

QGIS

RASTER QGIS COURSE

Objective

Apply the necessary QGIS tools to consult, validate, analyze and automate processes to generate geographic information from raster data.

Admission profile

- Notions of Geographic Information Systems.
- Notions on QGIS.
- Basic concepts of cartography.
- Skills in managing computer systems.

Graduation profile

The participant:

- Will be able to generate geographic information from raster type information through the basic concepts and characteristics of the application.
- Will use the concepts learned to process a TIFF type image to generate a pixel classification using SCP tools.
- Will use the techniques learned from the transformation to georeferenced images.
- Will use the concepts learned to manipulate raster data to generate aspect, slope, inclination, and contour maps.

Modality

Mixed (live sessions through the Microsoft TEAMS platform and the online SICAP platform of INEGI).

Materials

The materials consist of a user manual in digital format (pdf), worksheets and exercises for each of the topics that conforms the course. These materials will be provided to participants through the SICAP distance training platform of the National Institute of Geography (INEGI)

Methodology

The SICAP distance training platform will be used. This platform has all the topics of the Basic QGIS course, as well as the exercises and worksheets which must be downloaded by the participants to work with the exercises. These practical exercises will be replicated by the instructors in the live sessions with the purpose that the participants perform them alongside the instructors to provide explanations and demonstrations of procedures to be carried out. To practice the procedures, participants will provide evidence through the worksheets that are requested for each topic of the course. These worksheets will be reviewed and given feedback by the assigned instructor. These tasks are mandatory.

The mechanism for raising doubts is through the live session or by email. The grade will be obtained from the result of a final exam. In order to gain access to the final exam the participant must upload all the worksheets on the SICAP platform. It is recommended that the participant, before enrolling in the other QGIS courses offered by INEGI, first enroll in the Basic QGIS. The participant must have 80% attendance as mandatory.

Topics

1. INTRODUCTION

Objective: The participant will learn the basics of raster data.

Subtopics:

1. Raster
2. Use of raster data
3. The advantages of storing data in raster form
4. Raster data sources
5. Cells

2. ADVANCED TOOLS

Objective: The participant will use the editing tools to insert two map views into QGIS. Additionally, will use the QuickMapServers plugin to employ the ESRI Standard service to be used as basemap for the created print composition.

Subtopics:

1. How to insert two map views in QGIS

3. WORKING WITH RASTER DATA

Objective: The participant will learn how to work with multiple raster at the same time, how to use a raster composition to virtually simulate a single raster file, how to convert to another raster format, how to extract contour lines with QGIS, how to generate a shadow map (Hillshade), how to use the QGIS2threejs plugin to create 3D visualizations, and how to create a topographic profile with the Profile Tool. Also will learn how to calculate the slope, which can be used to carry out studies of the capacity of land use for agricultural activity, considering the inclination of the soil related to the types of crops and the planting method, finally will learn how to slice a raster by mask layer.

Subtopics:

1. Generation of information from an MDT
2. Raster composition
3. Creating a virtual raster
4. Convert to another raster format
5. Extraction of contour lines with QGIS
6. Hypsometric map
7. Generation of a Hillshade (shadow map)
8. Showing 3D terrain data
9. Create a topographic profile with Profile Tool
10. Slope calculation.
11. Calculate orientation model.

4. HOW TO USE RASTER CALCULATOR WITH A MASK IN QGIS?

Objective: The participant will learn how to use the raster calculator, which is useful for converting and manipulating data, displaying the results in a new raster layer, how to convert a vector mask to raster format, how to generate contours from a CSV with QGIS, how to extract the Digital Terrain Model from the new point layer using the interpolation tool, and finally, how to perform

contour extraction.

Subtopics:

1. Creation of the mask (vector)
2. Creation of the mask (raster)
3. Operating with the raster calculator
4. How to generate contour lines from a CSV with QGIS?
5. What is spatial interpolation?
6. Triangulated Network Method or TINN
7. Create dimension shapefile from .csv
8. Creation of the MDT using the TIN method
9. Contour extraction

5. GEOREFERENCE

Objective: The participant will learn how to adapt data to the geometry of other more precise data, whose Coordinate System is known, using the QGIS plugin called GDAL Georeferenced.

Subtopics:

1. We begin the task of georeferencing an image.

6. GEOREFERENCED AERIAL IMAGES

Objective: The participant will learn how to georeference images by finding the same location on the reference layer.

Subtopics:

1. Installing the Quick Map Services plugin
2. Accessing the plugin to add basemap
3. Georeferenced dialog box
4. Add point from the Georeferenced toolbar
5. Enter map coordinates from the map canvas
6. Transformation Settings Dialog Settings
7. Start georeferencing
8. Configuration of the Transparency dialog box corresponding to the Custom Transparency Options section

7. RECLASSIFICATION OF A RASTER USING THE RASTER CALCULATOR

Objective: The participant will learn how to perform a raster remapping for establishing a classification.

Subtopics:

1. Convert format
2. Using Notepad++ editor
3. Indicator of space objects
4. Raster Calculator

8. GRASS

Objective: The participant will know how to use the GRASS tool, in the QGIS environment to extract contour lines, create a 3D shadow model, calculate slope and orientation, and create hydrographic basins.

Subtopics:

1. Configuring QGIS to work with GRASS
2. Extraction of contour lines with GRASS
3. Create a 3D shadow model with GRASS
4. Calculation of slope and orientation with GRASS
5. How to create hydrographic basins?

9. SEMIAUTOMATIC CLASSIFICATION PLUGIN (SCP)

Objective: The participant will use the Semi-Automatic Classification Plugin (SCP), to quickly create training areas through the algorithm.

Subtopics:

1. Installation of the Semi-Automatic Classification Plugin
2. Configuring de Semi-Automatic Classification Plugin
3. Supervised Classification
4. Create a training polygon shape
5. ROIS Modification
6. Image classification

10. PUBLICATION OF MAPS ON THE WEB

Objective: The participant will know how to publish maps on the web using qgis2WEB for export the layers with the symbology defined in QGIS.

Subtopics

1. Using QuickMapServices using the XYZ Tiles tool.
2. XYZ Connection Dialog Settings
3. Within the Navigator panel we will use the XYZ Tiles connection
4. Installing the QGIS2web plugin
5. Using the Create web map option of QGIS2web plugin.
6. Export Web Map Dialog Box Settings
7. Displaying information about a selected point
8. Using the measuring tool
9. Showing the map created on the web



Duration 20 hours.

An effective workshop time of 20 hours has been considered. 10 sessions of 2 hours are recommended.

Maximum group capacity

- 25 people.



Schedule:

- Group 1: from 8:30 to 10:30, Mexico time.
- Group 2: from 12:00 to 2:00 p.m., Mexico time.
- September 2 to 13,2024
- Last day for registration March 29,2024.

Technical requirements

To give the workshop, it is necessary that each participant has a computer with internet access and the following minimum characteristic:

RAM memory	8Gb
Processor	Intel i5 processor or equivalent
HDD	20GB free hard drive
Browser	Browser Latest versions of Chrome and Mozilla Firefox
Accessories	Headband with microphone, camera not necessary

Preinstalled software

- QGIS version 3.28.6 LTR
- Notepad++ latest version (free software)
- Microsoft TEAMS



Contact:

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