UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Data Science Lab On Smart Cities

2324-2-FDS01Q029

Aims

The aim of this course is to provide students with a comprehensive understanding of smart cities and smart mobility. It explores the theoretical framework, key concepts, actors, processes, and outcomes associated with smart cities. Additionally, the course delves into the role of data analysts in the context of smart cities and examines the challenges and advancements in smart mobility. By the end of the course, students should have a solid foundation in the theories and practices related to smart cities and smart mobility.

Contents

1. Theoretical framework on the smart city

- Dimensions, definitions, and measurement of smart cities
- Actors, processes, and outcomes of smart cities
- Role of data analysts in smart cities

2. Smart Mobility

- Data-driven cities and the augmented city
- Smart city reference architectures
- Use cases and best practices in smart mobility
- GeoPandas and spatial analysis for smart mobility

Detailed program

1: Presentation of the course and preliminary definitions

- Course overview and structure
- Introduction to the concept of smart cities

2: Street level bureaucrats and data analysts in the smart city

- Role of street level bureaucrats in smart city development
- Importance of data analysts in analyzing and utilizing smart city data

3: Smart city and platform city

- Comparison of smart cities and platform cities
- Examination of actors, indicators, policies, and outcomes in both types of cities

4: Smart city and urban governance

- Modes of regulation in smart cities
- Citizen participation and social capital in smart city governance

5: The smart 15 minutes city

- Introduction to the 15 minutes city concept and its objectives
- Analysis of how smart technologies contribute to the 15 minutes city and its impact on income inequality

6: How to construct a good case-study

- Working with data on short-term tourism and Airbnb's effects on housing markets
- Case study construction techniques and methodologies

7: Working with data: Smart city and inequalities

- Examination of the relationship between smart cities, urban inequality, and gender equality

8: Introduction to GeoPandas

- Practical sessions with exercises on using GeoPandas for spatial analysis in smart mobility

Prerequisites

- Familiarity with concepts related to data analysis and interpretation
- Understanding of urban governance and policy-making processes would be beneficial
- Basic programming skills, particularly in Python, would be helpful for the GeoPandas lab

Teaching form

Lectures, analysis of scientific articles, laboratory

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

SUSTAINABLE CITIES AND COMMUNITIES