# Module (Course Syllabus) Catalogue

# 2023-2024

| | | | | |
|---|---|---|---|---|
| **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** | **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 Abdulrahamn kareem** | | | |
| **E-Mail & Mobile NO.** | **ashna.kareem@epu.edu.iq** | | | |
| **Websites** | | | | |

# Course Book

| | |
|---|---|
| **Course Description** | GIS (Geographic Information Systems) is a computer-based tool that uses spatial (geographic) data to analyze and solve realworld problems. This course is designed to introduce the student to the basic principles and techniques of GIS. The lab material will emphasize GIS data collection, entry, storage, analysis, and output using ArcGIS. |
| **Course objectives** | 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. |
| **Student's obligation** | Student's obligation in the computer application course is:<br>•Attendance in the all lectures.<br>•One or more quizzes in each course.<br>•Exam in end of first course and second course. |
| **Required Learning Materials** | •Using data show, white board and PowerPoint, Testing in department's Laboratory.<br>•Publish all lectures and notes in Moodle Platform. |

**Evaluation**

| | Task | Weight (Marks) | Due Week | Relevant Learning Outcome |
|---|---|---|---|---|
| | Paper Review | | | |
| Assignments | Homework | %10 | 4 | Design anywhere as you like by using ArcMap.<br>Prepare first assignment to print.<br>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. |
| | Class Activity | %2 | | Be active during class |
| | Report | %16 | 4 | Prepare a report to any topics of GIS.<br>Prepare a report to any topics of GIS.<br>Prepare a report on how you did the third assignment. |

| | | | | | |
|---|---|---|---|---|---|
| | | Project | %16 | 2 | Create any project by ArcGIS. |
| | | | | | Create poster about any topics of GIS. |
| | | Seminar | %16 | 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.<br><br>By the end of this course, the student will be able to:<br><br>• Will be able to describe what geography and GIS are;<br>• Will understand the importance of scale, projection, and coordinate systems in GIS;<br>• Will understand vector and raster data structures and the appropriate use of each of these data structures;<br>• Will understand the basics of data capture, storage, analysis, and output in a GIS; and<br>• 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** |
|---|---|---|

| | | |
|---|---|---|
| Introduction to GIS | 1 | Review Syllabus, Course Rationale, and Objectives;<br>Introduce GIS;<br>Become familiar with ArcGIS software<br>Become familiar with ArcMap menus, toolbars, and map elements; and<br>Learn how to explore data using ArcMap and ArcCatalog. |

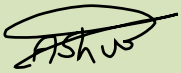
| | | |
|---|---|---|
| Envisioning Information | 2&3 | Introduce the concept of envisioning information;<br>Understand the value of maps;<br>Learn how to symbolize features and rasters in ArcGIS; and<br>Learn how to classify features and rasters in ArcGIS. |
| Features and Attributes | 4&5 | Understand what features are and how they model (i.e. represent) geospatial features;<br>Understand what attributes are and how the describe geospatial features; and<br>Explore how features and attributes are linked and displayed in a GIS. |
| Attribute Queries | 6 | Use ArcGIS to find and query attributes;<br>Introduce selection methodologies available in ArcGIS;<br>Use Structured Query Language (SQL) to execute standard database queries; and<br>Create summary reports based on attribute queries. |
| Tables, Data Types, Structures, and Formats | 7&8 | Identify basic structure and data types for tables stored in a GIS;<br>Identify common tabular formats imported into a GIS; and<br>Learn how to perform a join and relate between two tables and a feature class and a table.<br>Recognize the different data types and structure available to represent geospatial and tabular data;<br>Learn how to select the most appropriate data type and structure to support your objective;<br>Discuss the value of smart feature in planning applications;<br>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<br>Learn how to develop a geospatial inventory. |

| | | |
|---|---|---|
| Spatial Queries | 9 | Understand spatial relationships and how to query them in GIS;<br>Understand how, when, and why to use definition queries;<br>Learn how to perform a multi-step spatial query; and<br>Learn how to join attributes by location. |
| Geoprocessing | 10 | Understand how GIS professionals utilize geoprocessing to prepare and analyze data. |
| Data Creation, Collection, and Quality | 11&12 | Be able to identify the geospatial data required to support a process;<br>Understand the differences between utilizing existing |
| | | data and creating your own;<br>Learn where to find data;<br>Understand when you need to create data;<br>Recognize when it is appropriate to use a pilot project;<br>Learn how to create vector data;<br>Learn how to create attribute data;<br>Back up your data early and often;<br>Understand the relationship between error, accuracy, and precision;<br>Discuss opportunities to introduce error and how to mitigate them;<br>Be able to distinguish between quality control and quality assurance;<br>Learn how to establish and audit trail; and<br>Discuss the importance of good data management. |

**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 Abdulrahamn Kareem Zada*

*10-Sep-2023*