

University of KwaZulu-Natal, Pietermaritzburg Campus
School of Agriculture, Earth & Environmental Sciences
November 2014 Examinations
ENVS 720: Advanced Remote Sensing

This paper consists of **ONE** page.

Time: 3 Hours

Internal Examiner: Prof O. Mutanga &
Dr R. Ismail

Marks: 300

External Examiner: Prof S. Grab

Answer any **THREE** questions. Each question carries 100 marks.

1. Assume that you are employed as a Chief Scientist at the South African National Space Agency (SANSA) and have been assigned a task to advise Government on the specifications of a new South African satellite sensor for vegetation and agricultural monitoring. Propose and justify the sensor specifications that you would recommend. Your answer should consider the spatial, spectral, temporal resolutions, and the positioning of the bands along the electromagnetic spectrum to maximise signal detection. [100]
2. Vegetation indices are widely utilized to extract useful information from remotely sensed image data. Discuss the formulation, interpretation and utility of existing vegetation indices (such as NDVI) with specific emphasis on the remote sensing of vegetation. [100]
3. You are working as a remote sensing analyst for a South African forestry company. You have acquired multiple Landsat 7 ETM and Landsat 5 TM images over a plantation located in a mountainous region of the country. Describe and discuss some of the radiometric errors you could expect from your Landsat datasets. Additionally, propose how you would correct these errors to ensure the homogeneity of your multitemporal Landsat datasets. [100]
4. With reference to specific examples, critically examine the remote sensing techniques that are used for change detection of land cover features. [100]
5. Using specific case studies, discuss in detail the role of remote sensing in mapping and monitoring various aspects of biodiversity. [100]

