MASTER GEOMATICS

GEOGRAPHIC INFORMATION: SPATIAL ANALYSIS AND REMOTE SENSING (GISARS)

ENTRY REQUIREMENTS

Acceptance on the course is by application. Admission to M1 is possible with a General Bachelor's degree. Admission to M2 is possible after a high school diploma + 4 years of higher education or the equivalent (Science Master's 1 or 2, 2 years of engineering school). The degree course is available as continuing training.

ACQUIRED SKILLS

The Master's degree is designed to enable students to: design a method for collecting and analysing geographic information which is tailored to a problem being addressed, based on best current practice and using the most common software (geographic information systems and spatial image processing software); develop automatic processes in a Geographic Information System or a piece of image processing software.

YOUR FUTURE CAREER

This Master's degree is both vocationally and research-oriented and is designed to enable graduates to find employment as design engineers, research engineers, project leaders in companies (digital geography companies, geomatics, geophysical surveying, environment, defence, design offices or regional governments). It also leads on to a PhD with subsequent job opportunities in higher education or research in public or semi-public bodies, such as: CNRS, IGN, IPG, IRD, IRSTEA, INRA and INRIA, or abroad.

BENEFITS OF THE PROGRAM

This pathway takes into account the needs identified in the field of geomatics, thanks in particular to a "Professions and Skills" survey conducted in 2013 by the French Association for Geographic Information, the GeoRezo network and the MAGIS CNRS Research Group in geomatics. Students are therefore perfectly prepared for this professional field.

Pour candidater : HTTPS://CANDIDATURES.U-PEM.FR/
For further details :

Information, Career guidance and Professional integration Department
(SIO-IP) : sio@u-pem.fr / +33 1 60 95 76 76
www.u-pem.fr/formations/785
YEAR 1, SEMESTER 1.

Modelling and handling vector-based geographic information (ECTS : 3) - Theory of GIS, data acquisition, cartography and vector data modelling. Vector data processing with QGIS and POSTGIS. This course is a basis for other courses dealing with vector geographic data.

Geometric analysis of vector-based geographic data (ECTS : 3) - Introduction to classical tools (operators, indices, auxiliary structures like graphs or triangulation) to extract implicit information from vector geographic data and DTMs. Design and implementation of a methodology based on these tools to answer a given question.

Statistical analysis of spatial data, and representation (ECTS : 3) - Statistical methods and tools applied to geographic information. Undertake a scientific approach adapted to diverse issues and geographic data: statistical description of data, proposition of indicators and classification methods, representation of statistical data.

Analysis of spatial-temporal dynamics (ECTS : 3) - Analysis of diverse dynamic phenomena: territory evolution and individual movements. Integration of heterogeneous data: multi-sources data describing the territory at multi-dates, raster and vector types and mobility data. Application to diverse themes:

Supervised project on spatial analysis (ECTS : 3) - Supervised projects done in small groups proposed by researchers from a research laboratory or by students themselves. They are focused on issues of spatial analysis. The projects enable to acquire autonomy concerning modelling and spatial analysis, to develop the students' initiative.

Remote sensing - Basic fundamentals (ECTS : 3) - Introduction to the fundamentals in physics to tackle the characteristics and the required processing of the different remote sensing data for their applications. In particular, the solar and terrestrial radiations, as well as optical and radar remote sensing.

Image processing (ECTS : 3) - The objective of this course is to familiarize students with the images in terms of computer representation, visualization, basic statistics, global and local radiometric processing, geometry processing. Supervised works allow students to use the ENV.

Remote sensing - Applications (ECTS : 3) - Panorama of various remote sensing applications (Lidar, radar interferometry, radar polarimetry, hyperspectral remote sensing, drones, orbitography, precise georeferencement, geomorphology, surface motions interpretation, ...).

Mathematics for Geographical Sciences (ECTS : 3) - The objective is to refresh the fundamental scientific knowledge useful for other courses. Covered include vector calculus, 2D and 3D geometry, probability and statistics, .... Some of the concepts presented will be illustrated in sessions on a scientific topic.

Introduction to scientific monitoring (ECTS : 3) - The aim is to open the field of scientific and technical knowledge related to the master through oral presentations of French or English speakers. The students will restore orally the knowledge gained from these conferences and lectures during the internship.

Supervised project on remote sensing (ECTS : 3) - The objective is to go into a topic on remote sensing in details. The topics are chosen by the students under the supervision of the instructor. They can be oriented on a specific thematic application by analyzing the contribution of different sensors, or not.

YEAR 2, SEMESTER 2.

Internship (ECTS : 24)

YEAR 2, SEMESTER 3.

STUDY PROGRAM