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EUROPEAN COMPUTER DRIVING LICENCE
GIS Systems
Syllabus

Purpose

This document details the syllabus for *ECDL GIS Module 2 – GIS Systems*. The syllabus describes, through learning outcomes, the knowledge and skills that a candidate for ECDL GIS should possess. The syllabus also provides the basis for the theory and practice-based test in this module.

Note

The official version of the syllabus for ECDL GIS Module 2 – GIS Systems Version 1.2 can be found on the web site www.ecdl.it, and it was released in January 2007.

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GIS Module 2 – GIS Systems

The following is the syllabus for Module 2 of the GIS certification and provides the basis for the theory and/or practical test in this module domain.

Scopi del modulo

GIS Module 2 – GIS Systems aims to test the candidate's knowledge of GIS components, data models for the appropriate representation of real world objects in a GIS, the concept of topology, and spatial analysis applied to both raster and vector data which describe both continuous fields and discrete real world entities.

CATEGORY	KNOWLEDGE AREA	REF.	KNOWLEDGE ITEM
2.1 Introduction to GIS	<i>2.1.1 Basic concepts</i>	2.1.1.1	Understand the term and concept of GIS
		2.1.1.2	Understand the difference between GIS and Information Systems in general
		2.1.1.3	Know the principal GIS application areas
		2.1.1.4	Understand and distinguish between the components of a GIS
		2.1.1.5	Understand the principal functions of a GIS
	<i>2.1.2 Devices and file types specific of GIS</i>	2.1.2.1	Know the specific input devices used with GIS and the relevant technical characteristics that differentiate them (where applicable depending on the device: resolution, precision, colour range connector, management and use)
		2.1.2.2	Recognise the most common GIS file types and whether they are vector or raster format
		<i>2.1.3 GIS data and data sources</i>	2.1.3.1
	2.1.3.2		Identify the main data sources that can be used in GIS, such as: remotely sensed data, cadastral, paper and digital maps, socio-economic data
	2.1.3.3		Understand the concept of spatial data
	2.1.3.4		Identify the different types of attributes (such as nominal, ordinal, interval, ratio)
	2.1.3.5		Know the main geographical data formats (such as coverage, geodatabase, shapefile, grid, dxf, dwg, geotiff, GML)
	<i>2.1.4 Scale in GIS</i>	2.1.4.1	Understand the concept of scale in GIS
	<i>2.1.5 Georeferencing</i>	2.1.5.1	Understand the concept of georeferencing
		2.1.5.2	Know how raster data can be georeferenced

CATEGORY	KNOWLEDGE AREA	REF.	KNOWLEDGE ITEM
		2.1.5.3	Know the function of a raster georeferencing file (World File)
2.2 Data Models	<i>2.2.1 Modelling of the Real World</i>	2.2.1.1	Know what a data model is.
		2.2.1.2	Understand the process of creating a data model.
		2.2.1.3	Understand the idea of conceptual, logical and physical models
	<i>2.2.2 Continuous and discrete modelling of the real world</i>	2.2.2.1	Understand the representation of the real world via a vector model.
		2.2.2.2	Understand the representation of the real world via a raster model.
	<i>2.2.3 Topology</i>	2.2.3.1	Understand the concept of topology
		2.2.3.2	Understand the concepts of adjacency, connectivity and area (containment)
		2.2.3.3	Know how to differentiate between spaghetti (or CAD) vector data and topological vector data
		2.2.3.4	Understand the topological relationships of raster data (essentially based on the concept of adjacency/nearness)
	2.3 DBMS	<i>2.3.1 DBMS and GIS</i>	2.3.1.1
2.3.1.2			Understand the logical structure of a DBMS within GIS
2.3.1.3			Understand the principal operations to be carried out on data in a DBMS (selection, insertion, updating, deletion)
2.4 Data analysis	<i>2.4.1 Spatial Analysis</i>	2.4.1.1	Understand the main kinds of raster spatial analysis
		2.4.1.2	Understand the main kinds of single layer vector spatial analysis
		2.4.1.3	Understand the main kinds of multi-layer vector spatial analysis
		2.4.1.4	Know and differentiate the procedures for distance and area calculations in a vector and raster data modelling
	<i>2.4.2 Attributes based analysis</i>	2.4.2.1	Understand how to choose objects based on their attributes

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		2.4.2.2	Understand the use of relationships and links between tables
		2.4.2.3	Understand the key elements of statistics, such as, average, standard deviation, least squares, mean square deviation
		2.4.2.4	Distinguish between the main classification methods (such as quantile, standard deviation, natural breaks)
2.5 Thematic mapping	<i>2.5.1 Thematic representation</i>	2.5.1.1	Define the term thematic map
		2.5.1.2	List the key elements of a thematic map
		2.5.1.3	Distinguish between different types of thematic maps (such as choropleth, isopleth, proportional symbols, dot density)
		2.5.1.4	Understand the terms quantitative and qualitative maps.