UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Smart Mobility

2425-2-FDS01Q038-FDS01Q038M

Aims

Gain knowledge related to typical mobility issues in highly urbanized environments and tools for processing mobility data.

Contents

- Towards the data-driven city
- Smart Mobility: Technology Enablers and Disruptors
- Mobility as a Service
- Mobility analytics with GeoPandas

Detailed program

Towards the data-driven city
Challenges, main elements, the augmented city

Smart Mobility - Foundational Technologies
Introduction to smart mobility - the technological aspects of smart mobility - foundational technologies

Smart Mobility - Technology Enablers
The technological aspects of smart mobility - Technology Enablers

Smart Mobility - Disruptors / Mobility as a Service
The technological aspects of smart mobility - Disruptors - Mobility as a Service model

Lab session 1: Introduction to GeoPandas

Lab session 2: Spatial relationships and operations with GeoPandas and Shapely

Lab session 3: OpenStreetMap and Street Network Analysis

Lab session 4: Mobility Analytics

Prerequisites

Basic knowledge of the Python language, virtual environments and Jupyter

Teaching form

12 hours conducted in in-person delivery mode
12 hours of laboratory conduted in interactive delivery mode

Textbook and teaching resource

Slides and notes provided by lecturers

Semester

Second semester

Assessment method

The course will be evaluated through an essay and an oral presentation on a self-selected smart city topic. Students, in groups of two, will write an essay in English (or Italian), covering problem description, data analytics, visualization, and policy recommendations. The essay should address relevant indicators, data selection, cleaning, spatial and temporal analysis, and prediction or classification models if needed. Ethical and social implications should also be considered. An oral presentation of the essay is required. Evaluation criteria include clarity and coherence of problem description, quality and relevance of data, accuracy and validity of analysis and visualization, robustness and reliability of models, effectiveness of policy suggestions, consideration of ethical and social implications, overall essay quality, quality of the in-person presentation.

Office hours

Received by appointment to be arranged by e-mail

Sustainable Development Goals