

GEOG.607. GLOBAL POSITIONING SYSTEM (GPS) AND BASIC GEODESY 3(2-1)

Course Objective

To train students in collecting geo-spatial data through GPS for determining position, altitude, track, velocity and time in a reference system on the Earth and export to GIS system.

Course Outline

1. Introduction

- o Global Positioning System (GPS)
- o Reference system
- o GPS Satellite Orbits
- o Propagation of the GPS Signals
- o GPS Receivers and the observable
- o GPS Observation and positioning concept

2. GPS Data Processing Methods

- o Quality control and GPS
- o GPS carrier phase
- o Ambiguity fixing concept
- o Fixing concepts
- o Active GPS measurements

3. GPS as a Tool in Global Geodynamics

- o Atmospheric Models from GPS
- o Spherical earth, ellipsoidal earth, geoidal earth
- o Cartographical use of the sphere.

4. Geographical Coordinates

- o Latitude longitude
- o Properties of the graticules
- o Determination of Horizontal Control Network, Vertical control,
- o Data export from GPS

Recommended Books:

1. El-Rabbany, A. (2006) "Introduction to GPS: The Global Positioning System", Artech House Publishers, Boston.
2. Aronoff, S. (2005) "Remote Sensing for GIS Managers". ESRI Press, New York.
3. Smith, J.R. (1997) "Introduction to geodesy: The history and concept of Modern geodesy". John Wiley and Ltd. London.
4. Kleusberg, A. and Teunissen (1996) "GPS for Geodesy". Lecture Notes in earth sciences, Springer.
5. Maginr, D. J. (1991) "Geographic Information System". Longman, London.
6. Krakiwsky, E. J. Vanicek (1986) "Geodesy: The concept",. Elsevier Science publishing Co.