Servizo de Relacións Exteriores
Colexio de San Xerome
Praza do Obradoiro, s/n
CP 15782 Santiago de Compostela

Campus Terra International Doctorate School

Campus of Excellence Campus Terra, at Lugo city campus of USC

List of PhD programmes which students from Erasmus Plus International Credit Mobility partner institutions can apply to for a mobility period at USC as part of their doctorate studies at their home university.
Please also consult the **Science and Technology** list of programmes for further areas of Science and Engineering.
For procedures see footnote [i]:

HUMANITIES

Cultural Studies: Memories, Identities, Territories and Language

- Cultural Diversity and Identity
- Memory, Territory and Heritage
- Language, creations and cultures
- Interdisciplinary panorama of contemporary cultures

HEALTH SCIENCE

Basic and Applied Research in Veterinary Sciences

- Basic and applied research in Veterinary Sciences

Veterinary Medicine and Health

- Epidemological, immunological and molecular studies of parasitic and infectious processes that affect domestic and wild ruminants
- Biological control of parasitic infections
- Animal metabolism
- Food Hygiene
- Reproductive effectiveness / Reproduction technology
- Animal production systems
- Veterinary history

SCIENCE

Environmental and Agricultural Science

- Agricultural Production and Rural Development
- Natural Resources

ENGINEERING

Agricultural and Forestry Research

General lines of research:

1. Crop protection. Viticulture. Berries. Integrated production of potato.
2. Arbuscular mycorrhizae. Pests and diseases in agricultural, forest and ornamental plants. Berries. Tropical fruits. Woody ornamental plants. Grassland management.
3. Sustainable Forest management: health and silviculture
4. Vegetative propagation. Mycorrhization. Tree risk assessment. Crop integrated production and mycorrhization. Security and health prevention in the agroforestry sector.
5. Ecological botany in agroforestry.
6. Waste management in agriculture. Valuation of agricultural wastes and by-products. Manufacturing and use of soil amendments and fertilizers. Manufacturing and use of substrates. Water in agricultural soils.
7. Soil-plant-atmosphere systems. Physical properties of soil. Water in soil. Sensors for continuous recording in SPA system. Climatology in agriculture and forestry (UDC)

8. Agroforestry systems. Forest fire prevention. Silvopastoral systems. Medicinal and aromatic plants. Mycology. Forest and ornamental bonaty. Mycorrhizae. Weed control. Propagation of forest species. Forestation. Fertilization in agroforestry.
9. Vine biotechnology.
10. Plant genetic resources. Agronomy of crops. Crop modelling.
11. Agricultural and forest soils: nutrient dynamics, management and use of wastes. Macro- and micronutrient cycles. Agricultural and forest soil degradation. Agricultural chemistry and soil fertility. Soil management and conservation.
12. Genetics and breeding of domesticated plant species (CSIC)

Specific lines of research:

1. Antibiotics for human consumption in agricultural areas treated with sewage sludge and strategies for control using bioadsorbents: levels, adsorption, movility and transport (Researchers: Esperanza Álvarez Rodríguez; María J. Fernández Sanjurjo and Avelino Núñez Delgado)
2. *Dryocosmus kuriphilus* (asian chestnut gall wasp): preferences, resistance, control, etc (Lead Researcher: María Josefa Lombardero Díaz)

Sustainable Soil and Land Management

- Soil management
- GIS and territorial planning
- Remote sensing and LIDAR
- Landscape ecology
- Risk governance, and sustainability

Civil and Rural Engineering

Lines of research:

Modelling forest growth and productivity:
1. Site quality modelling in relation to site parameters
2. Diametric distributions
3. Stem profile equations and volume equations for product classification, implemented in computer programmes
4. Mortality equations
5. Equations for predicting and projecting basal area
6. Effect of competition on forest growth
7. Effect of pathogens on forest growth
8. Dynamic growth models for different species, implemented in forest management computer programmes
9. Compatibility of models on various scales
10. Combined use of aerial and satellite imagery, aerial and terrestrial LiDAR sensors and field data for forest inventories and monitoring natural resources
11. Use of remote sensing for large-scale forest inventories and forest stock mapping
12. Use of remote sensing for monitoring changes in forest activities caused by deforestation, forest degradation and natural disturbances
13. Use of remote sensing for classifying and stratifying homogeneous forest
14. Use of remote sensing for monitoring and identifying areas of particular interest for certain types of forest
15. Use of remote sensing for estimating main tree and stand-level forest variables

Forest management:
1. Computer applications for data collection and calculating the results of forest inventories
2. Forest management computer systems for elaborating and monitoring forest planning projects, integrated in a Geographic Information System (GIS)
3. Development of planning methods for protective zones and protected sites
4. Thinning trials in stands of different species
5. Management density diagrams for different species
6. Initial growth, nutritional status and health problems in chestnut plantations
7. Potential application of Continuous Cover Forestry (CCF) methods in Northern Spain
8. Joint forest management groups

Servizo de Relacións Exteriores
Colexio de San Xerome
Praza do Obradoiro, s/n
CP 15782 Santiago de Compostela

Forest biomass, energy plantations and carbon fixation:
1. Estimation of forest biomass in different species (trees and shrubs) and under different treatments
2. Short rotation forest plantations to produce raw materials for industry and/or energy production
3. Estimation of carbon sequestration in forest stands
4. Carbon contents of soils

Soil and forest nutrition:
1. Nutritional diagnosis by analysis of soils and vegetation
2. Soil fertility and fertilization
3. Biochemical cycles
4. Effects of land preparation
5. Recycling waste and by-products in agroforestry and environmental fields
6. Soil conservation
7. Restoration and decontamination of soil and water
8. Tropical soils

Forest certification:
1. Sustainable forest management in Galicia
2. Environmental, social and economic impacts of forest certification
3. Development of computer applications to simplify forest certification

Operational research applied to forest management:
1. Decision-making by multi-criteria analysis and software development
2. Optimization by linear programming

Timber properties:
1. Effects of silviculture and forest site on timber quality
2. Physical characterization of thinning and clonal forestry plantations
3. Influence of pathogenic fungi on hardwood properties

Analysis of timber structures:
1. Numerical simulation by finite elements of the resistance of timber destined for construction purposes
2. Optimization and calculation of timber structures and joints
3. Mechanical characterization of timber for structural purposes
4. Application of non-destructive techniques for classifying structural timber
5. Numerical simulation in structures

Forest health:
1. Effects of insect pests on the quality, growth and production of forest stands
2. Invasive species
3. Dynamics of forest insect populations: effects of temperature, plant nutrient status and defence system, microorganisms and fauna associated with growth, survival and reproduction of forest insects, in the current context of global change

Forest fires:
1. Modelling the moisture content of dead fuels in forest areas
2. Determination of seasonal patterns of moisture content in live fuels in forest areas
3. Modelling structural variables of the surface fuel characteristics that determine the flammability and combustibility of shrub land
4. Modelling structural variables of the tree canopy related to initiation and propagation of crown fire

5. Cataloguing fuel types using the criteria outlined in the “Photo- guide to forest fuels of Galicia and associated fire behaviour”
6. Evaluation of the efficacy of forest treatments in minimising forest fire risk
7. Effects of fire on forest soils
8. Remote sensing applied to forest fires

Projects and planning
1. Project Management (DIP)
2. Planning and Territorial Planning

3. Occupational Health & Safety
4. Life cycle analysis

Water management
1. Wastewater treatment facilities for small communities
2. Sustainable Management of Water Resources in Rural Areas
3. Satellital images to manage crops: line and full cover. Water Management
4. Hop fertigation: quality and quantity aspects. Conventional and organic production
5. Vineyard management: agronomic practices to fight with climate change
6. Hydrological models
7. Impact of climate change on water resources
8. Geophysical methods in groundwater and soil science

Coastal and maritime engineering
1. Marine energies: wave energy and tidal currents
2. Hydrodynamics of river. Environmental hydraulics. Littoral processes. Integrated coastal zone management
3. Artificial Intelligence applied to Maritime Engineering
4. Systems for the prevention of coastal pollution. Floating barriers of containment.

Transport infrastructure
1. Coastal and port structures
2. Development of high added value materials and products for road surfaces
3. Optimization of road layout and microsimulation in traffic engineering
4.Port management Planning and exploitation of ports

Geomatics
1. Surface Photogrammetry of Close Object. Terrestrial and aerial photogrammetry through drones. Cartoimages and DTM.
2. Environmental remote sensing. Treatment and analysis of aerial and space sensor images.
3. Scanning, modeling and printing 3D objects.
4. Documentation for heritage and archeology. Cataloging and inventory.
5. Study of deformations

Civil construction
1. Recovery of waste and co-products from the Galician agroindustrial sector in Civil Engineering.
2. Numerical modeling of geotechnical problems

Savings and energy efficiency
1. Monitoring, modelling and control of environmental, animal and productive variables on livestock farms
2. Implementation of renewable energies, sustainability and energy efficiency in rural areas

Management of native hardwoods for cooperage
1. Wood quality, technological aptitude (physical and chemical) and certification with improved product traceability, according to applicability in the industries gives first and second transformation
2. Sustainable development of the rural world: Planning, management and use of wood from deciduous leafy species in the cooperage industry

Agricultural mechanization
1. Precision agriculture. Smart Farming
2. Precision livestock. Mechanization of livestock farms
3. Potato working and harvesting systems and forage crops (forage corn and grassland)
4. Logistics management of machinery parks. Modeling, simulation and route management

Sustainable rural construction
1. Optimizing underground drainage networks for agricultural soils
2. Design of agricultural and food products.

Servizo de Relacións Exteriores
Colexio de San Xerome
Praza do Obradoiro, s/n
CP 15782 Santiago de Compostela

[i] **Students should follow the procedure indicated in the Calls for applications for 2019-2022, to be published Autumn 2019 onwards, taking into account**:

- The PhD Learning Agreement must contain a description of your PhD research so far and thesis plan
- It is **not** necessary to request an acceptance letter from the academic coordinators
- In any contact with USC PhD programme coordinators, please make it clear that you are applying for Erasmus Plus International Credit Mobility (KA107), and give the name of your home university
- ONLY the above areas are available; applications for other programmes will be rejected.
- USC External Relations Service will send acceptance-invitation letters to candidates applying through the correct channel for any of the above programmes provided the candidate complies with Erasmus+ eligibility criteria at their home University and fulfils USC selection requirements
- More information in English on each PhD programme can be found at: http://www.usc.es/doutoramentos/en