

Theoretical and practical course plan form - Ilam University of Medical Sciences

Introduction of the course in the section 2020-2021

School: Health Department: Department of Biology and Carrier Control

* Name and course number: Application of geographical system in health

* Field and degree: Biology and Carrier Control-Bachelor of Semester 4

* Day and time of holding: theoretical and practical Saturday 4-2

* Venue: theoretical in class number 11 and practical on the university website

* Number and type of unit: 1 theory unit

* Prerequisite courses: Computer and Geographical Pathobiology of Iran

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General purpose of the lesson: Familiarity with the GIS and how to work with ArcGIS software, which includes general objectives in each session:

- 1- History and familiarity with the basics of GIS
- 2- Introducing the structures of the system components and its pillars
- 3- Types of data and how to collect
- 4- Foresight, positioning and...
- 5- Coordinate and image systems and introduction of geographical feature
- 6- Application of GIS in public health and entomology and creation of functions
- 7- How to analyze data and manage descriptive and spatial data
- 8- Preparing the system and managing it and preparing a suitable output
- 9- Familiarity and work with GPS
- 10- Familiarity with ARC GIS and ARC Catalog environments

11- Familiarity with how to enter graphic and descriptive data- Coordinate and image systems and introduction of geographical features

* **Specific or partial objectives of the lesson:** The specific objective is better to be written behaviorally (the behavioral objective has the audience, behavioral verb, degree and criteria of the conditions).

1- History and familiarity with the basics of GIS

The student is able to:

- 1- Tell the history of GIS in the world.
- 2- Explain the stages of the student's journey.
- 3- Explain the history of GIS in Iran.
- 4- Explain the types of GIS and define them by giving an example

2- Familiarity with different levels of GIS

The student is able to:

- 1- Explain Arc GIS software and its different parts in general.
- 2- Explain the duties of the system
- 3-Recognize Arc catalog-3 and state its tasks.
- 4-Recognize 3 and state its duties.
- 5-Recognize Arc reader-4 and state its tasks.
- 6-Know Arc map-5 and its functions.
- 7-Know Arc globe-6 and its functions.

3- Introducing the structures of the system components and its pillars

The student is able to:

- 1- Describe the structure of the system.
- 2- Explain the different components of the system.
- 3- Describe the pillars of the system.
- 4- Explain the necessary software for the system and its types with an example.
- 5-Describe the input and output hardware and the necessary analysis for the system with an example.
- 6- Explain the data and information and their differences.

7. Explain data management.
- 8- Analyze the data and explain its methods.

Define Georeferencing-9 and Geodatabase.

4- Install Arc GIS software

The student is able to:

- 1- Install the software.

5- Introducing the functions of Arc map

The student is able to:

- 1- Explain the difference between files with mxd and shp extensions.
- 2- Explain how to enter data into the arc map environment.
- 3- Introduce the different toolbars of arc map and explain how to summon them.
- 4- Create a new framework.
- 5- Create signs for the map.
- 6- Make a guide for the map.

6-Data types and how to collect

The student is able to:

- 1- Define raster and vector data and name their types.
2. Describe descriptive data.
- 3- Express the types of geometric data.
- 4- Explain how to extract raster and vector data by giving an example.

7- Familiarity with Tools toolbar

The student is able to:

- 1- Work with Zoom in, Zoom out tools.
2. Describe the full extent function.
- 3- Describe the methods of summoning descriptive data of map signs.
- 4-Describe the function of Identify.

5. Explain the select Feature function.

8- Data extraction

The student is able to:

- 1- Explain how to extract raster data.
- 2- Explain how to extract vector data.
- 3- Explain ground mapping.

9- How to analyze data and manage descriptive and spatial data

The student is able to:

1. Describe the types of data analysis methods.
- 2- Explain how to create a database.
- 3- Explain the methods of creating secondary data and converting them.
- 4- Explain the types of data formats.

10- System preparation and management and preparation of appropriate output

The student is able to:

- 1- Prepare the elements of the system and launch it.
- 2- Prepare the data and modify it to enter the system.
- 3- Explain the preparation methods.
- 4- Describe the output hardware and software.
- 5- Explain how to create a suitable layout.
- 6- Provide a suitable output from the system.

11- Working with tables

The student is able to:

- 1- Summon the descriptive table.
- 2- Create an empty column in the table.
- 3- Work with the editor toolbar.
- 4- Record descriptive data in the table.

12-Types of classification in Arc map environment

The student is able to:

- 1- Explain the properties work
- 2- Classify using the Feature menu.
- 3- Classify with Categories submenus.
- 4- Classify with Quantities submenus.
- 5- Classify with chart submenus.

13-Statistical analysis and charting

The student is able to:

- 1- Explain the function of calculate Geometry.
- 2- Calculate population density.
- 3- Explain how to write a formula.
- 4- Draw a diagram.
- 5- Classify the map using color differences.

14- Familiarity with GPS

The student is able to:

- 1- Describe the components of the positioning system.
- 2- Tell the GPS history.
- 3- Describe the positioning system.
4. Name the countries that have the positioning system.
5. Describe the types of data sent by satellite.

15. Record the collected data

The student is able to:

- 1- Explain how to record the data collected by the GPS device to the Arc map environment.
- 2- Change the symbols on the map.

- 2- Change the color, shape and size of geometric data.

16-- Coordinate and image systems and introduction of geographical features

The student is able to:

- 1- Explain the types of coordinate systems.
- 2- Explain the projection and images of Lambert and....
- 3- Explain the UTM coordinate system and its types.
- 4- Explain the geographical coordinate system of degrees and and its types.

17-Working with geometric data

The student is able to:

- 1- Correct the geometric data on the map.
- 2- Correct a linear complication.
- 3- Define angle and size for geometric shapes.
- 4- Define the scale map.

18- Familiarity with the map

The student is able to:

- 1- Explain the types of maps.
- 2- Express the scales.
- 3- Describe its features on the map.

19- Application of GIS in entomology and creation of functions

The student is able to:

- 1- Describe the different applications of the information system.
- 2- Define Health GIS, Describe the tasks of HGIS.
- 3-Explain the applications of the system in entomology.

20-Geo-referencing

The student is able to:

- 1- Insert a paper map into the software.

2- Define coordinates for the system map.

3- Georeference the map.

4-Describe the function of Rectify.

21-Functions

The student is able to:

1- Explain neighborhood functions.

2. Explain the functions of neighborhood functions.

3- Explain analytical functions.

4-Describe the functions of analytical functions

22-Create point file shape

The student is able to:

1- Shape to create a point file.

2- Record new points in Arc map environment.

3- Enter the descriptive information of the points.

4- Define appropriate symbol points.

5- Classify.

23. Create a linear file shape

The student is able to:

1- Shape to create a linear file.

2- Draw linear data in arc map environment.

3- Record descriptive information for them.

4- Explain the snapping function.

5- Classify linear data.

24-Create a polygon file shape

The student is able to:

1- Create a polygon file shape.

- 2- Draw a polygon in Arc map environment.
- 3- Draw a new framework.
- 4- Overlap.
- 5- Draw map signs.
- 6- Get a suitable output from the map.

25-Familiarity with spatial analysis and 3D analysis

The student is able to:

- 1- Explain the function of spatial analysis.
- 2- Explain the function of 3D analysis.

26- Spatial and temporal analysis

The student is able to:

1. Perform a spatial analysis of the distribution of a disease carrier.
2. Perform a spatial and temporal analysis of the distribution of a disease.

*** Student duties:** (Student homework during the semester):

- 1- Preparing to ask questions from the topics presented in previous sessions
- 3- Carrying out a project and preparing a suitable input and output from the system

*** Main resources of the course:** Main resources (by observing the principles of source writing and giving an address for their preparation, including library, bookstore, internet ...)

- 1- GIS basics. Hope TT Fortress
2. Geographic information systems and its application in the environment. Dr. Noorollahi
3. Application of GIS in health. Dr. Tabatabai

3-Burrough, P. A. and McDonnell, R. A. (1998), Principles of Geographical Information Systems, Oxford University

Press, Oxford.

4-Rostami, Sh. And Parolin, B. (2004), Travel-disadvantaged groups and the concept of transportation needs in rural

NSW, Global Community Initiatives, Burlington, Vermont, USA.

* **Teaching method + teaching aids used:** using projectors, computers, slides as well as lectures and questions and answers or participation

* **Methods and time of assessment and evaluation of students and bar related to each value B:** (Type of exams in terms of how to design a question - loading - time of exams and assignments should be mentioned

Method	Score	Date	Time
Provide classroom activities and problem analysis	2	During the semester	
performing project	5		
End-of-semester descriptive and four-choice exam	13	End of semester	

Schedule of presentation of the curriculum for the application of the geographical system in the health of the second semester 2020-2021

Session	Time	Topic	Necessary preparation of students before the start of the class
1	2-4	History and familiarity with the basics of GIS	
2		Familiarity with different levels of GIS	
3		Introduction of system structures, its components and pillars	
4		Install Arc GIS software	
5		Introducing the functions of Arc map	
6		Data types and how to collect	
7		Familiarity with the Tools toolbar	
8		extracting the data	
9		How to analyze data and manage descriptive and spatial data	
10		System preparation and management and preparation of appropriate output	
11		Working with tables	
12		Types of classification in Arc map environment	
13		Statistical analysis and charting	
14		Record the collected data	
15		Coordinate and image systems and introduction of geographical features	
16		Working with geometric data	
17		Application of GIS in public health and entomology	

		and creation of functions	
18		Geo reference	
19		Create dotted and linear file shapes	
20		Create a polygon file shape	
21		Familiarity with spatial analysis and 3D analysis	