



University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Computing and Information Technology
Program: B. Sc. In Information Systems

Course title	Geographic Information Systems
Course code	IS477

Form no. (11-A)

Knowledge and skills matrix for a course

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
Introduction to GIS; background and an overview	1	<ul style="list-style-type: none"> Define GIS and its components Learn GIS Applications Identify different model: Vector and Raster Learn GIS Operations 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Introduction to ArcCatalog Introduction to ArcMap Use ArcMap software package to work with map layers and change their scale Measure Map features 	G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
Coordinate Systems	2	<ul style="list-style-type: none"> Learn coordinate systems types and known standards 	<ul style="list-style-type: none"> Differentiate between Projected and Geographic coordinate systems 	<ul style="list-style-type: none"> Use Opensource GIS software to change map projections Project a Feature Class from a Geographic to a Projected Coordinate System Import a Coordinate System Project a Shapefile by Using a Predefined Coordinate System Convert from One Coordinate System to 	G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. <ul style="list-style-type: none"> G7. Show the use of general computing facilities.

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
				Another	
Vector Data Model	3	<ul style="list-style-type: none"> Learn Geodatabase, Shapefile, and Coverage for Software concepts Understand the representation of simple features Define Topology Identify the Object-Based Data Model Define ArcObjects Learn the representation of composite features 	<ul style="list-style-type: none"> Distinguish vector data model from raster data model Distinguish Vectorization from Rasterization 	<ul style="list-style-type: none"> Use Opensource GIS software to represent features in a vector model Examine the data file structure of Coverage and Shapefile Create File Geodatabase, Feature Dataset, and Feature Class Convert a Shapefile to a Personal Geodatabase Feature Class 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
Raster Data Model	4	<ul style="list-style-type: none"> Identify the elements of the Raster Data Model Learn the rules in determining a categorical cell value 	<ul style="list-style-type: none"> Distinguish Vector Data Model from Raster Data Model Distinguish Vectorization from Rasterization 	<ul style="list-style-type: none"> View USGS DEM Data View a Satellite Image in ArcMap 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
GIS Data Acquisition	5	<ul style="list-style-type: none"> Identify the different source of existing GIS data Learn metadata standards 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Download and Process DEM and DLG from the Internet Digitize On-Screen in ArcMap 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
Geometric Transformation	6	<ul style="list-style-type: none"> Learn Geometric Transformation methods Understand resampling methods 	<ul style="list-style-type: none"> Differentiate between the diverse transformation and resampling methods 		<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
7 th week Examination	7	<ul style="list-style-type: none"> 90 minute exam to test students understanding of all the concepts introduced in chapters 1, 2, 3, 4, 5 and 6 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Spatial Data Editing	8	<ul style="list-style-type: none"> Identify location errors Understand Spatial Data Accuracy Standards Recognize Topological Errors and editing Learn Topological and Non-Topological Editing in Opensource GIS software 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Edit a Shapefile Use Topology Rule to Fix Dangles 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
Attribute Data Input And Management	9	<ul style="list-style-type: none"> Recognize types of tables and attribute data Learn the Relational Data Model and its concepts: Joins, Relates, and Relationship Classes Identify the methods of data entry Understand manipulation of fields and attribute data 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Enter Attribute Data of a Geodatabase Feature Class Create New Attribute by Data Computation 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
Data Display And Cartography	10	<ul style="list-style-type: none"> Learn Cartographic Representation Define Typography 	<ul style="list-style-type: none"> Classify Types of Quantitative Maps Apply Map Design 	<ul style="list-style-type: none"> Use Graduated Symbols, Line Symbols, Highway Shield Symbols, and Text Symbols Label Streams Edit map view layout and design the final map Add map legend 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
Data Exploration	11	<ul style="list-style-type: none"> Understand Data Visualization, Geovisualization, and Descriptive Statistics Learn Raster Data Query 	<ul style="list-style-type: none"> Interpret query expressions and the different Query Methods in Opensource GIS software 	<ul style="list-style-type: none"> Create feature attribute queries in Opensource GIS software Execute location queries in Opensource GIS software Build buffers and make spatial queries in 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
				Opensource GIS software	
12 th week Examination	12	<ul style="list-style-type: none"> 90 minute exam to test students understanding of all the concepts introduced in chapters 7, 8, 9, and 10. 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Vector Data Analysis	13	<ul style="list-style-type: none"> Identify variations in and applications of Buffering Understand Overlay methods in Opensource GIS software Recognize error propagation in Overlay 	<ul style="list-style-type: none"> Perform pattern analysis and map manipulation 	<ul style="list-style-type: none"> Perform Buffering and Overlay Measure Distances Between Points and Lines Compute General and Local G-statistics 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
Raster Data Analysis	14	<ul style="list-style-type: none"> Understand Local Operations in Opensource GIS software and its applicaitons Learn Neighborhood Operations in Opensource GIS software Identify Zonal Operations in Opensource GIS software and its applications Define other Raster Data Management: Extraction and Generalization 	<ul style="list-style-type: none"> Compare between Vector- and Raster-Based Data Analysis: Overlay and Buffering 	<ul style="list-style-type: none"> 	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <ul style="list-style-type: none"> G7. Show the use of general computing facilities.
Summary of GIS	15	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

Course Instructor

Head of Department

Name:

Name: