

“GIS for municipality management” course



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<p>Mailing lists: There are several mailing lists to facilitate the communication with all the people who are interested in gvSIG project, both users and developers. http://www.gvSIG.com/en/community/mailling-lists</p>	
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Certification

To get the certification of the course about “GIS applied to municipality management”, you should complete the following practical exercise, and **pass at least 7 of the 10 activities**.

The **certification** will be **issued by the gvSIG Association**, and will consist of **two certificates**:

- **Course completion certificate**, which includes all the information related to the training content acquired.
- **Official gvSIG User certificate**, having completed the 90 credits necessary, and which allows to obtain the gvSIG Expert certificate, making and passing the credits necessary for it, validating the courses offered by the gvSIG Association.

The **certification** will be **open continuously**, so you can get it when you finish the different modules. There are no specific delivery dates

You must create a text document (LibreOffice, Word ...) in which you must insert the 9 screenshots indicated in the different exercises. Firstly you must insert the activity number (for example, "Activity 1") and then take a screenshot of that activity. They must be ordered correctly.

Note: In activity 8, any screenshot must be taken, but the Layout must be exported to PDF.

You must send the **text document with the 9 screenshots and the PDF file** to gvSIGproject@gmail.com.

Once you receive the approval of having successfully completed the exercise by the tutor, you must make a **payment of € 30**, a minimum cost to cover the expenses related to the evaluation and certification. As a **concept** you should write:

“GIS for municipality management course – [FULL NAME]”

(where “FULL NAME” will be your name and surname)

You will be able to follow any of these ways:

- By **bank transfer**, to this checking account: ES70 0049 5442 25 2416061947 (SWIFT: BSCHESMMXXX)
- By **Paypal or credit card**, through this link:

http://www.gvsig.com/en/courses/gis_for_municipality_management

After making the payment you must reply the tutor sending the **payment receipt** and your **personal data** (name, surname, address and ID card number). You will receive both certificates.

Exercise

First of all you must download the cartography from the following link if you don't have it:

http://downloads.gvsig.org/download/documents/learning/gvsig-courses/GIS_municipality_management_1/GIS_municipality_management_course_Practical_exercise_to_certify.zip

If you have any doubt or problem during the exercise you can use the **users mailing list** as we told you during the course. At this post you have more information about it: <https://blog.gvsig.org/2015/06/17/what-to-do-when-we-get-an-error-in-gvsig/>

After downloading the cartography you have to open gvSIG and then create a new project, adding a new View, which will be in EPSG 26917 (NAD83, UTM Huse 17).

When you create the new View it will be created in the reference system that you had indicated in the gvSIG preferences, so if you had another reference system configured in the preferences, you will have to access to “View -> Properties” menu, and change it to EPSG 26917.

You will also change the name of the new View, and you will rename it with your name and surname.

Now you will maximize the View, and add the layer *Niagara_Falls_neighbourhood_26917.shp* that is provided in this module, which contains the neighbourhoods of Niagara Falls city in Canada.

You will apply a symbology by "Unique values", by the "COMMUNITY" field, selecting a "Colour scheme" with a great variety of colours. Besides, you will apply a red colour to "CROWLAND" community.

Now you are going to apply a basic labelling to the same layer, by the "NEIGHBOUR1" field (not “Neighbour”), with "270" as a fixed heigh, and units in "Meters". You will see the names of the neighbourhoods.

Activity 1

Once you have applied and accepted the symbology and labelling, zoom to the neighbourhood layer on the View, take a screenshot of the whole screen and paste it on the evaluation template.

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Now you are going to add the *Niagara_Falls_parcels_26917.shp* layer that is included in this module, and you are going to open its attribute table.

You are going to add a new field on it with the area of each parcel. For this you can use the tool "Add measure" directly, like we spoke about during the course.

Note: Another option is to use the field calculator, but it is not as straightforward as the "Add measure" tool.

Once you have the “Area” field, you are going to apply a Filter (“Select by attributes” tool), where you will select the parcels with an area of over 20.000 square meters (Query: “AREA>20000”).

Activity 2

Once you have applied the filter, close that window and zoom to an the whole “Parcels” layer, where the parcels with an area of over 20.000 square meters are selected. Take a screenshot of the whole screen and paste it on the evaluation template.

Now you will create a new View, with the EPSG 4326 as Reference System, and you are going to load a new WMS layer with OSM cartography, connecting to the following URL:

<http://ows.terrestris.de/osm/service?>

You will load *OpenStreetMap WMS – by terrestris* layer, in the format that you want, and taking into account that you must select the same CRS than the View (EPSG 4326). You'll see the OpenStreetMap layer on the View.

Now you are going to the website where the geographic information published by government departments and agencies, public bodies and local authorities of United Kingdom is compiled: <https://data.gov.uk/data/search>. At the filters of the left side you are going to select “WMS” in “RESOURCE FORMAT”, and “City of London” in “PUBLISHER” (you have to press “more” to see it).

You will access to the resource that you want and you will copy the URL of the WMS service that you will see in "Data Resources". You will paste it in gvSIG and connect to it. You are going to select the layer that you want (with information that can be seen on the View) and you will select the same reference system than the View (EPSG 4326, that probably will be available to select) - in case it's not available you will select another layer). As format you will select "png" if it is available on the server (or "gif"), which are formats that accept transparency. At that way, if the source is a vector layer, OpenStreetMap layer will be seen in the places where there are no geometries.

If it's a polygon layer and it covers the OpenStreetMap layer, you will activate the new layer, you

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will open "Raster Properties" (secondary button of the mouse) and at "Transparency" tab you will apply enough opacity so that the colours of that layer can be seen, and the layer of OpenStreetMap can be seen below.

Once loaded, you will zoom to the layer (secondary button on that new layer and "Zoom to layer"), and then you will zoom to an area where the loaded data can be seen fine.

Activity 3

Once you have loaded both WMS layers, keeping the zoom where the layers are shown fine, take a screenshot of the whole screen and paste it on the evaluation template.

Below the picture you have to indicate which web service and layer you have selected.

Now you are going to create a new View, in EPSG 4326, and you are going to load a new WMS layer, connecting to:

<http://wms.zh.ch/OrthoZHWMS>

and loading “Orthofoto ZH Sommer RGB” layer (in “png” format and EPSG “4326). Once you have loaded the orthophoto you will zoom in to an area where you see some buildings.

Now you are going to create a new vector layer as we did in the module about “Editing”, in SHP format, which you will call "Buildings". It will be "polygon" type (SURFACE), and you will add a field called "Building" ("String" type; size: 20). In the last window of the wizard you will indicate that this layer is added to the View.

Once added you will start editing on it, and you will digitize several buildings that you have in the orthophoto. You will also fill in the "Building" field that you have created on the table with different values (for example "City Hall", "Sports center"...).

Once you have digitized several polygons and you have filled the table with the values, you will "Finish editing".

Activity 4

Once you have finished editing, showing the View with some of the buildings and the table with the values, take a screenshot of the whole screen and paste it on the evaluation template.

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Now you are going to open the Project Manager (from "Show" menu), and you will select "Table" type of document. You will add the table called “stadium_mapping.csv”, that you have downloaded with the cartography of this module.

Once added it will be opened, and you will see a field with the point number and two fields with the Latitude and Longitude coordinates.

Now you are going to open the last view that you had, which was in the reference system EPSG 4326, and where you had the Zurich Orthofoto in WMS. You are going to add "Event layer" (as we saw in module number 8), selecting the fields X and Y for the coordinates (X=Longitude, Y=Latitude), and EPSG 4326 for Reference system if you have another one in that window.

The table will be loaded at the Table of Contents, but you won't see it in the View because you are in another area. For that you will put the event layer active and you will select "Zoom to layer" tool.

You will see a point layer (which is virtual, because the table registers have been dropped as points, it's not a point shapefile). The coordinates that you have in the table are in EPSG 4326 reference system, that is, the same than the View, so you won't have to reproject it. As you have the orthophoto below you can check that the points correspond to the stadium boundary.

The next step will be to create a new shapefile using derivative geometries tool, as shown at editing module, that is, you are going to create a polygon layer from the point one. The order of the points id indicated in the field called "Point". In this case you will get only one polygon, so when you move the points to the box below in the correct order, firstly you will press "Generate", and once you see the boundary (the polygon) of the stadium you will press "Finish".

Now you will edit the layer that you have created, and you will open its attribute table. You will add a new field (for example from the "Table → Add column" menu). The type will be "String" and size 20, and you will call it "Name". You are going to fill in the only record in the new field with your name. Then you will finish editing.

Now you are going to label the layer by the "Name" field, with a size of 30 pixels. You will see the polygon and a label with your name.

Activity 5

When you have the polygon and the label with your name, take a screenshot of the whole screen and paste it on the evaluation template.

Now you are going to apply a geoprocess on the last polygon that you have created. We want for example to establish a security area for the stadium, and for that we will calculate a buffer by a specific distance, which in this case will be 100 m.

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To do this, on the previous view, with the stadium layer visible, you will open the Toolbox (as you did in the Geoprocessing module), and you will run the "Buffer" geoprocess. You will indicate that it will be 100 meters away, with round border. Since it is only one polygon, you won't mark the option to dissolve entities. As output file you will select "Security_area.shp". Once you run it, you will see the resulting polygon.

Activity 6

When you have the polygon after executing the buffer geoprocess, take a screenshot of the whole screen and insert it in the evaluation template.

At the next exercise you will create a hyperlink as shown during the course, and you will do it by linking to "Niagara_Falls.jpg" image, that is included in this module.

Firstly you will create a folder on your computer and you will rename it with your last name (you can create it in any folder on your disk, but we recommend to use a short path). Then you will copy the "Niagara_Falls.jpg" image in that folder "[your_surname]".

Now you will create a new View, in EPSG 26917 reference system, in which you will add the *Niagara_Falls_neighbourhood_26917.shp* layer that you used at the beginning of this document. Now you will follow the steps indicated in the video to create the hyperlink. Firstly you have to start editing on *Niagara_Falls_neighbourhood_26917.shp* layer, add a new field ("String" type, size "200", which you will call "Link_img". for example You will look for the neighborhood "QUEEN VICTORIA" on the table (you can do it by ordering the "NEIGHBOUR1" field or applying a filter / selecting by attribute), and you will fill that register with the path to "Niagara_Falls.jpg" file on your disk. Then you will finish editing.

Note: Remember that you must take into account if you add the file extension on the table, then you should not include it when you configure the hyperlink. We also recommend you to copy the file path and paste it into the table instead of writing it by hand, because if there is any error in any character the image won't be found.

After editing the table you will access to the layer properties and to the “Hyperlink” tab, where you will configure the hyperlink to the image. You will select the option to link to image files, and you will write the ".jpg" extension there if you haven't included it in the path. If your path ends in "...Niagara_Falls.jpg", in the hyperlink configuration you won't write anything in the extension box, and if your path ends in "....Niagara_Falls" you will have to write ".jpg" in that box. Finally, once you apply and accept, you will move to "QUEEN VICTORIA" neighborhood, and selecting the "Hyperlink" tool, you will click on it. A window with the image of that neighborhood will be opened.

If the image doesn't appear, check that the path is correct, that there is no error in any character.

Activity 7

Once the window is opened with the hyperlink picture, take a screenshot of the whole screen and insert it in the evaluation template.

Now, on the same View, you are going to apply a symbology to the *Niagara_Falls_neighbourhood_26917.shp* layer, by unique values, by the "COMMUNITY" field, selecting a varied colour scheme.

Once you have applied the symbology you will create a Layout, as we spoke about in the course, where you will include that last View. Then you will add a title, in which you will include your name and surname between brackets.

Finally you will also add a legend, a north, a graphic scale and other elements of your choice (an image, a rectangle ...).

Once you have the map with all the elements, you will export it to PDF as explained in the corresponding video.

Activity 8

At this activity you must send the PDF file to the tutor. You don't have to take a screenshot and attach it to the evaluation template.

The next step will be to load the *CAMB3D_D3_CAD.DXF* layer that we used in module number 10, in a new View in EPSG 2249.

Using the Filter (Selecting by attribute) tool you will select the open spaces areas of the city (the registers the “Layer” value of which is "RECREATION_OPENSOURCE_CLIP"), and you will export it to a SHP file, which you can call "Open_space", as we did in that module (remember to mark the option to export only the selected elements).

As it will create line (curve), polygon (surface) and point layers, you will delete the point and line ones from the View because they don't contain any element. You will keep only the “surface” one.

Finally on the table of that Open_space layer, you will select the "Add measure" option in “Table” menu, and add the Open spaces area (selecting “Table → Add measure → Area”).

Now, to know the total area of the open spaces in the city you will activate the name of that new

“Area” field, and you will access to “Table → Statistics” menu (or the corresponding button (Σ) at the toolbar). A new window with the total area will appear.

Activity 9

When you have the new window with the total area of open spaces take a screenshot and attach it to the evaluation template.

Finally you are going to georeference an image. To do this you will create a new View, which you will rename with your name, in EPSG 26918, and you will load *NY_Neighborhood_26918.shp* layer, which is attached in this module. You will apply a "Unique values" legend, by "boro_name" field.

Now you will access the image georeferencing tool that we watch in module 14. You will select the georeferencing option with reference cartography (selecting the view that you have created with your name) and you will select the image to be georeferenced, which will be the "NY_1922.jpg" file that is attached in this module.

You can use the points that you want to georeference the image, but you have to take into account that they don't have to form a straight line.

Once you finish georeferencing and you have the two layers at the View, you will put the georeferenced image above the neighborhood layer (dragging it in the ToC or with secondary button and the option to bring to front). Now you will give approximately 50% transparency to the image, so that you see the colors and boundaries of the neighborhoods below.

Activity 10

When you finish georeferencing and after applying transparency to the image, take a screenshot and attach it to the evaluation template.