



## Teaching Guide

| Teaching Guide           |                                                                                                                                                                                                                                                                |        |                                  |           |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------|-----------|
| Identifying Data         |                                                                                                                                                                                                                                                                |        | 2018/19                          |           |
| Subject (*)              | Ecology and Biomonitorization                                                                                                                                                                                                                                  | Code   |                                  | 610500007 |
| Study programme          | Mestrado Universitario en Ciencias. Tecnoloxías e Xestión Ambiental (plan 2012)                                                                                                                                                                                |        |                                  |           |
| Descriptors              |                                                                                                                                                                                                                                                                |        |                                  |           |
| Cycle                    | Period                                                                                                                                                                                                                                                         | Year   | Type                             | Credits   |
| Official Master's Degree | 1st four-month period                                                                                                                                                                                                                                          | First  | Optional                         | 3         |
| Language                 | SpanishEnglish                                                                                                                                                                                                                                                 |        |                                  |           |
| Teaching method          | Face-to-face                                                                                                                                                                                                                                                   |        |                                  |           |
| Prerequisites            |                                                                                                                                                                                                                                                                |        |                                  |           |
| Department               | BioloxíaEnxeñaría Naval e IndustrialFísica e Ciencias da Terra                                                                                                                                                                                                 |        |                                  |           |
| Coordinador              | Ruiz De la Rosa, Jose Miguel                                                                                                                                                                                                                                   | E-mail | jose.miguel.ruiz.delarosa@udc.es |           |
| Lecturers                | Bao Casal, Roberto                                                                                                                                                                                                                                             | E-mail | roberto.bao@udc.es               |           |
|                          | Rodríguez Roiloa, Sergio                                                                                                                                                                                                                                       |        | sergio.roiloa@udc.es             |           |
|                          | Ruiz De la Rosa, Jose Miguel                                                                                                                                                                                                                                   |        | jose.miguel.ruiz.delarosa@udc.es |           |
| Web                      |                                                                                                                                                                                                                                                                |        |                                  |           |
| General description      | Ecology and evolution. Population dynamics. Organization of communities. Flows of matter and cycles of energy.<br>The case of tributyl tin (TBT) of antifouling paints: environmental history and biomonitoring in Galicia.<br>Paleoecology and biomonitoring. |        |                                  |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                            |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1   | Coñecemento das realidades interdisciplinares da Química e do Medio Ambiente, dos temas punteiros nestas disciplinas e das perspectivas de futuro.                                                                     |
| A6   | Coñecemento do comportamento de diferentes especies químicas e dos procesos aos que poden estar sometidas unha vez liberadas no medio ambiente, incluíndo as súas relacións entre distintos compartimentos ambientais. |
| A10  | Relacionar a presenza de especies químicas no medio natural cos conceptos de toxicidade e biodisponibilidade.                                                                                                          |
| A13  | Comprender os procesos de bioacumulación e as técnicas de biomonitorización e biomarcaxe.                                                                                                                              |
| B1   | Posuír e comprender coñecementos que acheguen unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, a miúdo nun contexto de investigación.                                           |
| B5   | Que os estudantes posúan as habilidades de aprendizaxe que lles permitan continuar estudando dun modo que haberá de ser en gran medida autodirixido ou autónomo.                                                       |
| B8   | Comprender, a un nivel especializado, as consecuencias do comportamento humano na contorna ambiental.                                                                                                                  |
| C6   | Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.                                        |

## Learning outcomes

| Learning outcomes                                                                                 | Study programme competences |            |     |
|---------------------------------------------------------------------------------------------------|-----------------------------|------------|-----|
| Describe and discuss ecological concepts at the individual, population and community level        | AC1                         | BC1<br>BC8 |     |
| Use some basic techniques of the broad ecological methodology                                     |                             | BC5        | CC6 |
| Understand the results of basic ecotoxicology techniques                                          | AC6<br>AC10<br>AC13         |            |     |
| Understanding the relevance of the sedimentary registry to define ecological reference conditions |                             | BC5        | CC6 |

## Contents

| Topic | Sub-topic |
|-------|-----------|
|-------|-----------|



|                                       |                                                                                                                              |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Ecology: theory                       | Ecology and evolution. Population dynamics.<br>Organization of communities. Matter flows and energy cycles. Gaia Hypothesis. |
| Ecology: practices                    | Population dynamics: competition and predation.<br>Spatial dynamics: metapopulations.                                        |
| The case of TBT of antifouling paints | Environmental history. Biomonitoring in Galicia.                                                                             |
| Paleoecology and biomonitoring        | Theory and practices.                                                                                                        |

| Planning                                                                                                                        |                              |                      |                               |             |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests                                                                                                           | Competencies                 | Ordinary class hours | Student's personal work hours | Total hours |
| Guest lecture / keynote speech                                                                                                  | A1 A6 A10 A13 B1 B8          | 12                   | 36                            | 48          |
| ICT practicals                                                                                                                  | B5 C6                        | 8                    | 16                            | 24          |
| Objective test                                                                                                                  | A1 A6 A10 A13 B1 B5<br>B8 C6 | 1                    | 0                             | 1           |
| Personalized attention                                                                                                          |                              | 2                    | 0                             | 2           |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |                              |                      |                               |             |

| Methodologies                  |                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Methodologies                  | Description                                                                                                                  |
| Guest lecture / keynote speech | Summary presentation of the contents available via Moodle (or virtual classroom).                                            |
| ICT practicals                 | The practices will be held in Aula Informática with the simulation programs available in the Faculty and others via the web. |
| Objective test                 | Written examination on the matter exposed and / or practiced.                                                                |

| Personalized attention                                             |                                                                                             |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Methodologies                                                      | Description                                                                                 |
| Guest lecture / keynote speech<br>ICT practicals<br>Objective test | The theoretical and practical sessions include tutoring sessions and personalized attention |

| Assessment                     |                              |                                                                                                 |               |
|--------------------------------|------------------------------|-------------------------------------------------------------------------------------------------|---------------|
| Methodologies                  | Competencies                 | Description                                                                                     | Qualification |
| Guest lecture / keynote speech | A1 A6 A10 A13 B1 B8          | Discussion in class about the theoretical contents of different disciplines.                    | 1             |
| ICT practicals                 | B5 C6                        | Participation in practicals is compulsory, as well as to perform the exercises exposed in them. | 1             |
| Objective test                 | A1 A6 A10 A13 B1 B5<br>B8 C6 | Written exam.                                                                                   | 98            |
| Others                         |                              |                                                                                                 |               |

| Assessment comments |
|---------------------|
|                     |

| Sources of information |
|------------------------|
|------------------------|



|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>         | Begon, M., J. L. Harper, y C. R. Townsend (1999) Ecología. Individuos, Poblaciones y Comunidades. Omega, Barcelona (3ª edición inglesa). Ricklefs, RE (1998) Invitación a la Ecología: La Economía de la Naturaleza. 4ª ed. Editorial Médica Panamericana, Buenos Aires, Argentina. Smith, RL. y Smith, T.M. (2000) Ecología. 4ª ed. Pearson Educación, SA. Madrid. de Mora, SJ (1996). Tributyltin: case study of an environmental contaminant. In: Campbell PGC, Galloway JN, Harrison RM (eds) Cambridge Environmental Chemistry Series No. 8. Cambridge University Press, Cambridge. Smol, J.P. 2002. Pollution of Lakes and Rivers. A Palaeoenvironmental Perspective. Arnold Publishers, London, 280 pp. |
| <b>Complementary</b> | La bibliografía básica es suficiente para un módulo de estas dimensiones.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|                                                                 |
|-----------------------------------------------------------------|
| <b>Recommendations</b>                                          |
| <b>Subjects that it is recommended to have taken before</b>     |
|                                                                 |
| <b>Subjects that are recommended to be taken simultaneously</b> |
|                                                                 |
| <b>Subjects that continue the syllabus</b>                      |
|                                                                 |
| <b>Other comments</b>                                           |
| This module is integrated with the others within the master.    |

(\*)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.