GEOM90018 Spatial Databases

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 48 hours (Lectures: 2 per week; Laboratory Exercises: 2 hours per week) Total Time Commitment: 200 hours
Prerequisites:	Successful completion of the following subject is required to enrol: **Subject** | **Study Period Commencement:** | **Credit Points:** GEOM90008 Foundations of Spatial Information | Semester 1 | 12.50 GEOM90008 Foundations of Spatial Information may be taken concurrently
Corequisites:	None
Recommended Background Knowledge:	A background in (non-spatial) databases is strongly recommended for this course, for example successful completion of SINF90001/INFO90002 Database Systems and Information Modelling, or similar subjects. Students who do not already have a strong background in databases are required before the start of the course to achieve an intermediate level of understanding and competence in relational database design, ER modelling, relational algebra, and SQL. Students wishing to acquire these required skills are recommended to engage in the following self-study activities before the beginning of the course: 1 Read, understand, and be able to apply the principles and concepts covered in Chapter 2 of Worboys and Duckham (2004) *GIS: A Computing Perspective* 2nd edition, CRC Press 2 Watch, understand, and be able to apply the principles and concepts contained in a series of short video lectures made available on the subject website 3 Learn and practice programming basic SQL queries using online resources, such those recommended on the subject website.
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 Martin Tomko
Contact:	Martin Tomko **tomkom@unimelb.edu.au (mailto:tomkom@unimelb.edu.au)**
Subject Overview:	**AIMS** Spatial databases are fundamental to any geographical information system. Efficient and effective representation and retrieval of spatial information is a non-trivial task. This subject will cover the concepts, methods, and approaches that allow for efficient representation, querying, and retrieval of spatial data.

	This subject builds on a student's knowledge of computer programming, databases, and spatial information. Students who successfully complete this subject may find professional employment in designing, implementing, customising and maintaining databases for the increasingly wide range of spatial software applications. **INDICATIVE CONTENT** Fundamentals of spatial databases; spatial data modelling in relational databases, including vector, raster, and network data; spatial operations, including geometric, topological, set-oriented, and network operations; spatial indexes and access methods, including quadtrees and R-trees.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** On completion of this subject the student is expected to: 1 Describe the need for spatial databases, and the differences between spatial and non-spatial database systems 2 Describe the design and principles of spatial databases, including techniques for efficiently storing and retrieving spatial data 3 Design queries for spatial database systems 4 Use and customize specific spatial database systems.
Assessment:	Three-hour exam (60%) held in the end of the semester examination period. Intended Learning Outcomes (ILOs) 1, 2 and 3 are addressed in the examination Four practical assignment reports (40%) each of about 3 pages length (500 words), each requiring approximately 13 – 15 hours of work, due evenly throughout the semester. ILOs 1 to 4 are addressed in the reports Hurdle requirement: Students must achieve a mark of at least 50% in the written examination in order to pass this subject.
Prescribed Texts:	Worboys and Duckham, 2004. GIS: A computing perspective, second edition, CRC Press, ISBN: 0415283752.
Recommended Texts:	# Rigaux, Scholl and Voisard, 2002. *Spatial databases: With application to GIS*, Morgan Kaufmann, ISBN: 1558605886. # Shekhar and Chawla, 2002. *Spatial databases: A tour*, Prentice Hall, ISBN: 0130174807. # Silberschatz, Korth and Sudarshan, *Database System Concepts*, McGraw Hill.
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 of this subject students should be able to: # Apply knowledge of science and engineering fundamentals # Undertake problem identification, formulation, and solution # Communicate effectively, with the engineering team and with the community at large # Manage information and documentation.
Notes:	**LEARNING AND TEACHING METHODS** There will be lectures associated with weekly lab exercises to be done in a computing lab. Students are expected to interact with real systems and interact with each other in the labs. **INDICATIVE KEY LEARNING RESOURCES** # Worboys and Duckham, 2004. *GIS: A computing perspective*, second edition, CRC Press, ISBN: 0415283752. # Rigaux, Scholl and Voisard, 2002. *Spatial databases: With application to GIS*, Morgan Kaufmann, ISBN: 1558605886. # Shekhar and Chawla, 2002. *Spatial databases: A tour*, Prentice Hall, ISBN: 0130174807. # Silberschatz, Korth and Sudarshan, *Database System Concepts*, McGraw Hill. **CAREERS / INDUSTRY LINKS**

	Spatial Databases are fundamental to Spatial Information Science and Geographic Information Systems. Students will acquire knowledge in SQL and some of the dominant database systems on the market, which will be essential for any future career they may aim to pursue.
Related Course(s):	Doctor of Philosophy - Engineering Master of Geographic Information Technology Master of Information Systems Master of Information Systems Master of Information Systems Master of Information Technology Master of Philosophy - Engineering Master of Spatial Information Science
Related Majors/Minors/ Specialisations:	MIS Professional Specialisation MIS Research Specialisation MIT Spatial Specialisation Master of Engineering (Spatial)