

Sustainable Mobility and Ecocities

Code: 43064
ECTS Credits: 9

Degree	Type	Year	Semester
4313784 Interdisciplinary Studies in Environmental, Economic and Social Sustainability	OT	0	2

Contact

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Use of Languages

Principal working language: english (eng)

Teachers

Oriol Marquet Sardà
Johannes Langemeyer
Francesc Baró Porrás
Carles Gasol Martínez

Prerequisites

There are no specific recommendations

Objectives and Contextualisation

The cities on the planet, although they only occupy less than 3% of the total surface area, concentrate more than 50% of the population and have 80% of the greenhouse gas emissions associated. Construction and mobility represent more than 75% consumption of energy resources. In this module, the student is approached to new scenarios for the future of eco-cities through tools and methods for the environmental improvement of cities as well as the management of mobility and transport in an urban environment.

1. Form theoretical concepts about sustainable mobility and eco-cities.
2. Approach students to the new scenarios of the future of the urban world from the new paradigms of sustainability.
3. Facilitate the integration of environmental, social and economic aspects in the analysis of cities.
4. Present tools and methodologies for the environmental improvement of cities at different scales: buildings, neighbourhoods and urban environments.
5. To train students in the urban metabolism and in the social, environmental and economic costs that daily mobility implies.
6. Introduce the student methods, tools and actions prevention of environmental impacts of cities and their transport models against hegemonic public policies.
7. Present instruments for management, cross-cutting strategies and citizen participation in sustainable mobility and eco-cities through case studies.

8. Work in an international and multidisciplinary context.

Competences

- Analyse, summarise, organise and plan projects related to the environmental improvement of product, processes and services.
- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
- Work in an international, multidisciplinary context.

Learning Outcomes

1. Design research projects that contain proposals and contributions to knowledge of sustainable mobility.
2. Formulate action plans and environmental improvement plans.
3. Know the Agenda 21 tools for sustainable urban development.
4. Know the tools of eco-innovation that are applicable to urban environments.
5. Propose and assess self-sufficiency strategies in cities.
6. Support the strengthening of the social capacity of public and private bodies, at different levels, by providing knowledge towards the task of seeking out solutions to a wide variety of situations within the urban space, from an environmental perspective.
7. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
8. Work in an international, multidisciplinary context.

Content

There are two parts: **PART 1 SUSTAINABLE MOBILITY & PART 2 ECO-CITIES**

PART 1 (4.5 ECTS)SUSTAINABLE MOBILITY (Prof. Dr. Oriol Marquet)

In recent years, mobility and transport, both in academia and in public policies, have been the object of an enormous analytical and applied transformation. The subject under study has shifted from transport to everyday mobility, which implies changing the analytical focus from the supply side to the demand perspective. At the same time, a dialectical or congruent methodological approach has been incorporated, replacing the more traditional causal approach, all framed within the innovation that has meant moving on from the paradigm of modernity to that of sustainability. These changes began in the 80s of the 20th century, after the great economic crisis of the 70s, when oil began to show signs of being a finite energy source and public transport policies had to be rethought, especially in cities and metropolitan areas. In recent years, we have witnessed a transformation process that has implied the abandonment of the modernity paradigm, which largely shaped the twentieth century, and the adoption of that of sustainability, which is regarded as the guiding principle of the 21st century.

Sustainable mobility is expressed through daily trips that pollute less and that use less energy, that is, the non-motorized transport modes (walking and cycling). However, these transport modes require urban characteristics that allow their use: adequate public spaces and destinations close enough for you to get on a bike or walk, within a reasonable time and with an adequate effort. The urban variables that allow this type of mobility come together under the concept of compactness, a dense urban space, where density and mixture of urban functions is the most appropriate.

1. The analysis of urban mobility under the new paradigms of the 21st century.
 - From modernity to sustainability.
 - From transport to mobility.
 - The dialectic between mobility and the city

1. Urban planning and daily mobility.

- The genesis of modern everyday mobility.
- Modern urbanism and mobility.
- Sustainable cities, less polluting transport.

1. Sustainable mobility. New scientific framework and new political challenge.

- Energy consumption of transport modes.
- Characterization of transport emissions.
- The modal split and the costs of mobility.
- European policy and sustainable mobility.

1. The impacts of mobility

- The environmental impacts.
- Social impacts.
- Health impacts
- The economic costs

1. The challenges of mobility

- Towards a sustainable mobility.
- Accessibility.
- Future of mobility

PART 2 ECO-CITIES (prof. Dr. Carles Martínez Gasol, Dr. Francesc Baró, Dr. Johannes Langemeyer)

The cities on the planet, although they only occupy less than 3% of the total surface, concentrate more than 50% of the population and have 80% of the greenhouse gas emissions associated. In some European countries the cycle of construction and mobility represent more than 75% consumption of energy resources. In this context, urban ecology is key to improving future regional development and urban systems. The objectives of this module are the application of tools to facilitate urban sustainable development. Classes will be articulated in the following sub-blocks:

1. ECO-CITIES. (Professor: Dr. Carles Martínez)

- Urban answers to complex situations. The urban ecosystem. Ecosystem analysis. Data, tools, and preliminary concepts. Tools for urban sustainable development: urban metabolism.

1. THE FERTILE CITY. (Professor: Dr. Carles Martínez, Dr. Francesc Baró and Dr. Johannes Langemeyer)

- Urban agriculture is the backbone of the cities of the future. Tools: LCA and carbon footprint applied to quantify the impact of food production in cities.

1. ECOINNOVATION PUBLIC SPACE. (Professor: Carles Martínez)

- Application of eco-design tools and Life Cycle Assessment in the improvement of urban elements. Energy characterization of urban spaces: SIG + ACV.
- Ecosystem services (Professor: Dr. Francesc Baró and Dr. Johannes Langemeyer)
- Concepts, methodologies and instruments for research and applied use.

1. BUILDING. ECOINNOVATION IN BUILDINGS. (Professor: Dr. Carles Martínez)

- Energy renovation. Energy efficiency. Water saving and rainwater management, waste management and biodiversity. Eco-innovation in sustainable construction. Use of materials with low energy content. Self-sufficient buildings.

Methodology

Master classes and problem solving and case studies.
 Learning based on real cases.
 Presentation and oral presentation of research works developed.
 Participation in complementary activities.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Complementary activities	13	0.52	
Lessons	54	2.16	
Type: Supervised			
Final work	71	2.84	
Reading of papers	30	1.2	
Reading of teaching material	12	0.48	
Type: Autonomous			
28/5000 Readings related to the subject	20	0.8	

Assessment

Evaluation of the first part (Sustainable Mobility)

- Class attendance, active participation, field work and complementary activities (30%);
- Exam (70%)

Evaluation of the second PART (Ecocities)

- Delivery of papers (comment of papers) (60%)
- Oral defense of the same (20%)
- Written test (20%)

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Assistance and active participation in class	10%	5	0.2	3, 4, 6, 7, 8
Assistance to field work and complementary activities	10%	15	0.6	4, 6, 7, 8
Course work	60%	0	0	3, 4, 1, 6, 2, 5, 7, 8
Defense of course work	20%	5	0.2	3, 4, 1, 6, 2, 5, 7, 8

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Software

Word, excel or similar