

MSc European Forestry

January 2023



MSc Spatial and Ecological modelling in European Forestry SEE-Forestry

The Med Environment

University of Lleida
The School of Agrifood and
Forestry Science and Engineering



Cristina Vega-Garcia



Universitat de Lleida



About Lleida...

Airport Lleida Alguaire



Universitat de Lleida



Train Station Lleida- Pyrenees



La Llotja Congress Hall



Fountain Square La Pau



La Mitjana Park

About Lleida...



- ✓ Located south of the Pyrenees (100 km)
- ✓ Near to Barcelona (150 km)
- ✓ Mediterranean climate
- ✓ Population is 140.000



JAZZ TARDOR
XXV FESTIVAL de JAZZ de LLEIDA



Location

Environmental gradient: From arid steppe lands to alpine high mountains



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Our location is suitable for study and research in the fields of agriculture, stockbreeding, food technology and environmental and forest sciences.



The topographic gradient allows for a great diversity in forest and wildland environments: coastal, grasslands, riparian, shrublands, woodlands, forest:



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EFFC 2018



Forest dominated by deciduous or semideciduous thermophilous species, mainly *Quercus pubescens*



Broadleaved evergreen oak forest (holm and cork oak)



Xerophytic forests dominated by coniferous species (pines, firs, junipers, cypress)



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**History has left an imprint in the Mediterranean forest:
seminatural forests at best, cultural landscapes, high biodiversity**



**Recently developed young
forests challenging for
silviculture**

University of Lleida



Universitat de Lleida

- ✓ Founded in 1297 "Estudi General"
- ✓ 7 Faculties and 2 affiliated centers
- ✓ 5 Centers of technological innovation
- ✓ 30 Scientific-Technological Services
- ✓ 61 Research groups and +800 researchers



- ✓ 11.000 Students
- ✓ 10 Students/Teacher ratio



School of Agrifood and Forestry Engineering and Veterinary Medicine

R+D+I (2021 year)	
Structures	
Research Groups	61
Research Institutes	5
Chairs	17
Research resources	
Research Funding	18,13 M €
Research results	
Web Of Science (WOS) Publications	943
1st Q Publications	59%
Essential Science Indicators (ESI) Articles	82

TEACHING (2021-22 academic year)	
Schools	
7 Faculties and Schools	
49 Bachelor's Degrees	
16 Double Bachelor's Degrees	
31 Master's Degrees	
14 Doctoral Programmes	
6 Doctoral Programmes with Excellence Award	
Affiliated Schools	
4 Affiliated Schools	
3 Bachelor's Degrees	
6 Master's Degrees	
Center for Lifelong Learning	
80 Own Master's degrees	
53 Own Post degrees	
134 Other continuing education courses	



✓ <http://www.udl.cat/ca/udl/figures/>

✓ <http://www.udl.cat/ca/serveis/oficina/Noticies/La-UdL-21a-del-mon-en-educacio-de-qualitat-al-THE-Impact-Ranking/> related to SDGs achievement in 766 universities of 85 countries (21th teaching quality/601)

School of Agrifood and Forestry Engineering and Veterinary Medicine

INTERNATIONAL ACTIVITY	
Teaching (2021-22 academic year)	
Foreing Master's Degrees Students	10,1%
Foreing Doctoral Programmes Students (2020-21)	14,3%
Incoming students on mobility programmes (2020-21)	88
Outgoing students on mobility programmes (2020-21)	207
Foreign students on the Study Abroad programme	0
Degrees with international agreements	15
International networks in which the UdL participates	13
R+D+I (2021 year)	
Foreign research staff	8,4%
European research funds	13%
Foreign contracts and services	16%
International collaboration publications	43%



✓ <http://www.udl.cat/ca/udl/figures/>

✓ <http://www.udl.cat/ca/serveis/oficina/Noticies/La-UdL-21a-del-mon-en-educacio-de-qualitat-al-THE-Impact-Ranking/> related to SDGs achievement in 766 universities of 85 countries

Departments

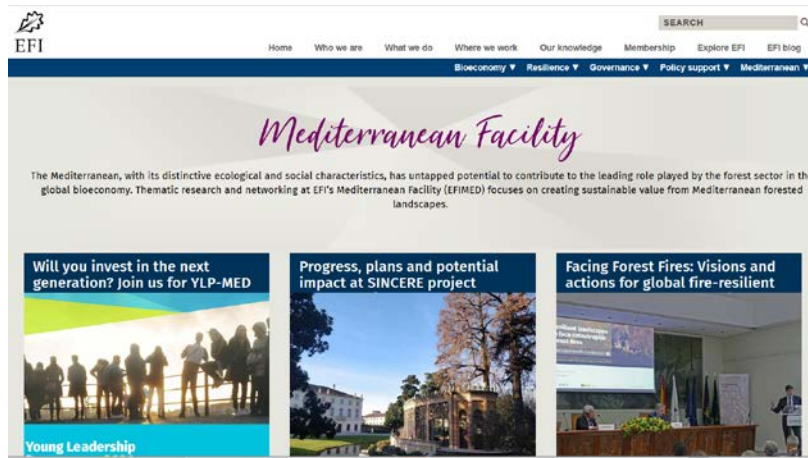


- ✓ Agriculture & **Forest Engineering**
- ✓ Animal Science
- ✓ Chemistry, Mathematics
- ✓ Crop and **Forest Sciences**
- ✓ Environment and Soil Sciences
- ✓ Food Technology
- ✓ Natural Resources Administration and Management
- ✓ Horticulture, Botany and Gardening

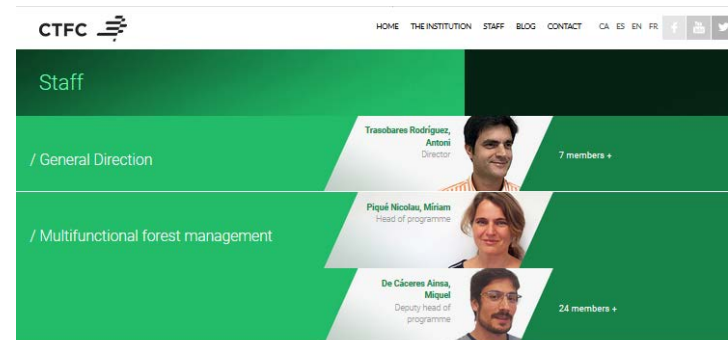


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Researchers & other collaborating institutions



Associació de Propietaris de l'Alt Empordà
Associació de Propietaris Forestals Berguedà Verd
Diputació de Barcelona
Associació d'Iniciatives Rurals de Catalunya (ARCA)
Associació per la Gestió Forestal de la Baronia de Rialb
Ajuntament de la Baronia de Rialb
Serveis Territorials del DARP
Associació de Propietaris Forestals Serra Miralles-Orpinell
Ajuntament de Vallcebre



Head of group



Casals Tortras, Pere



Coll Mir, Lluís
Forest Functioning & Dynamics



De Cáceres Ainsa, Miquel
Vegetation Modeling



Piqué Nicolau, Miriam
Sustainable forest management



Rovira Castellà, Pere A.
Soils and fertilizers

Researchers / Specialists



Améztegui González, Aitor
Forest Functioning & Dynamics



Beltrán Barba, Mario
Sustainable forest management



Coello Gómez, Jaime
Sustainable forest management



Domènech Jordi, Rüt
Sustainable forest management

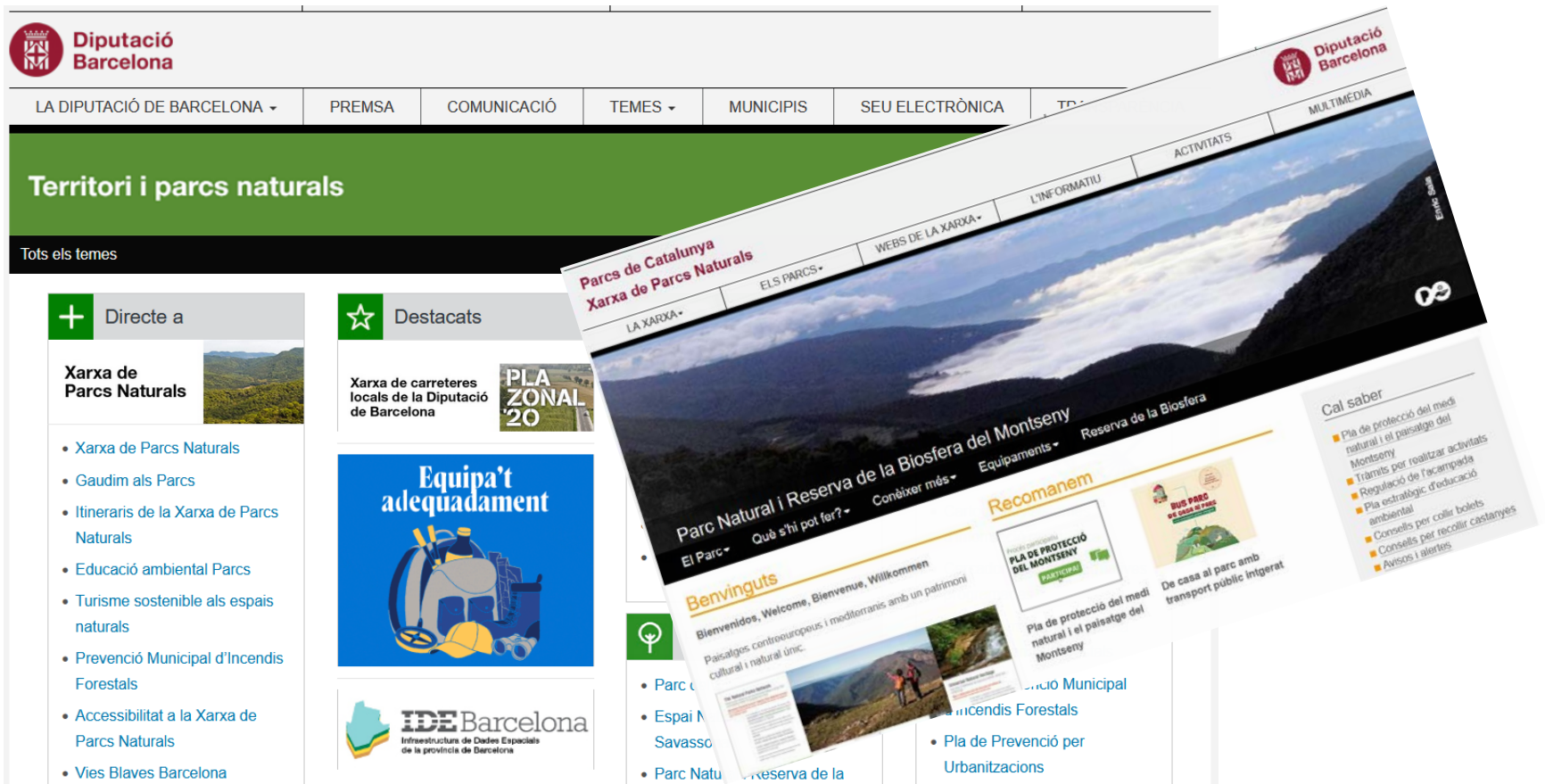


García Pausas, Jordi



Taüll Taüll, Marc

Researchers & other collaborating institutions



Part of the Campus IBERUS of International Excellence



Campus Iberus

Our programmes

BSc Degrees

- ✓ Biotechnology
- ✓ Animal Health and Science & Veterinary Sciences
- ✓ Food Science and Technology
- ✓ Agricultural and Food Engineering
- ✓ Forest Engineering

PhD Programmes

- ✓ Agriculture and Food Science and Technology
- ✓ Forests and Environmental Management

<http://www.udl.cat/ca/estudis/doctorat/en/programes-de-doctorat/gestio-forestal-i-del-medi-natural/>

Master Programmes Agr. & Food Science:

- ✓ Agri-Food Systems Research
- ✓ Agronomic Engineering
- ✓ Integrated Pest Management
- ✓ Management and Innovation in the Food Industry
- ✓ Plant Breeding
- ✓ Soil and Water Management
- ✓ Swine Health and Production

Master Programmes Forest Science:

MSc European Forestry-SEE Forestry Erasmus mundus

- ✓ Integrated Planning for Rural Development and Environmental Management
- ✓ Wildland Fire: Science and Management
- ✓ MSc Forest Engineering
- ✓ MSc MEDFOR Erasmus mundus



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European Forestry in Lleida

Modular programme

Year 1

Module 1 – Professional Knowledge Improvement, 12 ECTS

- Trends in European Forestry, 5 ECTS
- Academic Skills in Forest Sciences, 1.5 ECTS
- Research Methodology in Forest Sciences, 3.5 ECTS
- Global Virtual Seminar, 2 ECTS

Module 2 – Practical perspective and industrial visits, 18 ECTS

- European Forestry Field Course, 8 ECTS
- Applied Period in Forest Institutions, 10 ECTS

Elective Courses, 30 ECTS

Year 2

Module 3 – Specialization within Study Tracks, 30 ECTS, MSc Thesis and Online Thesis Seminar, 30 ECTS

- Track 1: Decision support systems for resource management
- Track 2: Resource management for ecosystem services
- Track 3: Spatial and ecological modelling
- Track 4: Resource economics and policy
- Track 5: Forest silviculture and engineering
- Track +: Global perspective

European Forestry Forum, Graduation Ceremony

The University of Lleida offers three online courses, which our students will be able to choose during the 1st or 2nd academic year:

Online course name	ECTS
111017 Forest dynamics in a global change context: drivers, processes and modelling approaches	5
111018 Stand to Continental Forest Health Management	5
111019 Introduction to Spatial Statistics: Spatial analysis with R	5



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List of Tracks:

- Track 1: Decision support systems for resource management (Coordinator AgroParisTech), including Forest Informatics and Precision forestry.
- Track 2: Resource management for ecosystem services (Coordinator: BOKU), including Carbon resource management, Resource efficient bio-resource analysis, Precision forestry.
- Track 3: **Spatial and Ecological modelling (Coordinator: University of Lleida), including Production ecology, and Spatial modelling technology, Natural hazards and risks.**
- Track 4: Resource economics and policy (Coordinator: University of Freiburg), including Applied forest bio-economy, Environmental policy/governance, New bio-materials and Economics of multipurpose forestry.
- Track 5: Silviculture and Engineering in Eastern Europe (Coordinator: TU Brasov developed during the first 2 years).
- Track +: Global perspective (a standard track 1, 2, 3 or 4 in Europe + additional studies with global Associate Partners in Canada, China, or Brazil).

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List of Elective Courses SEE Forestry:



Groups	Code	Course name	ECTS
Methods and tools in spatial analysis and ecological modelling (27 ECTS)	111001	ST in Mapping and Monitoring Forest Natural Resources	3
	111002	ST in Spatial Statistics	5
	111003	ST in Methods in Hazard Analysis and Risk Assessment	3
	111004	ST in Global Environmental Change and invasive species	3
	111005	ST in Precision Forestry	3
	111006	ST in Multi-Scale Forest Dynamics Models	5
	111022	ST in Data management and visualization with R	5
Understanding Spatio-Temporal ecological processes (23 ECTS)	111007	ST in The Earth system in a time of change	5
	111008	ST in Landscape Ecology and Biological Connectivity	5
	111009	ST in Biodiversity and Ecology	5
	111010	ST in Disturbance Ecology and Forest Health	5
	111021	ST in Molecular forest ecology: from genes to management	3
Multi-Scale Management of Natural Resources (20 ECTS)	111011	ST in Resource Management and Planning for Ecosystem Services	5
	111012	ST in Decision Support Systems for Resource Management	3
	111013	ST in Forest Research & Development	3
	111014	ST in Bio-economy and Principles of Environmental sustainability	3
	111015	ST in Markets and Payments for Ecosystem Services	3
	111016	ST in European Resource Economics and Policy	3

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List of Elective Courses SEE Forestry:

http://www.europeanforestry.udl.cat/export/sites/EuropeanForestry/.content/documents/pla_estudis/pla_estudis-2019.pdf

These courses are designated as Special Topics (ST). Contents may be adapted to the needs of the students according to their academic goals and the Master Thesis topic. Instructors and contents may vary within the scientific limits of a Special Topic field yearly.



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EF Thesis in Lleida



- ✓ Potential for agro-forestry alley-cropping with valuable broadleaves in Central Catalonia
- ✓ Road metrics and fuels to optimize forest fire control
- ✓ Adult sampling and larva rearing of the cork oak pest *Coraebus undatus* (Coleoptera: Buprestidae)
- ✓ An analysis of wildlife suppression resources in 1998-2008 in Spain
- ✓ Assessing post-fire regeneration in a Mediterranean mixed forest using LIDAR technology and Artificial Neural Networks
- ✓ On the relationship between wildfires and reforestation in 1998-2008 in Spain
- ✓ Soil erosion modeling in an agro-forested catchment of NE Spain affected by gullying using SWAT
- ✓ A mobile terrestrial laser scanning application for characterizing Mediterranean vegetation structure along forest roads.
- ✓ Modelling nutrient cycling and *Pinus radiata* (D. Dau) growth under various management systems
- ✓ Genetic variation in water extraction patterns among populations of Aleppo pine: contributing sources to water consumption under common garden conditions in Eastern Spain
- ✓ Soil organic carbon dynamics after grassland abandonment in Alpine and Mediterranean mountains in North- Eastern Spain
- ✓ Decay fungi related to "Roig" red stain of *Castanea sativa* in Catalonia - A qualitative assessment of the fungi associated with the notorious Roig.
- ✓ Analysis of hydrologic regime and land cover change in a "paired watershed" system
- ✓ Dead wood structures and tree microhabitats in *Pinus nigra* forests of varying management histories in Catalonia
- ✓ Comparison of sustainable forest management on the VPA and FSC standard in Cameroon

EF Thesis in Lleida



2019

- ✓ Spatial prioritization of management zones within protected areas for integration of competing objectives
- ✓ Modeling the influence of eucalypt plantations on wildfire occurrence and propagation in western Brazil
- ✓ Endophytic community responses associated with Diplodia shoot blight on four Pinus spp. in NW Spain
- ✓ Estimation of carbon stock and carbon sequestration of community forest in Siwalik region of Nepal
- ✓ The relationship between price and forest stands characteristics: a case study in a Romanian private company

2020

- ✓ Point Cloud Based Algorithm for Individual Tree Detection
- ✓ Analysis of the management interventions for forest fire prevention in “ZAP” (Zones d’Actuació Prioritària) of Province of Barcelona
- ✓ Planning evacuation routes for wildfires in Central Catalonia by analysing transport networks under extreme fire behavior.

Recent topics

2022

- ✓ Modelling Commercial Thinning (CT) regimes for timber production in interior British Columbia, Canada
- ✓ Connectivity of protected areas in Colombia: Identification and prioritization of potential corridors
- ✓ Anticipating future extreme wildfire events by predicting ignition probability and success in initial attack in Catalunya
- ✓ Response of ecosystem services to close-to-nature and traditional forest management in sub-humid Mediterranean forests
- ✓ Economic assessment of consumer preferences and willingness to pay for forest ecosystem services in France

Thesis output/format



ELSEVIER

Contents lists available at [ScienceDirect](#)

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman



Research article

Trajectories of wildfire behavior under climate change. Can forest management mitigate the increasing hazard?



Lauma Elza Miežīte^{a,b}, Aitor Ameztegui^{b,c}, Miquel De Cáceres^d, Lluís Coll^{b,c}, Alejandra Morán-Ordóñez^{d,e}, Cristina Vega-García^{b,c}, Marcos Rodrigues^{f,g,*}

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^d Ecological and Forestry Applications Research Centre (CREAF), Edifici C Campus de Bellaterra, 08193, Cerdanyola Del Valles, Spain

^e Forest Science and Technology Centre of Catalonia (CTFC), Ctra. St. Llorenç de Morunys, Km. 2, 25280, Solsona, Spain

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ARTICLE INFO

Keywords:

Fire behavior

Climate change

Forest dynamics

EU-forest policies

Fuel moisture

ABSTRACT

Mediterranean forests and fire regimes are closely intertwined. Forest dynamics and wildfire activity, ultimately threatening the provision of ecosystem services to society. In this paper we evaluate future wildfire behavior by using models of forest dynamics and wildfire hazard. To do so, we consider different narratives related to EU forestry (promotion of forest management, biomass production and business-as-usual) under the RCP 2.6 and RCP 8.5 scenarios. We used as a study model pure submediterranean Pinus sylvestris forest dynamics were simulated from the 3rd National Forest Inventory based on climate projections under RCPs 4.5 and 8.5. The climate conditions (both live and dead) and wind speed. Fuel moisture was related, selecting crown fire initiation potential and rate of spread as the trade-offs between forest dynamics, climate and wildfire. Despite forest management modulates fire behavior, resulting in different trends depending on the climatic pathway. In general, the maintenance of current practices would result in the highest rates of crown fire activity, while management for water vulnerability reduction is postulated as the best alternative to surmount the increasingly hazardous conditions envisaged in RCP 8.5.

Research Article

Influence of thinning intensity and frequency on the provision of ecosystem services in Mediterranean mountain pine forests under climate change scenarios

Diana Cristina Simon, Aitor Ameztegui

This is a preprint; it has not been peer reviewed by a journal.

<https://doi.org/10.21203/rs.3.rs-1720728/v1>

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Abstract

Thinnings are silvicultural operations that repetitively reduce tree density to improve the ecological, economic, and social benefits of the stands. Thus, the correct choice of the thinning regime can enhance stand structure and the provision of various ecosystem services throughout the rotation period. In this study, we use a modelling approach to evaluate stand dynamics and the provision of ecosystem services (mushroom production, wood for timber, carbon storage, blue water, and habitat for biodiversity) in Mediterranean mountain pine forests under different thinning regimes – defined by intensity and frequency – and under two different climate change scenarios. We implemented the thinning regimes using SORTIE-ND, an individual-based model that simulates forest dynamics, and then we integrated models developed for the study area to calculate the provision of services. We used as a case study a *Pinus sylvestris* and a *Pinus*

European Forestry in Lleida



Universitat de Lleida

Student Support (ORI & Assistant), Pere Gelabert:

- ✓ Scholarships for self-paying (2000 €),
- ✓ Funding for conferences and thesis-related needs
- ✓ 2 Residences & private flats ((150)200-350€/ month)
- ✓ Welcome week and cultural orientation, Sports Club
- ✓ Semester: mid-September-January; Feb-June (Sep)
- ✓ Thesis deadline 30th September but we aim for JUNE
- ✓ Free Languages Courses at the Lang. Institute-UdL



HOME / FLATS

Flats

La Vila de Lleida consists of 150 apartments of different types for 1 or 2 people. All the flats come complete with the following:

- Fully equipped bathroom
- Fully equipped kitchen and vitro-ceramic hotplate
- Microwave
- Fridge
- Hot water heater
- Desk and chairs
- Dining room table and chairs
- Wardrobe and shelving
- Phone and TV jack
- Free internet connection by RJ-45 connector
- Air- conditioning
- Central heating
- Individual electricity and water meter
- Bed 200×90cms (single bed size)

TOUR ONLINE!

All the flats have outside views and are equipped ready for you to move in.



Tipos de viviendas



Habitación doble



Habitación individual



Dos habitaciones individuales



Adaptados de una habitación

Imágenes



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Thanks!!!



@ETSEA_UdL



ETSEA

