GEOM90006 Spatial Analysis

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 48 hours (Lectures: 2 hours per week; Laboratory Sessions: 2 hours per week) Total Time Commitment: 200 hours
Prerequisites:	Successful completion of the following is required to enrol in this subject:

Subject	Study Period Commencement:	Credit Points:
GEOM90008 Foundations of Spatial Information	Semester 1	12.50

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
Coordinator:	Dr Mohsen Kalantari Soltanieh
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Subject Overview:	**AIMS** In this subject students will learn about the foundations of spatial data and their analysis. Emphasis will be placed on learning how to investigate the patterns that arise as a result of processes that may be operating in space. For example, students will learn to identify geographic clusters of disease cases, or hotspots of crime. A variety of scientific tools including probability theory, combinatorics, descriptive statistics, distributions and matrix algebra will be taught. Students will learn essential skills that are fundamental for all applications of geographic information. The subject partners with other subjects on spatial data management and visualization, and is of particular relevance to people wishing to establish a career in the spatial information industry, the environmental or planning industry. Spatial Analysis builds on the fundamental knowledge of probability and statistics, mathematics, as well as computer literacy to write simple algorithms, and the preparation and management of data for sophisticated analysis software. **INDICATIVE CONTENT**

	Spatial autocorrelation, spatial data structures and algorithms, point patterns, measures of dispersion, measures of arrangements, line and network analysis, patterns of areas and in fields, and the role of spatial scale and spatial aggregation problems.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** On completion of this subject the student is expected to: 1 Describe and discuss data structures and analysis procedures to analyse spatial data 2 Design and run a spatial analysis appropriate to a given phenomenon 3 Distinguish and characterise patterns and processes in geographic space 4 Apply GIS software for spatial analysis, and interpret the results.
Assessment:	A 30 minute written mid-semester exam (10%). Intended Learning Outcomes 1 to 3 are addressed in this examination A 2-hour written examination (45%) end of semester. ILOs 1 to 3 are addressed in this examination Four practical assignment reports (45%) of approximately 5 pages length each (500 words plus computer output) due evenly throughout the semester, requiring approximately 55-60 hours in total. ILO 4 is addressed in these reports.
Prescribed Texts:	O'Sullivan, D. and Unwin, D.J. (2002). Geographic Information Analysis. Hoboken, NJ: John Wiley & Sons
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:	On successful completion students should have the: # Ability to apply knowledge of science and engineering fundamentals # Ability to undertake problem identification, formulation, and solution # Ability to conduct an engineering project # Ability to communicate effectively, with the engineering team and with the community at large # Ability to manage information and documentation
Notes:	**LEARNING AND TEACHING METHODS** The subject is based principally on presentations by academic lecturers. In addition each student prepares four practical assignment reports. A computer laboratory will be used by students to undertake the tutorials. **INDICATIVE KEY LEARNING RESOURCES** Major text book: O'Sullivan, D. and Unwin, D.J. (2002). *Geographic Information Analysis*. Hoboken, NJ: John Wiley & Sons **CAREERS / INDUSTRY LINKS** Spatial data analysis offers necessary skills to students to work in variety of disciplines such as geomatics, geography, economics, social science, the environmental sciences and statistics.
Related Course(s):	Doctor of Philosophy - Engineering Master of Geographic Information Technology Master of Information Technology Master of Information Technology Master of Philosophy - Engineering Master of Spatial Information Science
Related Majors/Minors/ Specialisations:	Energy Studies Energy Studies MIT Spatial Specialisation Master of Engineering (Spatial) Tailored Specialisation Tailored Specialisation