

**END OF SEMESTER EXAMINATIONS**

2ND SEMESTER 2022/2023 ACADEMIC YEAR

DATE: JULY 2023

**COURSE CODE: CVE 403**

**COURSE TITLE: CIVIL ENGINEERING APPLICATIONS OF GIS**

**LECTURER’S NAME: EUNICE ATTAFUAH**

**DURATION: 3 HOURS**

**APPENDICES**

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|  | **COURSE OUTLINE**  **(MAIN TOPICS)** | **QUESTION NO.** |
| **MajorTopic-1** | Introduction to GIS | 1,6d,7b,10a |
| **MajorTopic-2** | GIS Data Types | 3,6c,7c,7d,8c |
| **MajorTopic-3** | Spatial Referencing | 2,4,6b,7a,9a,9c,10a,b,c |
| **MajorTopic-4** | Database Management | 5,8b |
| **MajorTopic-5** | Map Components (Practical) | 8d |
| **MajorTopic-6** | Google Earth and GIS (Practical) | 6a,8a,9b |
| **MajorTopic-7** | Vector Datasets (Practical) | 9d |

**PART A (UNDERSTANDING)**

**INSTRUCTIONS: Part A contains FIVE questions. Answer ALL questions.**

1. Explain *Geographic Information System (GIS)*.

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| **Major Topic**: Introduction to GIS | **Blooms Designation**  **UN** | **Score**  **5** |

2. Explain map projection to a layman.

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  **UN** | **Score**  **5** |

3. What is non-spatial data?

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| **Major Topic:** GIS Data Types | **Blooms Designation**  **UN** | **Score**  **5** |

4. In your own words, explain conformal maps.

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  **UN** | **Score**  **5** |

**5.** Explain “integrity and security” as a feature of a DBMS.

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| **Major Topic:** Database Management | **Blooms Designation**  **UN** | **Score.**  **5** |

**TOTAL SCORE: 25 MARKS**

**PART B**

**[APPLICATION AND ANALYSIS]**

**INSTRUCTIONS: Part B contains THREE questions. Attempt any TWO questions.**

**Question 6.**

1. Briefly describe the process involved in exporting waypoints from your device to Google Earth.

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| **Major Topic:** Google Earth and GIS (Practical) | **Blooms Designation**  AP | **Score**  **7** |

1. How important is the coordinates system in GIS

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  AN | **Score**  **7** |

1. Distinguish between the spatial and non-spatial data types giving examples of each and emphasizing when and where each type can be used.

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| **Major Topic:** GIS Data Types | **Blooms Designation**  AP | **Score**  **6** |

1. Emphasize the role of people and hardware in the use of GIS

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| **Major Topic:** Introduction to GIS | **Blooms Designation**  AN | **Score**  **5** |

**TOTAL SCORE: 25 MARKS**

**Question 7**

a) Explain why the *Universal Transverse Mercator (UTM) grid coordinate system* is widely used.

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  AP | **Score**  **7** |

b) Explain *digitizing* as applied to GIS. What are the key things to note?

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| **Major Topic:** Introduction to GIS | **Blooms Designation**  AN | **Score**  **7** |

c) Distinguish between the two basic data types giving examples of each and emphasizing when and where each type can be used.

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| **Major Topic:** GIS Data Types | **Blooms Designation**  AP | **Score**  **6** |

d) In your opinion, what is *attribute data* and what is its use in GIS.

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| **Major Topic:** GIS Data Types | **Blooms Designation**  AN | **Score**  **5** |

**TOTAL SCORE: 25 MARKS**

**Question 8**

1. Briefly describe the process involved in exporting data from Google Earth to ArcGIS.

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| **Major Topic:** Google Earth and GIS (Practical) | **Blooms Designation**  AP | **Score**  **7** |

1. What is a Database Management System (DBMS) and why is it useful / important?

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| **Major Topic:** Database Management | **Blooms Designation**  AN | **Score**  **7** |

1. Distinguish between *data* and *information* as used in the GIS environment.

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| **Major Topic:** GIS Data Types | **Blooms Designation**  AP | **Score**  **6** |

1. Explain the components of a map and give details on the need to include these components on the map.

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| **Major Topic:** Map Components (Practical) | **Blooms Designation**  AN | **Score**  **5** |

**TOTAL SCORE: 25 MARKS**

**PART C [EVALUATING AND CREATING]**

**INSTRUCTIONS: Part C contains TWO questions. Answer ONE question.**

**Question 9**

1. In your opinion, how different is the *Universal Transverse Mercator (UTM) grid coordinate system* from other coordinate systems?

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  **CR** | **Score**  **7** |

1. Briefly describe the process involved in exporting waypoints from your device to Google Earth.

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| **Major Topic:** Google Earth and GIS (Practical) | **Blooms Designation**  **EV** | **Score**  **6** |

1. Explain Spatial databases, Geographic Information System and Database Management System and how they relate.

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  **CR** | **Score**  **7** |

1. In your owns, describe how you would produce a map of two independent regions of Ghana (Ashanti and Eastern regions of Ghana) as one showing the district capitals in these regions.

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| **Major Topic:** Vector Datasets (Practical) | **Blooms Designation**  **EV** | **Score**  **5** |

**TOTAL SCORE: 25 MARKS**

**Question 10**

1. The term satellite refers to any object orbiting a larger one, thus Earth’s moon and all the outer moons of the solar system are satellites. Satellites may be natural or artificial. Artificial satellites are often launched by entities including national government, international association, and independent firms. What is the role of satellites in Remote Sensing and GIS?

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  **CR** | **Score**  **7** |

b) In your opinion, what is spatial data and how important are they in GIS. Provide examples where necessary.

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  **EV** | **Score**  **6** |

c) Discuss the accuracy of maps and the various distortions that can occur.

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| **Major Topic:** Spatial Referencing | **Blooms Designation**  **CR** | **Score**  **7** |

d) Educate a class of SHS graduates on the importance of GIS in the field of engineering. Additionally, speak to 2 projects that can employ the use of GIS in engineering.

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| **Major Topic:** Introduction to GIS | **Blooms Designation**  **EV** | **Score**  **5** |

**TOTAL SCORE: 25 MARKS**

**END OF QUESTION PAPER**