

Module (Course Syllabus) Catalogue 2020-2021

College/ Institute	Erbil Technology College	
Department	Surveying Department	
Module Name	Cartography and GIS	
Module Code	CAG302	
Semester	Third	
Credits	10	
Module type	Prerequisite <input type="checkbox"/>	Core * <input type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours		
Weekly hours (Theory)	(2)hr Class	(69)hr Workload
Weekly hours (Practical)	(3)hr Class	(110)hr Workload
Lecturer (Theory)	Muhsin Khalid	
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Lecturer (Practical)	Sadiq Ramazan Younes	
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Course Book

<p>Course Description</p>	<p>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.</p> <p>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.</p>
<p>Course objectives</p>	<p>The course aims to achieve following objectives:</p> <ul style="list-style-type: none"> • 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
<p>Student's obligation</p>	<p>The students are required to: -Attend lectures; write necessary notes Continuously follow the lectures, submits required homework and classwork.</p>
<p>Required Learning Materials</p>	<p>Different methods of teaching will be used:</p> <ol style="list-style-type: none"> 1- Power point presentations. 2- Explanation on the board. 3- Practical exercises using GIS.
<p>Assessment scheme</p>	<p>16% Mid Term (Theory and practical) 4% Quiz 40% Assignment (report, paper, homework, seminar..) 25% final practical 15% final theory</p>
<p>Specific learning outcome:</p>	<p>At the end of the course students should be able to:</p> <ol style="list-style-type: none"> 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
<p>Course References:</p>	<p>Principles of Cartography by: Robinson, A. H., Sale R.D., Mossison J., L. and Meahrck P. H. C</p> <ul style="list-style-type: none"> ▪ 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.	1	
An introduction to cartography and general terms.	2	
An introduction to cartography and general terms	3	
Different map types and purpose of using them	4	
Standard map features	5	
Standard map features, map title	6	
Standard map features, map scale	7	
Map scales conversion	8	
How to choose a suitable scale for the map?	9	
Map orientation and legend	10	
Map and symbols	11	
Symbols classification	12	
Map generalization	13	
Practical example on how to generalize a map	14	
Using text in maps	15	
Practical Topics	Week	Learning Outcome
1-Introduction: course structure and	1	The concept behind GIS
2-Starting with ArcMap UI;starting a new project, creating a Dataframe	2	Learning ArcMap UI
3-Starting with ArcCatalog; Learning main tasks in ArcCatalog	3	Learning ArcCatalog UI
4-Importing data into ArcMap; two methods, excel sheet and manual and labeling features	4	Importing Data into GIS
5-Importing base map and Georeferencing, labelling features	5	Georeferencing
6-Creating feature classes, starting digitizing polygons	6	Making feature classes

7- digitizing polygons	7	Learning digitizing
8-Digitizing points and lines	8	Learning digitizing
9-Adding fields and adding data into the field	9	Adding attributes to data
10-Adding fields and adding data into the field	10	Adding attributes to data
11- Labeling features and doing symbology for lines and points	11	Learning symbology
12- Labeling features and doing symbology polygons	12	Learning symbology
13-Learning layout UI, adding map title, map scale, map legend, and orientation	13	Adding standard map features
14-Adding final touches and comparing map layout and map planning concepts	14	Map layout vs Map planning
15-Preparing map for print, or exporting it as pdf	15	Printing map

Questions Example Design

1. Theoretical part

19. Examinations

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

$$1\text{cm}/3\text{Km} \rightarrow 1\text{cm}/3000\text{m} \rightarrow 1\text{cm}/300000\text{cm} \rightarrow 1:300000$$

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

$$(12\text{ cm})/(200\text{m} \times 100\text{cm})=(1)/1666$$

The scale of the length of the paper is

$$(16\text{ cm})/(300\text{m} \times 100\text{cm})= =1/1875$$

The smaller scale is : 1/1875

The scale gets rounded so we would have
1/2000

The length of the map is:
 $300 \times 100 / 2000 = 15 \text{ cm}$

The width of the map is
 $200 \times 100 / 2000 = 10 \text{ cm}$

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 (Hayman Saaed Ahmad) as he is lecturer in Surveying department in Technology college. He assessed and approved all content of the Cartography and GIS subject as he admitted the course book is almost covered the several terms of Cartography and GIS in both theoretical and practical (laboratory) aspects. The course can be presented in the classes for entire curriculum year

Hayman Saaed Ahmad
Signature

