NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF ENVIRONMENTAL SCIENCE

DEPARTMENT OF GEOSPATIAL SCIENCE

SPATIAL CONCEPTS AND SPATIAL ANALYSIS (EGR 1202)

Main Examination Paper

October 2024

This Examination Paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: Nil

Internal Examiner: Ms Z. Dzinotizei

External Examiner: Dr M. Shekede

INSTRUCTIONS

1. Answer **QUESTION ONE** and any **THREE** others
2. Each question carries 25 marks

MARK ALLOCATION

QUESTION	**MARKS**
1.	25
2.	25
3.	25
4.	25
5.	25
6.	25
TOTAL	**100**

1. (a) Define a Geographic Information System (GIS) and explain how it can facilitate spatial analysis. **[5 Marks]**
   (b) Outline the steps involved in the spatial analysis process. **[20 Marks]**

2. Explain how the following methods can be used to analyse the terrain characteristics:
   (a) Slope Analysis **[5 Marks]**
   (b) Aspect Analysis **[5 Marks]**
   (c) Viewshade Analysis **[5 Marks]**
   (d) Curvature Analysis **[5 Marks]**
   (e) Hillshade Analysis **[5 Marks]**

3. With the aid of diagrams, describe and explain how vector overlay analysis can be applied to assess spatial relationships of geographic features.

4. Describe and explain the applications of buffer analysis in natural resources management.

5. (a) Differentiate between attribute and spatial queries. **[6 Marks]**
   (b) Explain the importance of measurement techniques in environmental studies. **[12 Marks]**
   (c) Explain the importance of spatial data maintenance. **[7 Marks]**

6. With the aid of an example, explain the utility of multi-criteria decision analysis in flood risk assessment.