00. Introduction to the course
### The course

<table>
<thead>
<tr>
<th>SU2446</th>
<th>COMUNE</th>
<th>SUQ1097658</th>
<th>GEOGRAPHY FOR LOCAL DEVELOPMENT: THEORY AND PRACTICE (C.I.)</th>
<th>ENG</th>
<th>DARIO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><img src="image" alt="Info e programma A.A. 2021/22" /></td>
<td></td>
<td>QUATRIDA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SUQ1097560</td>
<td>GEORGICAL SPACE: CONCEPTS, TOOLS AND PRACTICE (MOD. A)</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><img src="image" alt="Info e programma A.A. 2021/22" /></td>
<td>I Anno</td>
<td>I Anno</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SUQ1097559</td>
<td>GIS: MAPPING AND ANALYSIS (MOD. B)</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><img src="image" alt="Info e programma A.A. 2021/22" /></td>
<td>I Anno</td>
<td>I Anno</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SU2544</th>
<th>COMUNE</th>
<th>SUQ0088421</th>
<th>INTRODUCTION TO GIS: MAPPING AND ANALYSIS</th>
<th>ENG</th>
<th>PIÓVAN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><img src="image" alt="Info e programma A.A. 2021/22" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **GIS: Mapping and Analysis (MOD B.) 9 CFU**
  - Silvia Elena Piovan (5 CFU) (responsible of the module)
  - Michael Edward Hodgson (3 CFU)
  - Daniele Codato (1 CFU)

---

**Ph.D. in 2008. Tenured Researcher in Geography since 2010 (UniPD). Visiting Professor at the University of South Carolina (2015-2019). Director of GIS Laboratory at DiSSGeA.**
- Cartography and GIS
- GIS course for the Doctoral School in Historical Geographical and Anthropological Studies
- Historical Cartography for Geohistorical Reconstructions

**Ph.D. in 1987. Full Professor in Geography since 2006 (USC). Prior to his tenure at the University of South Carolina he was Team Leader at the Oak Ridge National Laboratories and Assistant Professor at the University of Colorado. Visiting Professor at the University of Salzburg University and the University of Padova.**
- Introduction to Drones for Airborne Spatial Data
- Introduction to Geographic Information Systems
- GIS Based Modeling

**Ph.D. in 2014. Fellowschip at the Department of Civil, Environmental And Architectural Engineering. Didactics in Italy and abroad on using opensource GIS (QGIS, Google Earth) for the analysis of ecosystems and biodiversity.**
- Giscience and Digital Earth for Landscape Interpretation

---

![Silvia Elena Piovan, PhD – University of Padova, DiSSGeA]![Students in Landscape Sciences will attend for the first 6 CFU]
Silvia Elena Piovan, PhD

- Department of Historical and Geographic Sciences and the Ancient World (UniPD)

- Phone: +39 049 8274074
- Email: silvia.piovan@unipd.it
- Student Office: on appointment, online
Selected Research Projects

• “Wetlands lost in the Veneto region” (Piovan S.E., Filippini M. & Hodgson M.E.)
  • Historical ecology
  • 2017-present

Selected Research Projects

- PRIN “SYLVA - Rethink the sylvan: Towards a new alliance between biology and artificiality, nature and society, wilderness and humanity” (p.i. Cerreti C., Padova Unit: Piovan S.E.)
  - Geography, Military Geography, Geohistory
  - 2019 - present
Selected Research Projects

• Project “Cultural value and risk associated with dams for mills in South Carolina (USA)” (Hodgson M.E., Piovan S.E., Maurina L.)
  • Geohistory, Ecosystem Services
  • 2018 - present

Selected Research Projects

• “The mobility of coal and people in the Harlan County (Kentucky): the case study of Lynch" (p.i. Silvia E. Piovan)
  • Geohistory, Local Development
  • 2019 - present
Learning Objectives

• **Target Skills and Knowledge**
  - To know the fundamental concepts of cartography and of Geographic Information System (GIS), especially for their use in the geohistorical analysis of the territory and landscape.
  - To know how to manage a GIS project in all its main phases.
  - To be able to apply the theoretical approaches to geographic space and the conceptual and practical tools studied in a real case study (workshop).
• FIRST PART (elements of theoretical cartography and mapping techniques)
  - Definitions, purposes of the maps, the power of maps
  - Shape of the Earth, datums, projections, coordinate systems, scale, conventional signs and symbols and practice on maps.

• SECOND PART (theoretical part of GIS)
  - Introduction to GIS (definitions, importance in territorial studies)
  - Elements of Digital Earth
  - Construction phases of a GIS project
  - Data models (raster and vector)
  - Structure and basics of QGIS and ArcGIS

• THIRD PART (practical activities)
  - Add / import existing data, web-based maps services
  - Introduction to GIS
  - Digitize new features
  - Creation of a map using the software and use of symbology
  - Selection and queries
  - Geo-referencing (historical maps, vertical photos, ...)
  - Geo-processing operations and analysis (network, viewshed, multicriteria analysis)
  - Introduction to the “Story map”

REAL APPLICATIONS OF CARTOGRAPHY AND GIS IN TERRITORIAL STUDIES AND RESEARCH
Didactical Methods

• Theoretical Lectures
• GIS laboratory online
• GIS projects and mapping
• Seminars
• Studying reference literature

Students (also non-attending) should install the open source software QGIS in their computer to practice the practical GIS part of the course.

You will have also the possibility to install an ArcGIS (ESRI) license (valid for 1 year), if interested
Examination Methods (MOD. B)

• Attending students:

1. Reports (about 1000 words text and a GIS cartographic elaboration) (50%) to deliver at the end of each GIS project treated during the lesson (the instructor will advise each time for the report delivery deadline). The text should include: theoretical and geographic context, GIS method used (data, processes,…), results, comments. During the module 5-7 GIS projects will be discussed.

2. Final oral exam during ordinary exam sessions (50%). The questions will cover all the bibliographic material assigned in the study and will include: 1 question about the use of coordinate systems, 3 questions on the other main topics treated during the module and 1 question about the projects.

The final grade of the module will be calculated on the average of each evaluation (points 1 and 2).

THE FINAL GRADE OF THE INTEGRATED COURSE WILL BE THE WEIGHTED AVERAGE AMONG THE GRADES OBTAINED IN THE 2 MODULES (i.e. Modules A, Prof. Quatrida and B, Prof. Piovan).
Examination Methods (MOD. B)

• Non-attending students:

1. Final oral exam during ordinary exam sessions that will include:
   1) The discussion of reports (1000 words each and GIS cartographic productions) (50%) on the different GIS projects treated during the module, sent to the teacher at least one week before the oral exam. The text should include: theoretical and geographic context, GIS method, results, comments. During the module 5-7 GIS projects will be discussed.

2. Oral questions (50%) concerning all the bibliographic material assigned through Moodle during the module (1 question about the theory behind the use of coordinate systems and 4 in-depth questions on the main topics).

The final grade for the module will be the average of all assessments (points 1-2).

THE FINAL GRADE OF THE INTEGRATED COURSE WILL BE THE WEIGHTED AVERAGE AMONG THE GRADES OBTAINED IN THE 2 MODULES (i.e. Modules A, Prof. Quatrida and B, Prof. Piovan).
Readings

• Materials distributed on Moodle (pdf of lessons, scientific articles)


• THE BOOK CHAPTERS ARE NOT MANDATORY TO PASS THE EXAM, BUT CAN HELP IN THE STUDY
How to install QGIS

- Search for "QGIS" on Google and click on the first link (www.qgis.org)
How to install QGIS

- In the QGIS Website main page, select the "English" language in the upper-right menu.
- Click on the green button "Download now" ("Scarica adesso").
How to install QGIS

Windows users

• Download the version 3.16 clicking on the link "QGIS Standalone Installer Version 3.16" - it is the long term release repository (most stable).
How to install QGIS

Windows users

• Save the .msi file in the most convenient folder on your PC and launch it when the download finished.
How to install QGIS

Mac users

• Download the **version 3.16** clicking on the link "QGIS Standalone Installer Version 3.10 (64 bit)" - it is the long term release repository (most stable).

Maybe (for the older MacOS), after you download the “installer”, find the file, and try to install. You may see a prompt (with link) to install Python libraries. Click on the link.
How to install QGIS

Mac users

On the Python download page, under macOS, find the latest version of Python and click on Download
How to install QGIS

Mac users

Scroll down to bottom of the page and select the version for your operating system
How to install QGIS

Mac users

Double-click on the download installer and follow the instructions
How to install QGIS

Mac users

Now install the QGIS pkg