Department of … Soil and Water Sciences

College of ……Agriculture

University of …Salahaddin University-Erbil

Subject: …GIS

Course Book for 4ᵗʰ year

Lecturer's name: Mr.Fuad Mohammad Ahmad

Academic Year: 2023/2024

Course Book

1. Course name	First semester\ Autumn Semester
2. Lecturer in charge	**Fuad Mohammad Ahmad**
3. Department/ College	**Soil and Water / Agriculture**
4. Contact	**e-mail: fuad.ahmad@su.edu.krd** **Tel: 07503273848**
5. Time (in hours) per week	**Theory: 1 (2hr)** **Practical: 2 (3hr)**
6. Office hours	**Availability of the lecturer to the student during the week** 2hr\day
7. Course code	
8. Teacher's academic profile	**B.Sc in Plant Production, college of agriculture, Tikrit university, 1999.** **MSc. In Remote Sensing and GIS, Soil and Water department, Salahaddin University-Erbil, 2009**
9. Keywords	

10. Course overview:

   The aim of the course is to introduce students to the ways in which Geographical Information systems are used to acquire data, how these data may be analyzed and how the information is used in studies of the natural and human environments. At the end of the course, students should have a good knowledge of the different methods of GIS that are available and the analysis procedures used for studying specific environmental and geographic problems. Students should also be capable of undertaking basic computer-assisted theme analysis and producing thematic images.

11. Course objective:

1. Provide students with an understanding of the importance of Geographical Information Systems.
2. Introduce students to some practical applications of GIS to problems in agriculture and environmental quality.
Students should acquire a good understanding of the concepts above. They should be able to show their mastery of them in oral and written form, in lecture, in the GIS laboratory and in exams.

12. Student's obligation

When they have finished the course, students will have been introduced to a working knowledge of Geographical Information Systems techniques

13. Forms of teaching

Different forms of teaching will be used to reach the objectives of the course: power point presentations for the head titles and definitions. Computer Remote Sensing software will be used to learning how they can use the tools of remotely sensed data.

14. Assessment scheme

I will give two examinations before the final one. The grade is distributed among the theoretical

examination,(70%), three quizzes (15%) and   class activity(10%).

Finally we take the mean of two or three examination and group project: 25%

Practical Examination 15%

Final examination: 60%

15. Student learning outcome:

Geographical Information System is relatively modern science. Students need to be able to understand both the concepts presented as well as have a basic understanding of the factual nature of the course. In order to achieve that goal, feedback will be given on questions asked in lecture and laboratory, exams and on the final laboratory report in as prompt fashion as possible so that the students will always understand how they stand. These will consist of lectures, laboratory demonstrations, laboratory work , reading assigned scientific papers, writing a final laboratory report and answering those questions that are asked in lecture and GIS laboratory. Initiative on the part of each individual student in asking pertinent questions and inviting conversation on related outside topics will be noted in the final grade. Selected articles; resource texts and reserve library materials may be assigned as required.

16. Course Reading List and References:

- Key references:
  - **George B. Korte, (2010). The GIS Book 5th Edition**
  - **Wlpen L. Gorr and Kristen S. Kurland, (2012). GIS Tutorial 1: Basic Workbook, 10.1 Edition (GIS Tutorials)**

- Magazines and review (internet):
  1. International Journal of Geo-informatics
  2. GIS Sciences and Remote Sensing
  3. http://www.fs.fed.us/eng/rsac/

17. The Topics:

Lecturer's name

Weeks	Subjects	Notes
1st.	Geographical Information Systems (GIS)- An Introduction	• Geographic Information System *GIS*? • Geographic Information Science *GISc*?
2nd.	Maps	• General map formats • Maps Elements • Map symbolization
3nd.	GIS Subsystems	1. a *data input* subsystem; 2. a *data storage and retrieval* subsystem;

		3. a *data manipulation and analysis*subsystem 4. a *data output and display* subsystem
4rd.	Components of GIS	A working GIS integrates five key components: Hardware, Software, Data, People, and Methods.
5th.	Geographic Data	• Geography and Geographic Data • *Geography* provides information about the Earth and distinguishes how features upon the Earth correlate with one another
6th.	Georeferencing	Georeferencing is the process of assigning real-world coordinates to each pixel of the raster.
7th	Geographical Features	There are two types of geographical features, namely 1) natural geographical features 2) artificial geographical features
8th	GIS Attribute Table	It is an *information* about a geographic feature in a GIS, usually stored in a *table* and linked to the feature by a unique identifier
9th	GIS Primitive Objects	GIS Primitive Objects includes Points, Lines and Polygons
10th	Coordinate Systems	• Earth's true shape is a slightly oblate spheroid shape. • *Coordinate Systems* are ways of splitting up the world in order to form transferable units (numbers) that relate to points on a map.
11th	Datum	*Datums* are known geographic shapes of the Earth, which we can apply to maps so coordinate systems can still work perfectly.
12th.	Global Positioning System (GPS)	The *Global Positioning System(GPS)* is asatellite based navigation system that can be used to locate positions any where on earth.
13th	Thematic Mapping	A thematic mapis a type ofmap especially designed to show a particular *theme* (subject) connected with a specific geographic area.
14th	GIS Data Model:Raster Data Structures	*Geographical space* can be tessellated into sets of connected discrete units, which completelycover a flatsurface. The units can be in anyreasonable geometric shape, either regular or irregular.
15th	Geographical Information Systems-Applications-Examples	

18. Practical Topics (If there is any)

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19. Examinations:

1. Compositional: In this type of exam the questions usually starts with Explain how, What are the reasons for…?, Why…?, How….?
With their typical answers
Examples should be provided

2. True or false type of exams:

In this type of exam a short sentence about a specific subject will be provided, and then students will comment on the trueness or falseness of this particular sentence. Examples should be provided

3. Multiple choices:
In this type of exam there will be a number of phrases next or below a statement, students will match the correct phrase. Examples should be provided.