



## Teaching Guide

Identifying Data					2022/23
Subject (*)	Cities Technological Challenges		Code	630541004	
Study programme	Máster Universitario en Desafíos das Cidades				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	1st four-month period	First	Obligatory	5	
Language	SpanishGalicianPortuguese				
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría de Computadores				
Coordinador	López Taboada, Guillermo	E-mail	guillermo.lopez.taboada@udc.es		
Lecturers	López Taboada, Guillermo	E-mail	guillermo.lopez.taboada@udc.es		
Web	campusvirtual.udc.gal				
General description	<p>This subject introduces students to the systematic analysis of urban data in its institutional context, with a special focus on the smart cities movement. It seeks to provide a foundation in systematic approaches to collecting, analysing, modeling and interpreting quantitative and qualitative data used to inform sound research applicable to urban planning and management and policy making.</p> <p>In addition to the thematic science of urban data and its analysis, theory and critical analysis of topics such as IoT, Big Data, Cloud, Business Analytics, Social Media Mining and its role in the planning and management of the cities of the future, and the role that technology, data and urban analytics can play in transforming cities, integrating emerging challenges such as data ownership, privacy and ethics.</p> <p>It also seeks to present and critically analyze the range of existing and necessary indicators for the measurement of sustainability, quality of life and urban intelligence and the presentation of new metrics for the measurement of urban intelligence, for the control of urban systems and for monitoring the urban environment.</p>				

## Study programme competences

Code	Study programme competences
A7	CE4.1 - Understand the ongoing digital transformation processes, becoming familiar with analytical and urban modeling tools to apply them in decision-making processes (reactive and preventive) in urban planning and management, based on analytical information.
A8	CE4.2 - Plan and recommend intelligent information gathering systems in order to monitor sustainability, quality of life and urban intelligence.
B2	CB7 - That students know how to apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
B3	CB8 - That students are able to integrate knowledge and face the complexity of making judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.
B5	CB10 - That students possess the learning skills that will enable them to continue studying in a manner that will be largely self-directed or autonomous.
B8	CG3 - To acquire high-level knowledge, tools and resources to meet the research and professional expectations of students and society in the study of urban development, planning and management.
C2	CT2 - Use the basic tools of information and communication technologies (ICT) necessary for the exercise of their profession and for lifelong learning.
C5	CT5 - Value the importance of research, innovation and technological development in the socioeconomic and cultural advancement of society.

## Learning outcomes



Learning outcomes	Study programme competences		
Prepare professionals capable of participating in the construction of cities analytics, through the development of innovative solutions for the collection, processing and analysis of city data that promote greater sustainability in its management and governance in parallel with a more active and participatory citizenship.	AC7 AC8	BC2 BC3 BC5 BC8	CC2 CC5

Contents	
Topic	Sub-topic
1. Introduction to Smart Cities	Smart cities: context, challenges and opportunities.
2. Introduction to Sensorization	Sensorization: context, challenges and opportunities.
3. Exploring data and processing systems for urban environments	Exploratory data analysis. Systems for data processing in the urban environment.
4. Data processing and analysis for decision making	Data processing and business intelligence.
5. Applications and examples	Representative applications and smart city projects.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Laboratory practice	A7 A8 B8 B2 B3 B5 C2	15	51	66
Workbook	A7 B8 B5 C5	0	29	29
Supervised projects	A8 B8 B2 B3 B5 C2 C5	0	15	15
Seminar	A7 B8 B5 C5	10	0	10
Personalized attention		5	0	5

(\*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	Description
Laboratory practice	Carrying out practical activities, such as demonstrations, exercises, experiments and research.
Workbook	Reading of didactic material, viewing of videos and consultation of multimedia material.
Supervised projects	Carrying out work after searching and managing information, writing texts and preparing documents.
Seminar	Intensive study of a topic in a small group with discussion, participation, preparation of documents and conclusions that must be reached by all components of the seminar.

Personalized attention	
Methodologies	Description
Supervised projects	During the laboratory practices, supervised works, and seminars, the students will be able to present questions, doubts, etc.
Seminar	The teacher, responding to her requests, will review concepts, solve new problems or use any activity that he considers appropriate to resolve the issues raised.
Laboratory practice	

Assessment			
Methodologies	Competencies	Description	Qualification
Supervised projects	A8 B8 B2 B3 B5 C2 C5	Continuous monitoring of student activity on a proposed topic. In case of impossibility of follow-up, the work will be evaluated by means of the final exam.	15
Seminar	A7 B8 B5 C5	Continuous monitoring of student participation in the seminar. In case of impossibility of follow-up, the work will be evaluated by means of the final exam.	15



Laboratory practice	A7 A8 B8 B2 B3 B5 C2	Completion of the proposed practices.	70
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#### Assessment comments

In order to pass the subject, it is a mandatory condition to present contributions in the three methodologies and that the final weighting of the three is equal to or greater than a 5 out of 10.

On the second opportunity, the same laboratory practices will be presented and, as it is not possible to continue monitoring the student, 30% of the grade will correspond to the final exam.

#### Sources of information

<b>Basic</b>	- Anders Lisdorf (2019). Demystifying Smart Cities: practical perspectives on how cities can leverage the potential of new technologies. Apress / Springer
<b>Complementary</b>	- Y. Karimi, M.H. Kashani, M. Akbari, E. Mahdipour (2021). Leveraging big data in smart cities: A systematic review (in Journal Concurrency and Computation: Practice and Experience). Wiley

#### Recommendations

##### Subjects that it is recommended to have taken before

##### Subjects that are recommended to be taken simultaneously

##### Subjects that continue the syllabus

IoT and Ambient Intelligence Technologies for Building Smart Cities/630541013

Information Systems for Smart Cities/630541014

##### Other comments

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.