GEOM90033 Satellite Positioning Systems

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 48 hours, comprising of two hours of lectures and two hours of practicals per week. Total Time Commitment: 200 hours
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:	Assoc Prof Allison Kealy
Contact:	Associate Professor Allison Kealy **a.kealy@unimelb.edu.au (https://mce_host/faces/htdocs/a.kealy@unimelb.edu.au)**
Subject Overview:	**AIMS** In this subject students will learn the theory and applications of Global Navigation Satellite Systems (GNSS), such as the Global Positioning Systems (GPS). The subject focuses on high precision GNSS, their design and fundamental operational characteristics, error sources and mitigation, measurement and data processing techniques. It expands and builds on the mathematical and scientific content covered in GEOM90040 Geomatics Problem Solving and Analysis or its equivalent. It is a pre requisite for the subject GEOM90039 Advanced Surveying and Mapping. The subject is of broad relevance to students with an interest in technology or to those specifically wishing to establish a career in engineering, mining or cadastral surveying, but is also relevant to a range of mapping, spatial, land surveying and civil engineering disciplines where the capture and processing of spatial or survey measurements to meet a specific performance specification should be considered. **INDICATIVE CONTENT** High precision GPS surveying, Global Navigation Satellite Systems, GPS measurements, Differential GPS, GPS reference station networks, GPS errors, ellipsoidal heights, geodetic datum, geoid, GPS data processing. Note: This subject has been integrated with the Skills Towards Employment Program (STEP) and contains activities that can assist in the completion of the Engineering Practice Hurdle (EPH).

Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** Having completed this unit the student is expected to: 1 Describe the operation of available satellite positioning systems such as GPS 2 Discuss the error sources for GPS and how they impact on the achievable positioning accuracies 3 Plan and design a real-world high precision GPS positioning task 4 Use high precision GPS receiver hardware to collect measurement data for real-time and post processed GPS positioning 5 Use commercial GPS processing software to generate GPS solutions and undertake a robust analysis of the solution quality.
Assessment:	3-hour written examination, held in the end of semester examination period (50%). Associated with Intended Learning Outcomes (ILOs) 1 - 5 Three written assignment reports (totalling approximately 2500 words), requiring approximately 65 hours of work, due evenly across the semester (50%). Associated with ILOs 1 - 5. Hurdle requirement: Students must achieve a grade of at least 50% in the examination in order to pass the subject.
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 completion of this subject students will have the: # Ability to communicate effectively, with the engineering team and with the community at large # Ability to manage information and documentation # Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member # Ability to undertake problem identification, formulation, and solution # Understanding of social, cultural, global, and environmental responsibilities and the need to employ principles of sustainable development # Capacity for creativity and innovation # Understanding of professional and ethical responsibilities, and commitment to them # Capacity for lifelong learning and professional development.
Notes:	**LEARNING AND TEACHING METHODS** This subject is delivered through a combination of presentations and practical exercises which have been integrated to complement each other. Presentations are used to communicate the necessary theoretical concepts which are then reinforced through the field practical exercise. A significant field exercise submitted at the end of the subject is designed to synthesise the knowledge accumulated across the semester. **INDICATIVE KEY LEARNING RESOURCES** User and technical manuals for GPS receivers used in practical exercises. **CAREERS / INDUSTRY LINKS** Presenters from relevant technology manufacturers will provide students with access the state-of-the-art technology in satellite positioning systems. These industry participants will demonstrate best practice in the use of currently available GNSS technology and software as well as discuss industry case study applications that showcase the application and use of high precision GNSS hardware, associated infrastructure and internationally available resources.
Related Course(s):	Master of Information Technology Master of Information Technology Master of Philosophy - Engineering Ph.D.- Engineering
Related Majors/Minors/ Specialisations:	MIT Spatial Specialisation Master of Engineering (Civil) Master of Engineering (Environmental)

	Master of Engineering (Spatial)