451-617 Fundamentals of Positioning Technologies

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: 4 hours per week (2 hours lecture, 2 hours practical); Non-contact time commitment: 96 hours Total Time Commitment: Not available
Prerequisites:	None
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 Rohan Mark Bennett
Subject Overview:	Positioning technologies such as the Global Positioning System (GPS) and wireless networks have revolutionised the way in which spatial data is collected and used. Traditional measurement techniques and their associated limitations (such as the need for clear lines of sight) have today been superseded by lightweight, versatile devices that can operate almost anywhere and at anytime. As such, it has encouraged the development of an expanding range of applications based around positioning such as LBS (Location Based Services). The efficient and effective use of positioning technologies by spatial information specialists requires knowledge of some basic geodetic principles. Concepts such as coordinate systems, geodetic datums, coordinate transformations and conversions all emerge as fundamental to the correct application and interpretation of positioning data. This subject has been designed to expose students to the principles of positioning technologies. The geodetic issues that need to be considered in the appropriate use of positioning technologies form a key component of the subject material. Furthermore, the wide variety of tasks to which such technologies can be applied is illustrated by reference to numerous practical examples.
Assessment:	One 3-hour written examination at the end of semester (40%) and one 1 hour mid semester test (10%). A semester long investigative research exercise set at the beginning of semester (30%). The submissions for this assignment comprises of two reports (no more than 2000 words in total) due in weeks four (5%), and twelve (20%) and a brief presentation in week eleven (5%). Two additional practical submissions each worth 10% and the equivalent of 1000-words.
Prescribed Texts:	None
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 be able to:

	# describe the operational and performance characteristics of modern positioning technologies # describe the measurements made by modern positioning technologies and explain how they relate to the generation of key spatial datasets # explain the different types and nature of errors that occur in spatial data measurements and techniques for their minimization # discuss and critically evaluate how these errors determine the potential use of different positioning technologies within a spatial application # relate fundamental geodetic theory to recognising problems that arise in spatial data integration due to the incorrect use of datums and map projections # solve common problems that arise in spatial data integration by applying geodetic theory within the ArcGIS software # demonstrate the field procedure for using GPS receivers for spatial data acquisition # demonstrate the "field to office" process from data acquisition to the generation of a spatial dataset within ArcGIS # evaluate next generation positioning technologies and make conclusions as to their impact on spatial data applications
Related Course(s):	Graduate Certificate in Geographic Information Systems Graduate Diploma in Geographic Information Systems Graduate Diploma in Geomatics Science Master of Applied Science (Geographic Information Systems) Master of Geographic Information Technology