DIGITAL MAPPING COURSE WITH ARCGIS 10 AND AUTOCAD MAP 3D

Arc GIS
ESRI

AUTODESK
MAP 3D

TYC GIS
Training
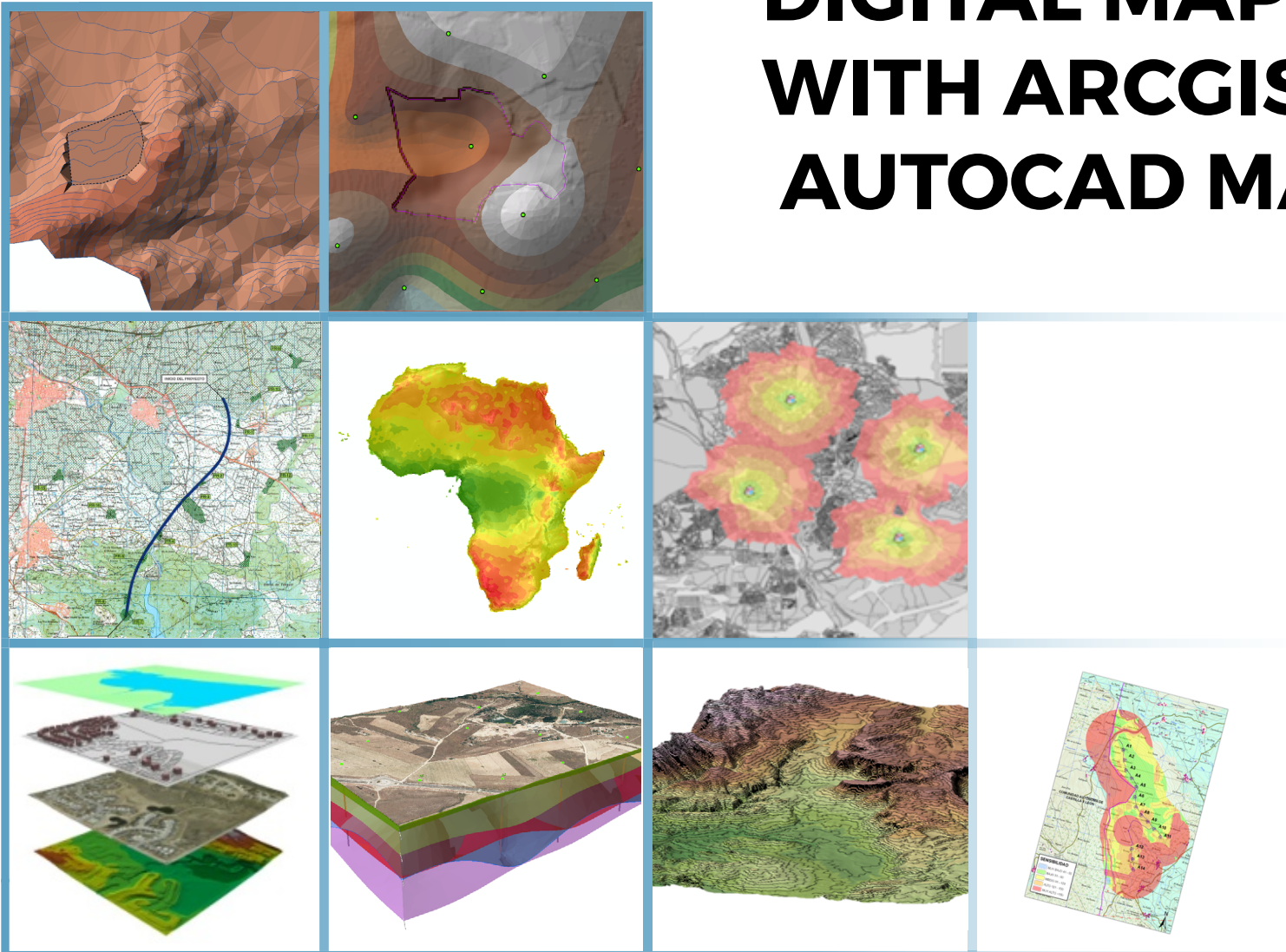
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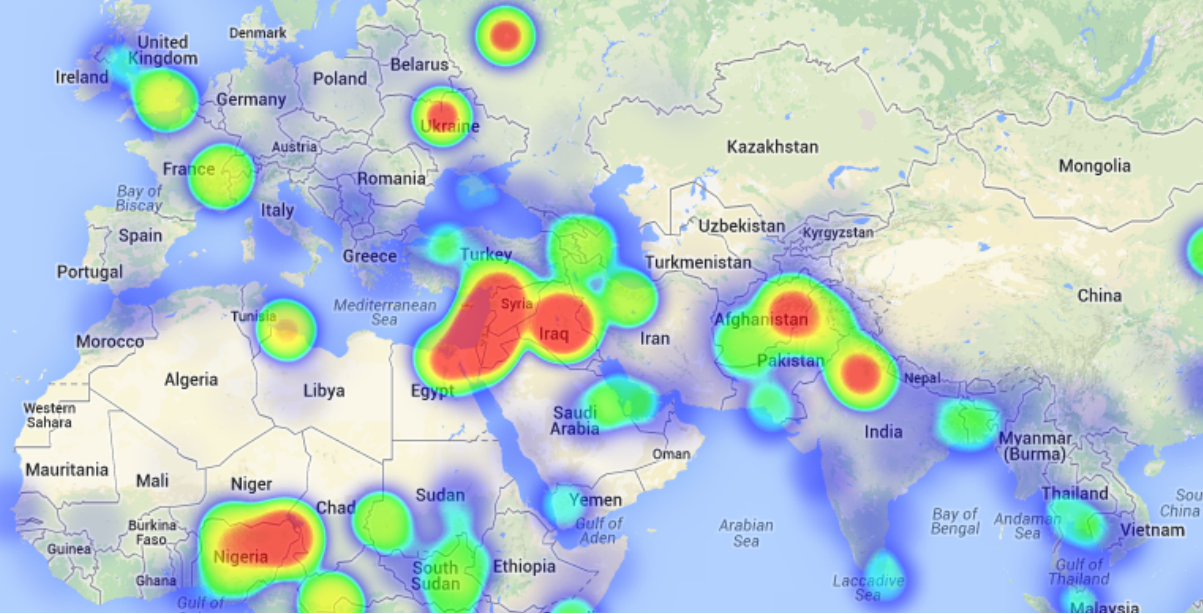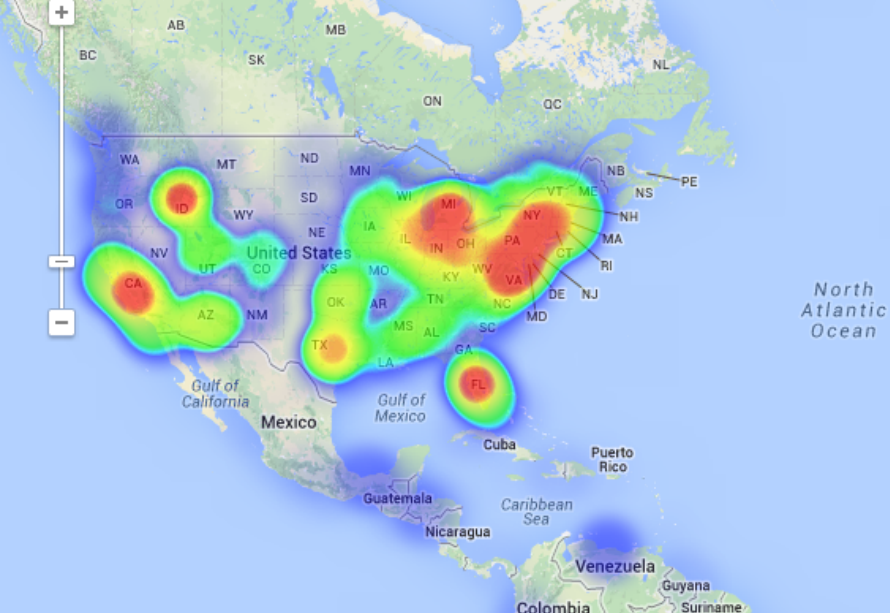
TRAINING OVERVIEW

The goal of the Digital Mapping course using ArcGIS and AutoCAD Map is, in addition to manage separately each program, explain the potentialities of each one and migrate data from one another, allowing students use the most adequate software for each situation.

The course is divided in three blocks.

Block I – ArcGIS Desktop will train students in the management of ArcGIS Desktop 10 focusing on the use and management of vector data models, their relation with data bases and in the creation of cartography.

Block II – Migrating data from GIS to CAD through the advanced use of geodatabase.

Block III – AutoCAD Map 3D will train students in the management of AutoCAD

Map 3D, facilitating their introduction to AutoCAD, from first steps to the creationand editing of objects, the use of geospatial tools and the generation of maps.

GOALS

· Learn about the importance and uses of Geographic Information systems (GIS) for the study and management of variables applied to a large number of professional sectors.

· Study CAD key tools for the creation of simple and complex drawings, required to produce plans.

· Comprehend the essential concepts for the specific management of ArcGIS and AutoCAD, as well as for Geographic Information Systems (GIS) in general.

· Introduce GIS key tools for the correct management of vector information and the elaboration of complex spatial analysis.

· Understand the integration of AutoCAD Map 3D with Geographic Information Systems and the management of geospatial tools.

· Acquire the knowledge to prepare, layout and deliver high-quality cartography.

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ONLINE FORMAT METHODOLOGY

The online format uses the online learning and technological platform Moodle, a telematics tool that works through the internet. It is a learning platform that provides students access to the training course content, fulfill the practical cases and consult the teaching staff, as well as availability to the resources and help at any moment.

The platform is available 24 hours a day, through which the student will be able to ask for help at any given moment. Instructors will reinforce the student´s autonomy during its training process, supporting and clarifying any possible doubts that may arise along the course.

Therefore, the course is carried out through different areas available on the online platform and where the student can search for training material, download information, complete the practical exercises and take assessments to verify the assimilated knowledge. The teachers will offer progressively the basic information needed to work towards the completion of a final practical case.

STUDENT PROFILES

This course is aimed at students and professionals related to engi-neering, biology, geology and environmental sciences interested in the application of Geographic information Systems to its profes-sional activities.
Important note: this course doesn't require previous ArcGIS Desktop knowledge.

INSTRUCTOR

Santiago Pardini Herranz

With a Bachelor´s degree in Environmental Sciences and a Specialist certificate in Geographic Information Systems from the Universidad Politecnica de Madrid (Spain), Santiago has more than 5 years experience as a GIS Consultant / Technician.

He has experience in the development of GIS studies for diverse types of projects: hydraulic infrastructures, lineal structures, wind and photovoltaic installations, mining activities, land use zoning, fauna studies, etc.

Alfonso Martínez Pérez

With a Bachelor's Degree in Biology by the Universidad Complutense of Madrid (Spain), Environmental area specialization, Alfonso is the Technical Director at the consulting firm Persea Environmental Solutions (Persea Soluciones Ambientales).

With specialised training in Autocad and Autocad applied to environmental management, he has extent experience in the development of cartography in GIS and CAD as well as in environmental impact studies and environmental integration for linear infrastructure projects, wind and photovoltaic installations, mining activities, spatial planning, fauna studies, etc

TRAINING PROGRAM

BLOCK I - ARCGIS DESKTOP

1 - INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS

Introduction.

Definition and basic concepts.

Uses of Geographic Information Systems.

Geographic information: vector data models, raster data models and other data models (CAD, TIN, etc.). Main features of each data module, advantages and disadvantages.

Introduction to ArcGIS Desktop: ArcMap, ArcCatalog, ArcToolbox, ArcScene and ArcGlobe.

Arcmap interface, extensions and tools.

Verification of the correct functioning of the software and assessment.

2 - VECTOR DATA MODEL. INFORMATION DISPLAY

Information layers: how to add layers, features and attribute tables.

Data tools: search and queries.

Selection tools: selection by attribute, selection by spatial location and information capture.

Layer symbology: simple symbology, by category, by quantity and through graphs.

Other display options: labelling and transparencies.

Practical exercises (load layers, types of selection, symbology) and assessment.

3 - COORDINATE SYSTEMS, PROJECTIONS AND GEOREFERENCING

Introduction to Coordinate systems and projections.

Defining Coordinate Systems.

Coordinate system transformation. Reprojection of ED50 or ETRS89 Geographic databases.

Image, layer and CAD files georeferencing.

Practical exercises (define, project, image and CAD georeferencing) and assessment.

4 - VECTOR DATA MODEL. EDITING AND CREATING INFORMATION

Creation and editing of spatial data.

- Creating spatial data: Editing tools bar. Digitization techniques.

- Exporting and importing spatial information files from different formats (CAD, DGN, Shp, ASCII, etc.). Create layers from CAD files.

- Modifying existing layers.

- Creating layers from coordinates.

Creation and editing of data in the attribute table

- Structure of an Attribute table.

- Types of data included in an Attribute table.

- Modifying information from an Attribute table.

- Calculate geometric information (Surface, perimeter, length, etc.).

- Creating statistics from an Attribute table.

- Export tables to Excel and other formats. Report and graph creation.

Practical exercises (create layers, digitize, modify attribute tables, add fields, geometric calculations, field calculator) and assessment.

5 - DATA BASE MANAGEMENT

Designing databases.

Joining and relating databases.

Spatial joins. Obtain statistics from database information and spatial position of the elements in a layer.

Practical exercises (join databases and spatial relations) and assessment.

6 - SPATIAL ANALYSIS. MOST COMMON GEOPREOCESSING TOOLS.

Extract (Clip, Split).

Overlay toolset (intersect, union).

Proximity toolsets (buffer analysis, Thiessen polygons).

Multi-criteria analysis. Obtain optimum areas according to several criteria.

Practical exercises (spatial analysis) and assessment.

7 - MAP CREATION

Adjusting the size and type of sheet.

Inserting basic elements: north, scale bar, numeric scale, map legend.

Including other elements: images, graphs and tables.

Adding several data frameworks.

Creation and use of templates.

Printing options.

Creation of a map for a Project.

BLOCK II - FROM ARCGIS TO AUTOCAD

1 - GEODATABASE CREATION
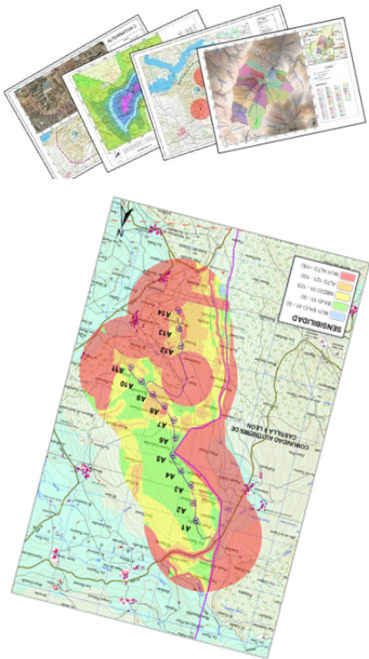
Geodatabase: uses and advantages.

Geodatabase types, creation and management.

2 - EXPORT ARCGIS DATA TO AUTOCAD

Exporting GIS files to CAD (DWG,DGN and DXF) on an advanced level.

Exporting notes or tags from GIS to CAD.

Practical exercise (connect data bases and spatial relations) and assessment.

BLOCK III - AUTOCAD MAP 3D

1 - FUNDAMENTALS AND BASIC USE OF AUTOCAD

User interface.

General concepts. Coordinates, layers, objects and properties.

Creating drawings. Basic drawing tools.

Practical exercise: Designing and elaborating simple drawings.

2 - EDITING OBJECTS, LAYERS AND EXTERNAL REFERENCES

Editing commands in 2D.

Texts and annotations.

Working with layers.

Managing external references.

Practical exercise: Creation and editing of complex drawings.

3 - GEOSPATIAL TOOLS I: FUNDAMENTALS AND VECTOR ELEMENTS

Autocad Map and Geographic Information Systems.

Create maps.

Vector elements.

Data tables.

Practical exercise: Elaboration and composition of 2D maps, and editing vector elements.

4 - GEOSPATIAL TOOLS II: RASTER ELEMENTS AND 3D MANAGEMENT

Raster elements.

Working with Digital Terrain Models.

Applied 3D management.

Practical exercise: Creating 3D maps.

5 - PLANS LAYOUT, PRESENTATION AND DELIVERY

Paper space (layout). Interaction, view option and scale.

General organization, clean layers and display order.

Final presentation. Adding a plot stamp, legend and page setup to plans.

Delivering plans. E-transmit, pdf and plotting.

Practical exercise: Presentation and layout of a complete collection of plans.

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