Geo-Spatial and web technologies

Lecturer
Mahmoud SAKR (Coordinator)

Course mnemonic
INFO-H509

ECTS credits
5 credits

Language(s) of instruction
English

Course period
Second term

Campus
Solbosch

Course content

The topics covered in this course
- Introduction to Geographical Information Systems GIS
- Selected GIS algorithms
- Introduction to temporal databases
- Introduction to spatiotemporal data
- Selected spatiotemporal algorithms
- Spatiotemporal pattern queries
- Map matching
- Spatial and spatiotemporal index structures
- Standards and file formats for geospatial data
- Hands on practical sessions on GIS and mobility data processing and web visualization

Objectives (and/or specific learning outcomes)

This course provides the basic mathematical and computer science theory of geospatial and mobility data science. You get the basic theory of storing geographic data in databases and for representing its temporal evolution in the form of movement. The course illustrates a selection of the most important algorithms in GIS and mobility. On the practical side, you will learn tools for spatial and spatiotemporal analysis. Through the course project will integrate the studied methods into a real end-to-end mobility data science problem.

Pre-requisits and co-requisits

Courses having this one as co-requisit

INFO-F439 | Advanced Methods in Bioinformatics | 5 crédits, INFO-H419 | Data warehouses | 5 crédits and INFO-Y099 | Multicore programming | 6 crédits

Teaching method and learning activities

Cocktail of ex-cathedra lectures, demonstrations, practical machine exercises, and personal project work.

Contribution to the teaching profile

This teaching unit contributes to the following competences:
- Have in-depth knowledge and understanding of geographical data, both transversal and specialised. Be capable of autonomously and critically following current trends and advances in this body of knowledge.
- Be capable of formulating and solving complex or open-ended technical and scientific problems by using abstraction, modeling, simulation, and multi-disciplinary analysis while satisfying the requirements of university-level research and responding to requirements, constraints, the set context and the technical, socio-economical ethical and environmental stakes—all with the purpose of obtaining concrete solutions.
- Make decisions and develop leadership, in a variety of professional contexts, disciplines, and cultures.
- Communicate and share information in a structured manner: orally, graphically and written, in French and in one or more other languages. Communicate on scientific, technical and cultural aspects, adapting him/herself to the desired goal as well as the target audience.

References, bibliography and recommended reading

- Course notes, and readings that will be suggested during lectures

Course notes

Université virtuelle

Other information

Place(s) of teaching

Solbosch

Contact(s)

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Evaluation method(s)

written examination and Project

Determination of the mark (including the weighting of partial marks)

- Group project 40%

- Written exam 60%

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the Brussels School of Engineering

MA-IRCB | Master of science in Biomedical Engineering | finalité Professional/unit 2 and MA-IRIF | Master of science in Computer Science and Engineering | finalité Professional/unit 1 and finalité Professional/unit 2

Programmes proposing this course at the faculty of Sciences

MA-INFO | Master in Computer science | finalité Professional/unit 2