NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF ENVIRONMENTAL SCIENCE

DEPARTMENT OF GEOSPATIAL SCIENCE

MSC DEGREE IN APPLIED GEOGRAPHICAL INFORMATION SCIENCE AND REMOTE SENSING

UNMANNED AERIAL VEHICLE SYSTEMS

EGR 5104

Regular Examination Paper

November 2024

This examination paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: Mr Bukhosi Ngqabutho Khumalo

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) Identify and explain the institutional and regulatory frameworks governing UAV operations in Zimbabwe. **(10 marks)**

(b) Discuss the legal and safety considerations that must be taken into account when deploying UAVs for remote sensing **(15 marks)**

2. Discuss the applications of UAVS in the following fields:

a) Forest structure parameter estimation. **(5 marks)**
b) Crop diseases and pests monitoring. **(5 marks)**
c) Power lines and accessories detection. **(5 marks)**
d) Archeological Documentation. **(5 marks)**
e) Forestry. **(5 marks)**

3(a) Outline the history and development of Remotely Piloted Aircraft Systems **(15 marks)**

(b) UAV remote sensing has several advantages compared with satellite remote sensing. Discuss? **(10 marks)**

4. Describe the various types of drones based on their design and functionality.

5(a) Identify and explain the primary components of a UAV system. **(15 marks)**

(b) Discuss the role of the Ground Control Station (GCS) in UAV operations. **(10 marks)**

6(a) Define what payloads are in the context of UAV operations **(5 marks)**

(b) Discuss at least three types of sensors that can be used as payloads on UAVs and their specific applications in remote sensing. **(20 marks)**

END OF EXAMINATION