GIS applied to Water Management – 3 ECTS

Context

Geographical Information Systems (GIS) are software commonly used to address the water issues on a wide range of topics (watershed management, groundwater contamination, flood control, *etc.*). GIS constitute a focal tool which aggregates data from different sources and scales. In this module, students will be initiated to the QGIS software and to common GIS files (vector, raster and table). Basic skills will be taught (data handling, mapping) and a specific focus will be done on the use of hydrological datasets.

Learning outcomes

- Work in multicultural teams
- Describe the different GIS data (vector, raster and standalone table)
- Design cartographic outputs
- Handle basic analysis Tools (selection, buffer, clip, intersection)
- Create hydrological dataset from elevation dataset (catchment delineation, stream network, upland area)
- Search and download on-line free dataset
- Design and use workflows of GIS data processing

Audience & prerequisites

- Students attenting BSC or MSc programs in Life, Earth, Environmental and Agro- Sciences.
- This module is designed for students who are newcomers to GIS, consequently, no specific prerequisites in GIS are required. Students should be fluent with basic computer skills (Excel, management of files and folders).
- Requirements of English language level:
    - 785 TOEIC points or higher
    - 534 TOEFL ITP points or higher / 227 TOEFL CBT / 72 TOEFL iBT points
    - 5.5 IELTS points or higher
- Number of attendees: from 10 to 20.

Organization

- The medium of instruction and evaluation is English
- The practical classes will be run on-line and real-time using the MS Teams platform. UniLaSalle uses an online platform dedicated to GIS training. An example of class handout can be checked out on this link (*please use Firefox, Chrome or Safari*).
- Software: QGIS (open source software that can be installed on Windows, Mac and Linux operating systems).

Evaluation

Attendance to all classes is required to be able to validate the course.

The course evaluation will be based on individual exam [70%] + group project on a case study of water management [30%].

A certificate of attendance will be delivered by the end of the course.

Schedule

- May-June 2021
- 5 successive weeks
- Recurrent days of class: Tuesday, Wednesday and Thursday

Program

Schedule (UTC+2)	Type	Duration	Objectives
May 18 – 4 :00 PM	Lecture	1.5 h	Presentation of the participants Introduction and GIS key concepts
May 18 – 5 :30 PM	Practical works #01	1.5h	Cartography of the diffuse contaminants
May 19 – 4 :00 PM	Practical works #02	3h	Aquifer vulnerability to vertical contamination
May 20 – 4 :00 PM	Practical works #03	3h	Introduction to Open dataset (Open Topography) Basic DEM processing
May 25 – 4 :00 PM	Practical works #04	3h	Catchment and stream network delineation from DEM datasets
May 26 – 4 :00 PM	Practical works #05	3h	Forecasting and mapping water availability
May 27 – 4 :00 PM	Practical works #06	3h	Forecasting and mapping water availability
June 1 – 4 :00 PM	Practical works #07	3h	Design of data processing workflow
June 2 – 4 :00 PM	Practical works #08	3h	Overview, training to individual exam
June 3 – 4 :00 PM	Individual exam (on computer)	2h	
June 8 - 4 :00 PM	Group project supervision	3h	Instructor available to guide students in their group project
June 10 - 4 :00 PM	Group project supervision	3h	Instructor available to guide students in their group project
June 17 - 4 :00 PM	Group project supervision	3h	Instructor available to guide students in their group project
	Total	**35h**	

Individual working time (beside classes) is estimated 20h.

Academic Contact

Course leader and instructor: Romain ARMAND, Associate Professor in GIS and surface hydrology.
Email address: romain.armand@unilasalle.fr

Application contact:

Applications must only be sent to the following email address **incoming@unilasalle.fr**

Deadline to apply: April 16th 2021

The application must include:

- a CV
- a certificate of English language level
- the transcripts of academic records from the past 3 years
- the application form duly filled in