

A PARTNERSHIP BETWEEN



# RESICITIES RESILIENT, SMART AND SUSTAINABLE CITIES



Co-funded by the  
Erasmus+ Programme  
of the European Union



**RESICITIES** is an education-oriented project funded by Erasmus+ aiming at the design and delivery of a programme for postgraduate students and academic staff undertaken by a group of four European universities.

**RESICITIES** – Resilient, smart and sustainable cities is a comprehensive programme composed of 5 courses organised by 4 Top European Universities. The first course aims to set the scene and introduce the theme, being fully online. The other 4 courses encompass two parts: a theoretical online part, and an immersive week in the respective countries. The participation is free of charge as it is granted by the Erasmus+ programme.



## HOW DOES IT WORK?

The course will grant ECTS and a certificate.

Participation in the immersive weeks is not mandatory for the students to achieve a certificate, but it is a good opportunity for students to know different contexts and ecosystems, to meet foreign lecturers in person, and to establish international networks with other students and companies.

Students willing to participate in the immersive week in a foreign country will receive an allowance.





# GET TO KNOW OUR COURSE

CIRCULAR ECONOMY

## COURSE DESCRIPTION

Today, economic growth depends primarily on increasing resource consumption. In this linear economic approach, companies harvest or extract materials, use them to grow or make products, and then sell these products to consumers.

The waste materials are then burned or landfilled. As the population grows and resources become scarcer, this 'extract-produce-discard' approach is rapidly reaching its limits. Increasingly attracting attention, the circular economy philosophy is an emerging field of study that favours a systemic and transdisciplinary approach. The circular economy is an economy that is restorative and regenerative in nature, and aims to keep products, components and materials at their highest utility and value at all times<sup>1</sup>.

Cities worldwide are facing a number of challenges including resource depletion, climate change and degradation of ecosystems. If cities do not adapt their current infrastructure and resource management, they will not be able to cope with these challenges. Nature-Based Solutions (NBS) or Green Infrastructure (GI) solutions are one element that can help to achieve this transition. NBS and GI can provide mutual ecosystem services such as regulation of micro-climates, flood prevention, water treatment and food provision which are beneficial for the urban environment<sup>2</sup>.

Applied to urban context, a circular city is where we apply the concepts of circular economy, i.e. waste management, commodities and energy used in smarter and more efficient ways. A circular city results in less pressure on the environment, new business models, innovative designs and new alliances and cooperation between different stakeholders. It is also a new economic model for distributing resources equitably without harming the functioning of the biosphere. It decouples economic growth from resource consumption.

In this course, we will introduce (1) Circular Economy in the context of resilient, smart and sustainable cities, then we will cover the (2) Digital Transformation in the circular Economy. We will see how (3) eco-design is a condition to circular economy and finally we will present (4) the circular urban metabolism, in a systemic approach to smart and sustainable cities.

<sup>1</sup>UNDP-Handbook-on-Smart-Urban-Innovations-V2.pdf

<sup>2</sup>Microsoft Word - CA17133\_Deliverable-2\_State-of-the-art\_v3.docx (circular-city.eu)





## DATES

Online courses: February 6-9, 2023

From 10am to 12pm CET

From 9am to 11am WET

**ARE YOU READY? APPLY [HERE](#).**

## BLENDED MOBILITY WEEK

March 6-9, 2023, IPAG Business School, Paris

As a learning and experiential add-on to the Academic Programme on “smart cities and urban innovation”, IPAG Business School will offer an intensive international mobility week, to take place in Paris, from the 6th to the 9th of March 2023.

## ECTS

- Attendance to the online classes grants 3 ECTS;
- Attendance to the online classes + mobility week grants 5 ECTS.





## COURSE OBJECTIVES

### Knowledge

- Explain the fundamental principles, technologies, current applications and future trends in circular, sustainable and smart cities.
- Introduce the concepts, framework and key technologies of smart city in different fields.
- Understand the role and functions of various technologies for circularisation (IoT, 3D Printing, sensors, RFID, Cloud computing) that can be used for implementing smart and circular cities.
- Describe the concept of a smart city and key challenges/problems facing professionals in cities around the world.
- Understand how the smart city is managed from an urban governance perspective.
- Understand how digitalization support circular economy models implementation.

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## Skills

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- Familiarise with key technologies in designing and implementing solutions for circular, smarter and more sustainable cities.

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- Analyse the city as a metabolism.

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- Study circular business models.

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- Propose managerial recommendations based on an empirical case study.

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- Conduct a detailed study on how to make a circular, sustainable and smart city.

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## Methods (Lectures, Case studies, Group presentations, Group work, Videos)

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Evaluation mode	%	Description
Assessment during course	50	Quiz (February 6-9, 2023)
Group presentation	50	Project (March 6-9, 2023)

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**PROGRAMME DIRECTOR****Pr Dominique Bonet Fernandez**

Director of Circular Economy Chaire  
Head of Strategy & Management Department  
IPAG Business School

**PROGRAMME****Programme of Online Courses, WEEK OF FEBRUARY 6, 2023**

- Module 1 - Circular economy in the context of resilient, smart and sustainable cities  
**IPAG - February 6, 2023**
- Module 2 - Digital transformation in the circular economy  
**IPAG - February 7, 2023**
- Module 3 - Eco-design and circular economy principles  
**IPAG - February 8, 2023**
- Module 4 - Circular urban metabolism  
**IPAG - February 9, 2023**
- + Mobility week in Paris **(6-9 March 2023)**

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**Module 1 - Circular economy in the context of resilient, smart and sustainable cities****IPAG – February 6, 2023**

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Programme:

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- **Introduction to the Circular Economy / Class Overview.** In this class, we'll begin to investigate the limitations of our current linear economy. We'll discuss the risks of continuing on the current trajectory and start to explore what an alternative - a circular economy - could look like.
  - **Circular Economy at the City and Region Level.** Cities will contain the vast majority of the world's population by 2050. We'll discuss how circular economies could be created in cities and regions, including the idea of industrial symbiosis, where "waste" materials from one industry become input materials for an entirely different industry.
  - **Supply Chains.** The technical cycles include the reuse, repair, and recycling of products, parts and materials. This class will review how these cycles are sometimes more challenging than initial product production and shipment, and discuss the difference between closed and open loop material flows.
  - **Business Models.** The circular economy philosophy promotes a reconsideration of business models, including offering products "as a service" instead of selling products and transferring ownership to consumers. We'll explore some of the opportunities and challenges of these circular business models.
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**Module 2 - Digital transformation in the circular economy****IPAG – February 7, 2023**

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Programme:

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- Introduction to urban environment: facts, figures, digital technologies, infrastructure, and social political forces.
  - Definition of Smart Cities through case studies, particularly the French case study of Issy-les-Moulineaux.
  - Concepts, framework and key technologies of smart cities in different fields.
  - Critical analysis of technologies shaping new and existing cities.
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**Module 3 - Eco design and circular economy principles****IPAG – February 8, 2023**

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Programme:

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- Definition, process and strategy for ecodesign.
  - Circular economy with ecodesign.
  - Some case studies.
  - Cities as circular bio economy hubs.
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**Module 4 - Circular urban metabolism****IPAG – February 9, 2023**

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Programme:

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- Designing an urban ecosystem, global architecture of the subsystems.
  - Subsystems: water, energy, urban transport, interurban transport, housing, health, living environment etc.
  - Urban metabolism.
  - Behavioral criteria of the humans who live in this ecosystem.
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## Registrations

The attendance of the full online/asynchronous sessions is free.

Scholarships available for the immersion weeks.

For more information please contact:

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/ University of Porto



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