

**Department of Geomatics**  
**451-337 Satellite Positioning and Geodesy**  
**Mid-Semester Test 2007**

*Attempt to answer all questions*  
*All questions are worth 10 marks*

**Question 1** (*Geodetic Coordinates and Reference Frames*)

- (a) Provide a complete description, including diagrams where appropriate, of the three coordinate systems commonly used in geodesy.  
*(10 marks)*

**Question 2** (*Introduction to GPS*)

- (a) Explain and illustrate the flow of data within the Control Segment and between the Control Segment and Space Segment.  
*(5 marks)*
- (b) Describe the measurement signals transmitted by a GPS satellite, including the relationship between them and the benefits, limitations and some possible applications of each.  
*(5 marks)*

**Question 3** (*Code Based GPS Positioning*)

- (a) Explain the principle of DGPS and elaborate on why differential GPS yields significantly better accuracy than single receiver positioning.  
*(5 marks)*
- (b) Define the GPS pseudorange observable and describe the principle upon which a GPS receiver measures a pseudo-range. Explain how such measurements can be combined to determine receiver location.  
*(5 marks)*

**Question 4** (*Miscellaneous*)

- (a) What were the main steps taken to define and realise GDA94?  
*(5 marks)*
- (b) Give a complete description of the 3D conformal transformation model used in geodesy and provide some examples of its use.  
*(5 marks)*

**..... End of Test .....**