



ZIMBABWE EZEKIEL GUTI UNIVERSITY
DIPLOMA IN GEOGRAPHICAL INFORMATION SYSTEM
PART 2

GISRS 123: GOOGLE EARTH ENGINE AND REMOTE SENSING APPLICATIONS

FACILITATOR: MR G. W KATURUZA

TIME: 2 HOURS

DATE: June 2025

09 JUN 2025

INSTRUCTIONS TO CANDIDATES:

1. **Section A:** Question 1 is *compulsory* (40 marks).
2. **Section B:** Answer *any 3 questions* from Questions 2 to 6 (20 marks each).

Overall Total Marks: 100 Marks

ADDITIONAL MATERIALS

- *Answer Booklet.*

Section A: Compulsory Question (40 Marks)

Question 1:

Explain the significance of cloud-based geospatial platforms, focusing on Google Earth Engine (GEE) for environmental monitoring in Africa. Discuss:

a. Key features and advantages of GEE for remote sensing applications.

[10 Marks]

b. The process of accessing and processing satellite imagery using GEE.

[10 Marks]

c. Major challenges of implementing GEE-based projects in Zimbabwe.

[10

Marks]

d. Provide examples of how GEE-supported projects in Zimbabwe or Southern Africa, such as drought, flood, or land cover monitoring can be implemented.

[10 Marks]

Section B: Optional Questions (Answer Any 3; 20 Marks Each)

Question 2:

a. Explain the steps involved in creating and visualizing a NDVI time series in GEE.

[8

Marks]

b. Discuss the importance of cloud masking in time series analysis.

[6

Marks]

c. Give an example of how NDVI time series analysis can support agricultural planning in Zimbabwe.

[6 Marks]

Question 3:

a. Describe how GEE can be used for flood mapping and early warning systems.

[8 Marks]

b. Discuss the strengths and limitations of using GEE for disaster management.

[6 Marks]

- c. Provide a case study where GEE was used to monitor flooding in Zimbabwe or the region. [6 Marks]

Question 4:

- a. What is the role of machine learning in GEE for land cover classification? [8 Marks]
- b. Explain the process of training a classifier and validating results in GEE. [6 Marks]
- c. Discuss two challenges faced in applying machine learning to remote sensing data in Africa. [6 Marks]

Question 5:

- a. Outline the steps for integrating socio-economic data with remote sensing data in GEE. [8 Marks]
- b. Provide an example where integrated analysis informed policy or resource allocation in Zimbabwe. [6 Marks]
- c. Discuss the limitations of combining remote sensing and socio-economic data. [6 Marks]

Question 6:

- a. Identify two sources of free satellite data available in GEE for Southern Africa. [6 Marks]
- b. Explain the importance of spatial resolution for remote sensing analysis in GEE. [8 Marks]
- c. Discuss the role of GEE in supporting Sustainable Development Goals (SDGs) monitoring in Africa. [6 Marks]

****END OF EXAMINATION****