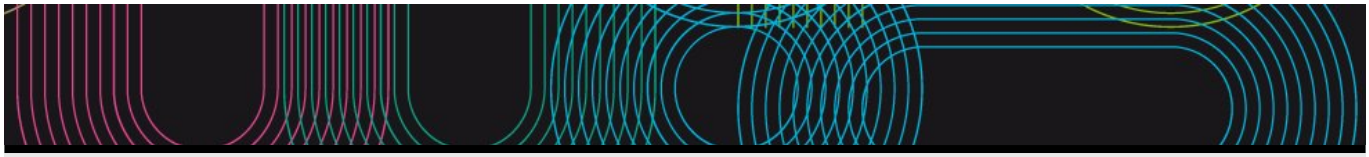
Universidade Vigo

Subject Guide 2018 / 2019



| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Marine Pollution and Ecotoxicology** | | | | |
| Subject | Marine Pollution and Ecotoxicology | | | |
| Code | V02M098V01206 | | | |
| Study programme | (*)Máster Universitario en Bioloxía Mariña | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| | 3 | Optional | 1st | 2nd |
| Teaching language | Spanish | | | |
| Department | Functional Biology and Health Sciences<br>External<br>Ecology and Animal Biology | | | |
| Coordinator | García Estévez, José Manuel<br>Barreiro Lozano, Rodolfo | | | |
| Lecturers | Barreiro Lozano, Rodolfo<br>García Estévez, José Manuel<br>Sánchez Marín, Paula | | | |
| E-mail | jestevez@uvigo.es<br>rodbar@udc.es | | | |
| Web | http://https://plus.google.com/+RodolfoBarreiroSP/posts | | | |
| General description | (*)A asignatura explora os métodos para detectar, cuantificar, e predecir os efectos dos contaminantes no medio mariño. Estes métodos son unha ferramenta fundamental para a protección e xestión do medio ambiente fronte ao perigo da contaminación. | | | |

| Competencies | |
|---|---|
| Code | |
| A1 | (*)Posuír e comprender coñecementos que acheguen unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, adoito nun contexto de investigación. |
| A2 | (*)Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornos novos ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo. |
| B1 | Utilización de criterios y métodos científicos en el planteamiento y resolución de problemas aplicando los conocimientos adquiridos |
| B4 | Desarrollo de habilidades en el manejo y tratamiento de herramientas, matemáticas, estadísticas e informáticas |
| B6 | Desarrollo de la curiosidad científica, de la iniciativa y la creatividad |
| C6 | Conocimiento, identificación y evaluación de la calidad ambiental del medio marino y de la legislación vigente. Dirección de consultorías ambientales |
| D1 | Desarrollo de las capacidades comprensivas, de análisis y síntesis |
| D2 | Desarrollo de la capacidad de razonamiento crítico y autocrítico |

| Learning outcomes | |
|---|---|
| Expected results from this subject | Training and Learning Results |
| Distinguishes and identifies the approaches of retrospective prospective ecotoxicology. | A1<br>A2<br>B1<br>C6 |
| Describes the typical effects of the pollution on individuals, populations and communities | A1<br>A2<br>B1<br>C6 |

| | |
|---|---|
| Assesses the advantages and limitations of each level of organisation to detect the impact of pollutants | A1<br>A2<br>B1<br>C6<br>D1<br>D2 |
| Understands the fundamentals of ecotoxicology assays, bioaccumulation-dpuration studies and biomarkers | A1<br>A2<br>B4<br>D1<br>D2 |
| Understands the relevance of the information provided by ecotoxicology assays | D1<br>D2 |
| Understands the fundamentals and limitations of the predictions derived from models of the distribution and effects of pollutants | D1<br>D2 |
| Is able to face the technical literature and place into context in the mainframe of ecotoxicology | B6<br>D1 |

**Contents**

| Topic | |
|---|---|
| Introduction and bioaccumulation (Retrospective ecotoxicology I) | Main environmental problems. Ecotoxicology. The concept of bioavailability. Factors of pollutant bioavailability. Use of bioacumulators. Requirements of a good bioaccumulator |
| Toxicokinetics | Kineticsl of pollutant accumulation. Concepts of Bioconcentración Factor (BCF), Bioaccumulation Factor (BAF). |
| Biomagnification along the food chain | Concept of biomagnification. Estimating trophic transfer and Biomagnification Transfer. Examples of *biomagnification and trophic dilution |
| Physiological effects | Main physiological detrimental effects used in ecotoxicology and biomonitoring. |
| Biomarkers (Retrospective Ecotoxicology II). | Classification, specificity and relation with adverse effects. Requirements of a biomarker. Examples of biomarker. |
| Toxicity assays (Prospective Ecotoxicology *I). | Concentration-response relationship. Types of assay: acute and chronic toxicity. Data analyses. Toxicity curves. LC50, NOEC, LOEC and MATC. |
| Prediction in ecotoxicology (Prospective Ecotoxicology II) | Species sensitivity distribution. Environmental risk assessment. |
| Changes in community composition (Retrospective Ecotoxicology III). | Bioindicator species. Relative abundance. Biotic indexes. Diversity indexes. Comparison with communities of reference. |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 16 | 40 | 56 |
| Problem solving | 4 | 12.5 | 16.5 |
| Autonomous problem solving | 1 | 0 | 1 |
| Objective questions exam | 1.5 | 0 | 1.5 |

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

**Methodologies**

| | Description |
|---|---|
| Lecturing | Master session |
| Problem solving | Computer sessions with specialized software. |
| Autonomous problem solving | Personal guidance to students through one-to-one meeting and/or using TICs. |

**Personalized attention**

| Methodologies | Description |
|---|---|
| Autonomous problem solving | Personal guidance to students through one-to-one meeting and/or using TICs. |

**Assessment**

| | Description | Qualification | Training and Learning Results | | | |
|---|---|---|---|---|---|---|
| Objective questions exam | A test | 100 | A1<br>A2 | B1<br>B4<br>B6 | C6 | D1<br>D2 |

## Other comments on the Evaluation

## Sources of information

### Basic Bibliography

### Complementary Bibliography

Newman, M. C., and M. A. Unger, **Fundamentals of Ecotoxicology**, 2,

Walker, C. H., S. P. Hopkin, R. M. Sibly, and D. B. Peakall., **Principles of Ecotoxicology**, 3,

Clark. R.B., **Marine Pollution**, 5,

## Recommendations