GWANDA STATE UNIVERSITY

FACULTY OF ENGINEERING AND ENVIRONMENT

DEPARTMENT OF GEOMATICS AND SURVEYING

GIS Data Structures and Algorithms

ESG 2110

Examination Paper

November 2024

This examination paper consists of 2 pages

Time Allowed: **3 hours**

Total Marks: **100**

Examiner's Name: Mr N.S. Maphosa

INSTRUCTIONS

1. **Answer ALL 4 questions**
2. **Save each answer in a new folder and label question number**

1. Using QGIS version 2.14, georeference the scanned geological map image of the Filabusi greenstone belt provided in the "GSU2024" folder within the documents directory, and save the georeferenced output in a new folder as "Georef_1.tif" [25]

2. Within QGIS 2.14, import the "Epoch_Mine.tiff" multispectral raster dataset from your local directory. Carefully digitize and vectorize prominent geospatial features, including geological structures, hydrological networks, infrastructure, and anthropogenic constructs observable within the imagery. [25]

3. Using datasets in a folder called Lab1, create a detailed and spatially accurate map of Zvishavane District and save your final output as ZvishMap_1. [25]

4. Using the python console in QGIS write and run a script to calculate NDVI using landsat 8 images in your directory. Save the script and the final output as NDVI_Script1 and NDVI_1F respectively in a new folder [25]