton and communicate results effectively.
Notes:	**INDICATIVE KEY LEARNING RESOURCES** The key learning resource is the *Natural Language Toolkit* and associated data and documentation, available from nltk.org. Readings and worksheets will be posted online. Lecture recordings will be available. **CAREERS / INDUSTRY LINKS** This subject is relevant to careers in the sciences and humanities that involve analysis of written language such as investigating the effectiveness of media campaigns as reflected in blog posts, or identifying the required reading age of a document, or translating information needs into database queries. Students will work with substantial quantities of real world data and gain experience working with language as it is used in popular culture.