

Syllabus Module 233

Module ≠ 233	Module 233 “Geographic Information System and Environmental Health”
UE coordinator	Mauricio FUENTES, University Paris 8 (France), fuentesv.mauricio@gmail.com Bertrand LEFEBVRE, Institut Français de Pondichéry, bertrand.lefebvre@ifpindia.org
Dates	Week 45: 7 November to 10 November 2022
ECTS	3
Duration	Number of days: 4
Location	EHESP 20 Avenue George Sand 93210 LA PLAINE ST DENIS
Description	<p>Geographic Information Systems (GIS) have been absolutely fundamental in revealing patterns of inequalities in environmental exposures and mapping them. Many advances (GPS, remote sensing, open geographic data...) that have occurred in the past 20 years have helped us to better understand the spatial and temporal dimensions of exposures that are either harmful or beneficial for people's health.</p> <p>Students will learn how to apply GIS principles and tools to create maps and conduct basic spatial analysis investigations in environmental health. Using GoogleMaps, QGIS and a range of online geographic and environmental databases, students will learn how to create and manage spatial information. The module will introduce the best practices regarding cartographic principles and manipulation of vector and raster layers to create powerful maps and visualizations. Students will learn how to interpret and communicate results based on maps. Finally, basic spatial analysis tools (buffers, heat map, density measure) will be introduced to the audience. While course's materials will be based on environmental health cases (i.e. planetary health), the methods and tools covered can be applied to other areas (i.e. health services research).</p> <p>This module, while being open to any student, is a required introduction to the module 231 on Spatial Statistical Analysis (ISB Track).</p>
Prerequisites	Advanced Core modules in environmental and occupational health sciences, in information sciences and biostatistics, in social & behavioral sciences in public health and in management & policy sciences
Course learning objectives	At the end of the module, the students should be able to: 1-Perform surveillance of risks and threats to the full continuum of factors that influence and determine health in order to identify intervention needs 2- Interpretate of epidemiologic and other research findings related to environmental risks, and the ability to participate in designing and conducting research
Structure (details of session)	<p>Monday, Nov 7</p> <ol style="list-style-type: none"> 1. What are spatial data and GIS? Key principles 2. Field survey: How to use your smartphone to collect and create spatial information? 3. Designing and sharing maps with online tools (GoogleMaps,...) <p>Tuesday, Nov 8</p> <ol style="list-style-type: none"> 4. Introduction to QGIS: user interface, data management, creating spatial information, requests and selections tools <p>Wednesday, Nov 9</p> <ol style="list-style-type: none"> 5. Mapping with QGIS: Symbology, cartography, exporting maps, interpreting maps <p>Thursday, Nov 10</p> <ol style="list-style-type: none"> 6. Basic spatial analysis tools: buffers, distance and density measures 7. Homework Assignment
Resources	Students will be provided with textbooks and papers for each session described below
Course requirement	<p>Students are expected to attend all lectures and group works. Students will be required to arrive to each class well prepared by reading materials provided on REAL, online course EHESP platform. Beyond 4:00 pm, attendance to group works is not required but permitted for preparing the group work assignment.</p> <p>Students need to bring their own laptop and smartphone. QGIS is a free and open source Geographic Information System that can be installed on any operating system. We will use the latest LTR version. A Google account is necessary to use GoogleMaps tools.</p>
Grading and assessment	100% homework assignment (mini-atlas project) to be submitted by December 31 st 2022 (individual homework).

Course policy	<p>Attendance & punctuality Regular and punctual class attendance is a prerequisite for receiving credit in a course. Students are expected to attend each class. Attendance will be taken at each class. The obligations of attendance and punctuality cover every aspect of the course: - lectures, conferences, group projects, assessments, examinations, as described in EHESP Academic Regulations http://mph.ehesp.fr EHESP Academic Regulation Article. 3). If students are not able to make it to class, they are required to send an email to the instructor and to the MPH program coordinating team explaining their absence prior to the scheduled class date. All supporting documents are provided to the end-of-year panel.</p> <p>Students who miss class are responsible for content. Any student who misses a class has the responsibility for obtaining copies of notes, handouts and assignments. If additional assistance is still necessary, an appointment should be scheduled with the instructor. Class time is not to be used to go over material with students who have missed class.</p> <p>Lateness: Students who are more than 10 minutes late may be denied access to a class. Repeated late arrivals may be counted as absences (See http://mph.ehesp.fr EHESP Academic Regulation Article. 3 Attendance & Punctuality)</p> <p>Maximum absences authorized & penalty otherwise Above 20% of absences will be designated a fail for a given class. The students will be entitled to be reassessed in any failed component(s). If they undertake a reassessment or they retake a module this means that they cannot normally obtain more than the minimum pass mark (i.e. 10 out of 20)</p> <p>Exceptional circumstances Absence from any examination or test, or late submission of assignments due to illness, psychological problems, or exceptional personal reasons must be justified; otherwise, students will be penalized, as above mentioned. Students must directly notify their professor or the MPH academic secretariat before the exam or before the assignment deadline. Before accepting the student's justification, the professor or the MPH academic secretariat has the right to request either a certificate from the attending physician or from a psychologist, or from any other relevant person (See http://mph.ehesp.fr EHESP Academic Regulation Article 4 Examinations).</p> <p>Courtesy: <u>All cell phones/pages MUST be turned off during class time.</u> Students are required to conduct themselves according to professional standards, eating during class time is not permitted during class time, such as course or group work.</p>
Valuing diversity	<p>Diversity enriches learning. It requires an atmosphere of inclusion and tolerance, which oftentimes challenges our own closely-held ideas, as well as our personal comfort zones. The results, however, create a sense of community and promote excellence in the learning environment. This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity. Diversity includes consideration of: (1) life experiences, including type, variety, uniqueness, duration, personal values, political viewpoints, and intensity; and (2) factors related to "diversity of presence," including, among others, age, economic circumstances, ethnic identification, family educational attainment, disability, gender, geographic origin, maturity, race, religion, sexual orientation and social position.</p>
Course evaluation	<p>EHESP requests that you complete a course evaluation at the end of the school year. Your responses will be anonymous, with feedback provided in the aggregate. Open-ended comments will be shared with instructors, but not identified with individual students. Your participation in course evaluation is an expectation, since providing constructive feedback is a professional obligation. Feedback is critical, moreover, to improving the quality of our courses, as well as for instructor assessment.</p>

Sessions 1-3	Module 233 "Geographic Information System and Environmental Health"
Session Title	An introduction to spatial data and GIS
Lecturer	Samuel BENKIMOUN, PhD candidate, CNRS UMR 8504, Géographie-cités, Paris, France Mauricio FUENTES, Researcher, University Paris 8 (France), fuentesv.mauricio@gmail.com Bertrand LEFEBVRE, Researcher, Institut Français de Pondichéry, Pondicherry (India), bertrand.lefebvre@ifpindia.org
Session outline	<ul style="list-style-type: none"> - An introduction to spatial data and GIS - Field survey: How to use your smartphone to collect and create spatial information? - Designing and sharing maps with GoogleMaps - Exploring online geospatial resources for environmental health research
Learning Objectives	<ul style="list-style-type: none"> - To understand the specificities of spatial data

	- To search and create spatial data with online tools
Reading	Cromley, E., McLafferty S. (2011) <i>GIS and Public Health</i> , Guilford Press
Duration	6 hours
Dates	Monday November 7 th 2022, 9.00 a.m.-12.00 a.m. & 1:00 pm to 4:00 pm
Training methods	Short Lectures and Lab Active participation of the students
Validation	None (at the end of the Module)

Sessions 4-7	Module 233 “Geographic Information System and Environmental Health”
Session Title	Mapping and basics spatial analysis tools with QGIS
Lecturer	Samuel BENKIMOUN, PhD candidate, CNRS UMR 8504, Geographie-cités, Paris, France Mauricio FUENTES, Researcher, University Paris 8 (France), fuentesv.mauricio@gmail.com Bertrand LEFEBVRE, Researcher, Institut Français de Pondichéry, Pondicherry (India) bertrand.lefebvre@ifpindia.org
Session outline	<ul style="list-style-type: none"> - Managing and creating spatial information with QGIS: projection system, creating spatial objects, from raster to vector objects, selection/request tools, attribute table management - Designing and interpreting maps with QGIS: graphic semiology and symbologie rules, maps design, exporting and sharing maps, interpreting results - Basic spatial analysis tools (spatial joint, distance measures, kriging and kernel density) with QGIS
Learning Objectives	<ul style="list-style-type: none"> - Create and manage spatial information with QGIS - Create maps, use basic spatial analysis tools and interpret results - Analyze certain bias related to spatial information (ecological fallacy, MAUP)
Reading	Cromley, E., McLafferty S. (2011) <i>GIS and Public Health</i> , Guilford Press
Duration	18 hours
Dates	Tuesday November 8 th 2022, 9.00 a.m.-12.00 a.m. & 1:00 pm to 4:00 pm Wednesday November 9 th 2022, 9.00 a.m.-12.00 a.m. & 1:00 pm to 4:00 pm Thursday November 10 th 2022, 9.00 a.m.-12.00 a.m. & 1:00 pm to 4:00 pm
Training methods	Short Lecture, Lab and Group Work Active participation of the students
Validation	Homework will account for 100% of the module grade.