Module (Course Syllabus) Catalogue

2024-2025

College/ Institute	College of Erbil Technical Engineering	
Department	Technical Information System Engineering	
Module Name	Geographical Information Systems	
Module Code	GIS703	
Degree	Technical Diploma ☐ Bachler ■	
Semester	Seven	
Qualification		
Scientific Title	Asst. Lecturer	
ECTS (Credits)	6	
Module type	Prerequisite ☐ Core ■ Assist. ☐	
Weekly hours	2	Total Workload=(81) hrs
Weekly hours (Theory)	(0)hr Class	(0)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	(81)Total hrs Workload
Number of Weeks	12	
Lecturer (Theory)		
E-Mail & Mobile NO.		
Lecturer (Practical)	Ashna Abdulrahaman Kareem & Hawkar Jabbar	
E-Mail & Mobile NO.	ashna.kareem@epu.edu.iq & hawkar.jabar@epu.edu.iq	
Websites	https://moodle.epu.edu.iq/course/view.php?id=589	

Course Book

<table>
<tr><td>Course Description</td><td colspan="5">GIS (Geographic Information Systems) is a computer-based tool for analyzing and solving real-world problems using spatial (geographic) data. This course is designed to teach students the fundamental principles and techniques of GIS. The lab material will cover GIS data collection, entry, storage, analysis, and output using ArcGIS.</td></tr>
<tr><td>Course objectives</td><td colspan="5">Students will learn how to compile, analyze, and present geospatial data while emphasizing the value of visual communication. Students will learn these basic geospatial concepts while working with ESRI’s ArcGIS software.</td></tr>
<tr><td>Student's obligation</td><td colspan="5">Student's obligation in the computer application course is:
•Attendance in the all lectures.
•One or more quizzes in each course.
•Exam in end of first course and second course.</td></tr>
<tr><td>Required Learning Materials</td><td colspan="5">•Using data show, white board and PowerPoint, Testing in department’s Laboratory.
•Publish all lectures and notes in Moodle Platform.</td></tr>
<tr><td rowspan="4">Evaluation</td><td colspan="2">Task</td><td>Weight (Marks)</td><td>Due Week</td><td>Relevant Learning Outcome</td></tr>
<tr><td colspan="2">Paper Review</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Assignments</td><td>Homework</td><td>8</td><td>4</td><td>• Design anywhere as you like by using ArcMap.
• Prepare first assignment to print.
• Take few GPS coordinates (5-10 real points) near your residing area then put those points into Kurdistan Map in ArcMap and export it as a point shapefile.</td></tr>
<tr><td>Class Activity</td><td>2</td><td></td><td>Be active during class</td></tr>
</table>

		Report	8	4	• Create a report according to your areas of interest in GIS. • Prepare a report on how you did the third assignment.

		Seminar	10	1	Prepare Seminar for their projects.
	Quiz		8	2	
	Lab Midterm Exam		24	1	
	Lab Final Exam		40	1	
	Total		100		

Specific learning outcome:	Students will learn how to compile, analyze, and present geospatial data while emphasizing the value of visual communication. Students will learn these basic geospatial concepts while working with ESRI's ArcGIS software. By the end of this course, the student will be able to: ✓ Will be able to describe what geography and GIS are; ✓ Will understand the importance of scale, projection, and coordinate systems in GIS; ✓ Will understand vector and raster data structures and the appropriate use of each of these data structures; ✓ Will understand the basics of data capture, storage, analysis, and output in a GIS; and ✓ Will understand typical uses of GIS in business, government, and resource management.
Course References:	• Getting to Know Arcgis Desktop: by Michael Law

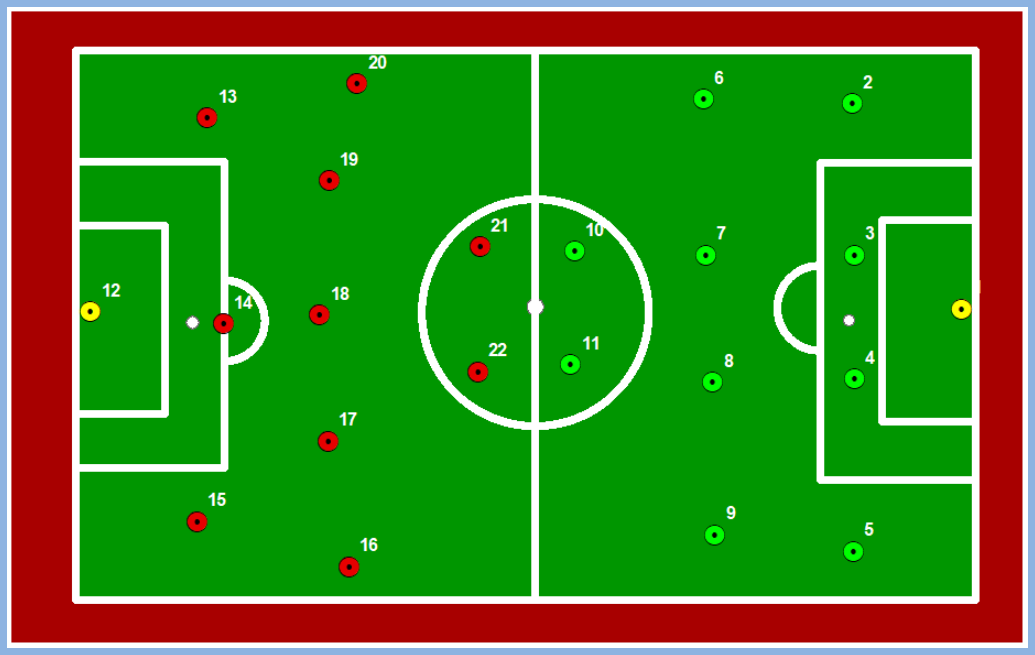
Course topics (Practical)	Week	Learning Outcome
Course book	1	• Review Syllabus, • Course Rationale and Objectives
Introduction to GIS	2	• What is **Geographic Information System (GIS)**? • GIS Components • What can GIS Do? • What are the types of GIS data? • Vector VS Raster. • What are GIS Functions? • Exploring GIS concepts using ArcGIS
Geoprocessing	3	• Understand how GIS professionals utilize geoprocessing to prepare and analyze data. • Exploring the Geobrowser with students and demonstrating how to collect data from free sources in the classroom as a practical lesson.
GIS Interface	4&5	• Get Started with Arcmap and working with Vector and Raster data • Become familiar with ArcGIS software • Become familiar with ArcMap menus, toolbars, and map elements; and • Learn how to explore data using ArcMap and ArcCatalog.
Creating Geodatabase	6	• Create a Geodatabase, select the appropriate type for our project, and create layers, edit data geometry, snap, trace, and edit attributes.

Tables, Data Types, Structures, and Formats	7&8	Identify basic structure and data types for tables stored in a GIS; Identify common tabular formats imported into a GIS; and Learn how to perform a join and relate between two tables and a feature class and a table. Recognize the different data types and structure available to represent geospatial and tabular data; Learn how to select the most appropriate data type and structure to support your objective; Discuss the value of smart feature in planning applications; Understand the role of subtypes, relationships, domains, validation rules, and topology; Recognize the most common GIS data formats; Explore different data types, structures, and formats using ArcGIS; and Learn how to develop a geospatial inventory.
Spatial Queries & Attribute Queries	9	• Understand spatial relationships and how to query them in GIS; • Understand how, when, and why to use definition queries; • Learn how to perform a multi-step spatial query; and • Learn how to join attributes by location. • Use ArcGIS to find and query attributes; • Introduce selection methodologies available in ArcGIS; Use Structured Query Language (SQL) to execute standard database queries; and • Create summary reports based on attribute queries.
Data Creation, Collection, and Quality maps for print out	10	• Be able to identify the geospatial data required to support a process; • Understand the differences between utilizing existing data and creating your own; Learn where to find data; • Understand when you need to create data; • Recognize when it is appropriate to use a pilot project; Learn how to create vector data; • Learn how to create attribute data; Back up your data early and often; • Understand the relationship between error, accuracy, and precision; • Discuss opportunities to introduce error and how to mitigate them; • Be able to distinguish between quality control and quality assurance;

		• Learn how to establish and audit trail; and • Discuss the importance of good data management. • Learn to know how to ❖ Print layouts ❖ Set up a layout ❖ Add and manage elements ❖ Manage templates
Seminar	11 & 12	all students should Develop about features and how they reflect geographical features, as well as qualities and their descriptions. and Explore how features and characteristics are linked and shown in a GIS, and also print the final output for mapping.

Questions Example Design

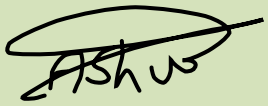
Q1\ Create this design in ArcGIS?



Extra notes:

External Evaluator

I confirm that the syllabus given the attached course book is sufficient and covers the required areas needed for the students.



Signature

Lecturer: Ashna Abdulrahman Kareem Zada

11-09-2024