GEOM90042 Spatial Information Programming

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 48 hours, comprising of two hours of lectures, one hour of tutorials, and one hour of practicals per week (tutorials and practicals in a computer lab) Total Time Commitment: 200 hours
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students cannot enrol in and gain credit for this subject and:

Subject	Study Period Commencement:	Credit Points:
GEOM30010 Programming Geomatics Applications	Not offered 2015	12.50

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
Coordinator:	Dr Nicole Ronald
Contact:	Dr Nicole Ronald **nicole.ronald@unimelb.edu.au (mailto:nicole.ronald@unimelb.edu.au)**
Subject Overview:	**AIMS** Many application problems in spatial information cannot be solved with standard tools but require programming for fast and effective solutions. Using case studies, this subject will enable students to develop software programs that address specific spatial information problems, beginning with learning the syntax, program structure and data types of an object oriented programming language such as Python. Course projects involve many aspects of the software development life cycle, from algorithm design to software implementation. This subject assumes students are familiar with spatial information data and the varied ways it is used by various stakeholders. Students who successfully complete this subject may find work in specialist consulting practices, spatial information research organisations or as software developers for the spatial information industry. **INDICATIVE CONTENT** # Variables and data types (including dictionaries) # Input and output # Selection and iteration

	# Scripting and geo-processing (customise a GIS) # Store and process spatial data # Manipulate spatial data # Visualise spatial data # Access dynamically changing data from the Web.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** Having completed this unit the student is expected to: 1 Design and generate an algorithmic solution to a specified spatial information problem 2 Use an object oriented programming language to design, implement and test solutions 3 Use dynamically changing web content in these solutions 4 Document and maintain software programs.
Assessment:	One 2-hour examination, held in end of semester examination period (60%). Associated with Intended Learning Outcomes (ILOs) 1 - 4 Two written programs and the relevant documentation to support the program (3000 words equivalent), due mid-semester and end of semester, requiring approximately 50-55 hours of work in total (20% each, 40%). ILOs 1 - 4. Hurdle requirement: Students will be required to receive a passing mark for a 1-week assignment which will introduce into principles of GIS at the beginning of semester To pass this subject, students must obtain a pass in the examination.
Prescribed Texts:	None
Recommended Texts:	# Jennings, N., 2011. *A Python Primer for ArcGIS*, CreateSpace Independent Publishing Platform # Cogliati, J. 2005, *Non-Programmer's Tutorial for Python* # Downey, A.B., Elkner, J. and Meyers, C., 2008. *Think Python: How to Think Like a Computer Scientist*. O'Reilly Media # Mark Lutz: *Learning Python* (3rd ed.), O'Reilly Media # van Rossum, G. and Drake, F.L. Jr. (Editor), 2003. *The Python Language Reference Manual*, (Version 3.2) Network Theory Ltd # Beazley, D.M., 2006. *Python Essential Reference* (4th ed.), Addison-Wesley
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	The following generic skills will be strengthened as a result of this course of study: # Ability to apply knowledge of science and engineering fundamentals # Ability to undertake problem identification, formulation, and solution # Ability to communicate effectively, with the engineering team and with the community at large # Ability to manage information and documentation # Understanding of professional and ethical responsibilities, and commitment to them # Capacity for lifelong learning and professional development.
Notes:	**LEARNING AND TEACHING METHODS** There will be lectures covering the addressed topics. Additionally, there will be computer labs, which will allow students to apply previously learnt concepts, methods and approaches. Students will also have time to work on the practical assignments. Labs start in week 1 and then run until the end of the semester. **INDICATIVE KEY LEARNING RESOURCES** # Jennings, N., 2011. *A Python Primer for ArcGIS*, CreateSpace Independent Publishing Platform # Cogliati, J., 2005, *Non-Programmer's Tutorial for Python* # Downey, A.B., Elkner, J. and Meyers, C., 2008. *Think Python: How to Think Like a Computer Scientist*. O'Reilly Media

	# Mark Lutz: *Learning Python* (3rd ed.), O'Reilly Media # van Rossum, G. and Drake, F.L. Jr.(Editor), 2003. *The Python Language Reference Manual*, (Version 3.2) Network Theory Ltd # Beazley, D.M., 2006. *Python Essential Reference* (4th ed.), Addison-Wesley **CAREERS / INDUSTRY LINKS** Spatial information services have grown into a major sector. Being able to combine a deep understanding of the fundamentals of spatial information with the ability to develop custom-made tools and analysis methods is a significant advantage in many areas of the spatial industry. Thus, successfully participating in this subject increases students' attractiveness for employers and broadens their career opportunities.
Related Course(s):	Master of Geographic Information Technology Master of Information Systems Master of Information Technology Master of Philosophy - Engineering Master of Spatial Information Science Ph.D.- Engineering
Related Majors/Minors/ Specialisations:	MIS Professional Specialisation MIT Spatial Specialisation