Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	Erbil technology college	
Department	Surveying	
Module Name	Cartography and GIS	
Module Code	CAG302	
Semester	Third	
Credits	7	
Module type	Prerequisite ☐ Core * Assist. ■	
Weekly hours	5	
Weekly hours (Theory)	(2)hr Class	( )hr Workload
Weekly hours (Practical)	(3)hr Class	(189)hr Workload
Lecturer (Theory)	Muhsin Khalid	
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Lecturer (Practical)(cad)	Sadiq Ramazan Younes	
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Course Book

Course Description	The course will start will teaching the basic principles of cartography and making map. Simultaneously, the student will start a GIS project in practical part of the module to implement the principles learnt in theoretical part in practical way. This will help them to get a better insight about the cartography, and will be able to practice them with assistance of teachers. With the progress of theoretical part, the same concepts will be reflected in the map in practical part which will help students to grasp the whole module and its targets.
Course objectives	The course aims to achieve following objectives: • To teach the students the basics of cartography. • Students will learn how to start a real cartographic projects utilizing GIS. • The practice based GIS project will focus on implementing cartographic basics learnt in theoretical part
Student's obligation	The students are required to: -Attend lectures; write necessary notes Continuously follow the lectures, submits required homework and classwork.
Required Learning Materials	Different methods of teaching will be used: 1- Power point presentations. 2- Explanation on the board. 3- Practical exercises using GIS.he subject is taught based on Practical lectures and applications.
Assessment scheme	5% Homework 2% Class activity 25% Mid Term (Theory and practical) 8% Quiz 10% Assignment (report, paper, seminar..) 10% Lab report and activities 20% Final Theoretical 20% Final practical
Specific learning outcome:	At the end of the course students should be able to: 1- start a cartographic project from scratch 2-Implement the basics of cartographic in a real project 3-Solve the problems associated with making maps independently 4-Decide about the suitable coordinate system, map scale, and other map elements
Course References:	Principles of Cartography by: Robinson, A. H., Sale R.D., Mossison J., L. and Meahrck P. H. C ▪ Principles of Cartography by Raisz B. ▪ Cartography Design and Production by Keates J.S.

Course topics (Theory)	Week	Learning Outcome
An overview of the course and its aims.	1st	
An introduction to cartography and general terms.	2nd	
An introduction to cartography and general terms	3rd	
Different map types and purpose of using them	4th	
Standard map features	5th	
Standard map features, map title	6th	
Standard map features, map scale	7th	
Map scales conversion	8th	
How to choose a suitable scale for the map?	9th	
Map orientation and legend	10th	
Map and symbols	11th	
Symbols classification	12th	
Map generalization	13th	
Practical example on how to generalize a map	14th	
Using text in maps	15th	
Practical Topics	**Week**	**Learning Outcome**
Introduction: course structure and course catalog	1st	The concept behind GIS
Starting with ArcMap UI;starting a new project, creating a Dataframe	2nd	Learning ArcMap UI
Starting with ArcCatalog; Learning main tasks in ArcCatalog	3rd	Learning ArcCatalog UI
Importing data into ArcMap; two methods, excel sheet	4th	Importing Data

and manual and labeling features		into GIS
Importing base map and Georeferencing, labelling features	5th	Georeferencing
Creating feature classes, starting digitizing polygons	6th	Making feature classes
Digitizing polygons	7th	Learning digitizing
Digitizing points and lines	8th	8-Digitizing points and lines
Adding fields and adding data into the field	9th	Adding attributes to data
Adding fields and adding data into the field	10th	Adding attributes to data
Labeling features and doing symbology for lines and points	11th	Learning symbology
Labeling features and doing symbology polygons	12th	Learning symbology
Learning layout UI, adding map title, map scale, map legend, and orientation	13th	Adding standard map features
Adding final touches and comparing map layout and map planning concepts	14th	Map layout vs Map planning
Preparing map for print, or exporting it as pdf	15th	Printing map

Questions Example Design

1-Theoretical part

E.g. 1 convert verbal scale to fractional scale if 1 cm on the map equals 3km in reality?

1cm/3Km → 1cm/3000m → 1cm/300000cm→ 1:300000

E.g. 2 If we have a drawing paper that is 14x18 cm and we want to draw a piece of land on it that has dimensions 200m x 300m.

What is the suitable scale for drawing?

First leave 1cm from all sides of the paper as the map frame, so the paper dimensions become 12x16 cm

The scale of the width of the paper is

(12 cm)/(200m x 100cm)=(1)/1666

The scale of the length of the paper is

(16 cm)/(300m x 100cm)= =1/1875

The smaller scale is : 1/1875

The scale gets rounded so we would have

1/2000

The length of the map is:

300x100/2000=15 cm
The width of the map is
200x100/2000=10 cm
E.g. 3 what is meant by planning when we consider map design?
Answer: Planning includes deciding what information will be included and choosing a projection, the scale, and the type of symbols.

E.g. 4 what is meant by layout when we consider map design?
Answer: Layout involves decisions such as “Where should I place the title, where should the legend and scale go?
Multiple choice questions:

E.g. 5 Every element of the map has …… . These factors should be distributed evenly about the optical center of the page.
☐visual height ☐optical center ☒visual weight
☐balance

E.g. 6 It is the difference between light and dark, thick and thin, heavy and light; What is it?
☐Balance ☒contrast ☐Order ☐Clarity

2.Practical part

Q1:
Open **symbology. mxd** under **D:\2nd trial 2018**
a) Symbolize the map of Gozo island based on the field **SUMMARY_DE** (categorical attributes).
-Save your work

Q2:
Open **join.mxd** under **D:\2nd trial 2018**
a) Add table **Roadcodes.dbf** to **join.mxd;** Find **Roadcodes.dbf** under **D:\2nd trial 2018\Data**.
b) Join table **Roadcodes.dbf** to the layer **STR** in the map of **Gozo** Island using a field called **FEATCO** in its attribute table, then write down the procedure.
-Save your work

Q3:
Open **world.mxd** under **D:\2nd trial 2018**
a) Create a report for selected world countries and include fields: **CNTRY_NAME, POP_CNTRY, CURR_TYPE, CURR_CODE** and **SQKM** in the report.
b) Make sure sort POP_CNTRY descending.
c) Title your report **Top Industrial Countries.**

-Save your report in **D:\2nd trial 2018** and name it **report.**

Q4:
In ArcMap open **symbology.mxd** under **D:\Final GA\1**

a) Add shape file **world** from **D:\Final GA\1\data\symbology.mdb**

b) Symbolize the map of world based on the field **ADMIN**. For color ramp use “Terra Tones” as your color theme.
-Save your work

Q5: (30 Marks)
In ArcMap open **relate.mxd** under **D:\Final GA\1**
a) Relate **Metals.dbf** table to layer Pits_75 and use **IDNUMBER** as common field.
b) Using relate select pits that are contaminated with **Zn**.

Q6:
In ArcMap Open **Hungary.mxd** under **D:\Final GA\1**
a) In the map of Hungary select **villages** which have population more than **1000.**
b) Write down the query here.

Extra notes:

External Evaluator

This course book is reviewed by (Hemn Saheed Ahmed) as he is lecturer in Mechanical department in Hawler Institute. He assessed and approved all content of the Engineering Drawing subject as he admitted the course book is almost covered the several terms of Engineering Drawing in both theoretical and practical aspects. The course can be presented in the classes for entire curriculum year.

Hemn Saeed Ahmad
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