UNIVERSITY OF GUAM
UNIBETSEDÅT GUÅHAN

College of Liberal Arts and Social Sciences

Geography Program

Fanuchanan (Fall) 2024

INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (GIS)

GE – 580-01

Mondays & Wednesdays
11:00 AM – 12:20 PM

LOCATION:
ROOM 207

DR. JOSE EDGARDO L. ABAN
abanj@triton.uog.edu
Office: Room 209, HSS Bldg.
Telephone: (671) 735-2878

Office Hours:

Mondays	**12:30 PM – 2:00 PM**
Tuesdays	**11:00 AM – 12:30 PM**
Wednesdays	**12:30 PM – 2:00 PM**
Thursdays	**11:00 AM – 12:30 PM**

STUDENT LEARNING OBJECTIVES FOR THE COURSE

By the end of the course, it is expected that you:

- Have a general understanding of the basic principles of geographic information systems (GIS);
- Have a working technical knowledge of and skills in basic geographic data processing and analysis including new and upcoming techniques;
- Learn classical and novel mapping tools and techniques such as bit not limited to the operation of global positioning systems;
- Apply such knowledge to mundane environmental problems.

GEOGRAPHY MINOR LEARNING OBJECTIVES

The Geography Program has four major learning objectives. Upon completion of your minor, it is expected that you will have fulfilled the following Program Learning Objectives (PLOs):

1. Physical Geography

- Explain and analyse knowledge of facts, functions, and processes of complex earth systems, as well as the methods and techniques used to study these systems. (R/M)

2. Human Geography

- Specify complex and changing demographic, population, political, economic, cultural and environmental patterns within a global context. (R)

3. GIS/Mapping

- Understand and apply analytical methods (e.g., map reading, statistics, advanced geospatial technologies) to geospatial phenomena. (R)

4. Environmental Synthesis

- Synthesize, evaluate and predict changing human and physical interactive Earth patterns in a spatial environmental framework with special emphasis on the Asia Pacific. (M)

**(I) indicates that this course introduces this particular objective.*
(R) indicates that this course re-enforces this particular objective.
(M) indicates that this course was specifically designed with this particular objective in mind.

DESCRIPTION

Geographic Information Systems (GIS) are tools for managing, describing, analyzing, and presenting information about the relationships between where features are (location, size and shape) and what they are like (descriptive information known as attribute data). Because its techniques allow one to represent a multitude of social and environmental data as a map, GIS has become an important tool across a variety of fields including planning, architecture, engineering, public health, environmental science, epidemiology, and business. Further, GIS has become an important political instrument allowing communities and regions to (geo)graphically tell their stories.

GIS is a powerful tool, and this course is meant to introduce students to the basics. Because GIS can be applied to many research fields, this course aims to give students an understanding of its possibilities along with the capabilities to begin engaging those possibilities. The course will focus on teaching through practical examples.

OBJECTIVES

The course seeks to provide students with a basic level of familiarity with several aspects of Geographic Information Systems and Geographic Information Science, such that the range of possibilities for GIS-based work is understood and an adequate foundation for engaging those possibilities is laid. Thus, the objectives for the course are:

1. To provide an understanding of basic skills necessary to work with GIS, predominantly using ESRI's ArcGIS software and/or QGIS (which is a free and open source software);
2. To introduce students to software and techniques beyond ESRI products;
3. To teach spatial data visualization techniques along with introductory knowledge of effective cartography and additional software for the production of maps and other information graphics;
4. To teach skills needed to develop and execute a project requiring GIS as a management, analytical, and/or visualization tool;
5. To identify and access publicly available data sets;
6. To teach the skills necessary to create GIS data through a variety of methods including those offered by global positioning system (GPS) technologies; and
7. To provide an introductory understanding of the ethical questions surrounding data creation, analysis, and representation.

COURSE DELIVERY METHODS

- The course will be delivered face-to-face. However, the following **Online Services** will be utilized and exploited for the delivery of course contents, online discussions and consultations, coordination, as well as the conduct of quizzes (if any) and long exams/finals. As such, students are expected to have access to any of these devices (connected to the Internet) such as a mobile phone, an Ipad, tablet, or a PC laptop, most specially during scheduled exams. It is important all students must have access to these systems/services for effective delivery of educational content as well as ideal learning experience.
    - ***UoG Moodle***
    - ***Google Docs and Google Forms (for quizzes, long exams and Final Exams)***
    - ***Google Video and/or Youtube***

- **UOG MOODLE**

- All course materials (e.g., syllabus, lecture slides, supplementary readings) will be available on UOG Moodle (http://moodle.uog.edu) . Therefore you must self register yourself using the key to be given later by email.

  Lecture slides generally get posted in the UoG Course Moodle a few days after the lecture.

  You will be expected to submit some of the assessments and assignments through Moodle, so start familiarizing yourself with the Web site. Furthermore, if you have questions on the material covered in class or would like to start a forum to discuss a particular topic more in-depth, I encourage you to use Moodle.

  If you are having problems with your account or with Moodle, please call UOG Moodle Support at (671) 735-2620 or send an email to moodlehelp@triton.uog.edu.

GRADE BREAKDOWN

Five (5) Laboratory Exercises/Reports 16% each		**80%**
Special Project * (Annotated Bibliography)		**20 %**
	TOTAL	**100 %**

*(*Note: Extra credits may be given at the discretion of the instructor for notable class participation during class discussions).*

NON-DISCRIMINATION

The University of Guam (UOG) is committed to achieving equal opportunity and full participation of persons with disabilities by providing non-discriminatory access to its services and facilities through the ADA Office. The Mission of the ADA Office is to ensure non-discriminatory access to all benefits, privileges, opportunities and obligations to faculty, staff and community members with disabilities and to ensure a process for full compliance by UOG with the ADA of 1990, as amended, and Section 504 of the Rehabilitation Act of 1973, as amended, taking into account the economic climate and multi-cultural diversity of the institution.

The ADA Office can be contacted at telephone number (671) 735-2244 or Telephone Device for the Deaf (TDD) number (671) 735-2243.

The Enrollment Management & Student Success office provides reasonable accommodations for students in accordance with the UOG Policy and Procedure for student applicants with a disability. The ADA policy can be found on this website.

COURSE SOFTWARE AND EQUIPMENT

Since a huge component of learning and doing GIS comes from practical work, this course will necessitate the use of the following hardware and software for laboratory works and hands-on exercises:

- **PC running on Windows OS or Mac/IOS**
- **ArcGIS** – educational license can be downloaded from the UoG website at the address https://www.uog.edu/it/software/arc-gis.php **and/or**
- **QGIS** – a free and open source software (for Windows and Mac/ IOS) downloadable from https://qgis.org/en/site/forusers/download.html
- GPS units (to be provided by lab) and/or Android/Iphone devices with GPS apps

COURSE POLICIES

- Attendance and Stick to Deadlines. Please do not be late. Later, I will be posting the specific deadlines for submissions as they are required.
- Laptops, phones and tablets allowed, please be considerate and turn off sounds (silent mode) and tones.
- Appropriate accommodations: made for those with medical problems, those in service and those with diagnosed disabilities.
- For individuals covered under the ADA (Americans with Disabilities Act), if you are a student with a disability requiring academic accommodation(s), please contact the Disability Support Services Office to discuss your confidential request. A Faculty Notification letter from the Disability Support Services counselor will be provided to me. To register for academic accommodations, please contact or visit Sallie S. Sablan, DSS counselor in the School of Education, office 110, disabilitysupport@triton.uog.edu or telephone/TDD 671-735-2460.

- No Plagiarism. Cheating has no place in this class.

MODULE OUTLINE (Indicative)

WEEKS	TOPICS	COURSEWORK/ACTIVITY (Note: Wednesdays of every week to be dedicated for Lab/Hands-on)
1	Introduction	
2	Data Models	
3		
4	Geodesy and Map Projections	Exercise 1 • Introduction to Basic Functionalities of ArcGIS or QGIS
5	Data Entry and Editing	
6	Global Navigation Satellite Systems	
7	Aerial and Satellite Images	Exercise 2 • Data Entry and Encoding in ArcGIS or QGIS • Digitizing, Topology • Digital Data, Table Introduction
8	Digital Data Sources	
9	FALL BREAK	
10	Tables and Relational Databases	
11	Basic Spatial Analysis	
12	Topics in Raster Analysis	Exercise 3 • Tables • Spatial Selection • Buffering & Overlay • Raster Analysis
13	Terrain Analysis	
14	Interpolation and Spatial Estimation Part 1	
15	Interpolation and Spatial Estimation Part 2	Exercise 4 • Interpolation • Cartographic Models • Spatial Analysis
16	Data Standards and Quality	
17	Future Trends and Presentations	

RECOMMENDED TEXTBOOK

Dawsen, Christopher J. Series (2011) Geographic Information System. New York, Nova Science Publishers, Inc. eBook

Mandel, Alex, et al (2016) QGIS 2 Cookbook. Birmingham, UK: Packet Publishing. eBook