



## Teaching Guide

| Teaching Guide      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                                                |           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------|-----------|
| Identifying Data    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                                                | 2020/21   |
| Subject (*)         | Ecology II: Populations and Communities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        | Code                                           | 610G02040 |
| Study programme     | Grao en Bioloxía                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |                                                |           |
| Descriptors         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                                                |           |
| Cycle               | Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Year   | Type                                           | Credits   |
| Graduate            | 2nd four-month period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Third  | Obligatory                                     | 6         |
| Language            | Spanish                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |                                                |           |
| Teaching method     | Face-to-face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                                                |           |
| Prerequisites       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                                                |           |
| Department          | Bioloxía                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |                                                |           |
| Coordinador         | Rodríguez Roiloa, Sergio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | E-mail | sergio.roiloa@udc.es                           |           |
| Lecturers           | Barrientos De La Llana, Sara<br>Rodríguez Roiloa, Sergio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | E-mail | sara.barrientos@udc.es<br>sergio.roiloa@udc.es |           |
| Web                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |                                                |           |
| General description | Population ecology. Species interactions. Communities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |                                                |           |
| Contingency plan    | <p>1. Modifications to the contents:<br/>No changes will be implemented.</p> <p>2. Methodologies<br/>*Teaching methodologies that are maintained:<br/>Hybrid model: Theory 1/3 onsite (face-to-face teaching), 2/3 online via Teams. Seminars and Practicals 100% onsite<br/>Online model: All teaching methodologies will be carried out online (virtual tele-teaching).</p> <p>*Teaching methodologies that are modified:<br/>Online model:<br/>THEORY: Teaching Theory will be done online using Teams platform. Theory teaching materials will be available in Moodle.<br/>SEMINARS: Teaching Seminars will be done online using Teams platform. Seminar teaching materials will be available in Moodle.<br/>PRACTICALS: Practical activities will be adapted to non-required attendance and will be done online using Teams platform. Practical teaching materials will be available in Moodle.<br/>TUTORING: Tutoring will be maintained online using email and/or Teams video-conferencing.</p> <p>3. Mechanisms for personalized attention to students:<br/>Teams: Continuous individual tutoring (upon demand). Weekly group meetings.<br/>E-mail: Continuous individual tutoring (upon demand).<br/>Moodle: Continuous individual tutoring (upon demand). All teachings contents will be available in Moodle.</p> <p>4. Modifications in the evaluation:<br/>No changes will be implemented.</p> <p>*Evaluation observations:<br/>Online model: Deliverables reports, partial tests and final exam will be implemented via Moodle platform.</p> <p>5. Modifications to the bibliography or webgraphy:<br/>No changes will be implemented.</p> |        |                                                |           |

## Study programme competences

|      |                             |
|------|-----------------------------|
| Code | Study programme competences |
|------|-----------------------------|



|     |                                                                      |
|-----|----------------------------------------------------------------------|
| A1  | Recoñecer distintos niveis de organización nos sistemas vivos.       |
| A17 | Realizar bioensaios e diagnósticos biolóxicos.                       |
| A20 | Muestrear, caracterizar e manexar poboacións e comunidades.          |
| A21 | Deseñar modelos de procesos biolóxicos.                              |
| A24 | Xestionar, conservar e restaurar poboacións e ecosistemas.           |
| A26 | Deseñar experimentos, obter información e interpretar os resultados. |
| A30 | Manexar adecuadamente instrumentación científica.                    |
| B4  | Traballar de forma autónoma con iniciativa.                          |
| B6  | Organizar e planificar o traballo.                                   |
| B7  | Comunicarse de maneira efectiva nunha contorna de traballo.          |
| B8  | Sintetizar a información.                                            |
| B12 | Adaptarse a novas situacións.                                        |

| Learning outcomes                                                                      |  |                                 |                       |
|----------------------------------------------------------------------------------------|--|---------------------------------|-----------------------|
| Learning outcomes                                                                      |  | Study programme competences     |                       |
| Describe ecological concepts at individual, population, community and ecosystem level. |  | A1<br>A24                       |                       |
| Analytical discussion of ecological concepts.                                          |  |                                 | B8                    |
| Managing scientific literature.                                                        |  | A30                             |                       |
| Using basic techniques in ecology.                                                     |  | A17<br>A20<br>A21<br>A26<br>A30 | B4<br>B6<br>B7<br>B12 |

| Contents                        |                                                                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Topic                           | Sub-topic                                                                                                                                           |
| Section 1. Populations          | Unit 1. Size, structure and life cycles.<br>Unit 2. Population growth models.<br>Unit 3. Growth in natural populations.<br>Unit 4. Metapopulations. |
| Section 2. Species interactions | Unit 5. Competition.<br>Unit 6. Predation.<br>Unit 7. Mutualism.                                                                                    |
| Section 3. Communities          | Unit 8. Community structure.<br>Unit 9. Patterns in species richness.<br>Unit 10. Ecological succession, trophic structure and stability.           |

| Planning                       |                                                  |                      |                               |             |
|--------------------------------|--------------------------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests          | Competencies                                     | Ordinary class hours | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech | A1 A17 A20 A21 A24<br>A26 A30 B4 B6 B7 B8<br>B12 | 24                   | 60                            | 84          |
| Laboratory practice            | A1 A17 A20 A21 A24<br>A26 A30 B4 B6 B7 B8<br>B12 | 15                   | 15                            | 30          |



|                           |                                                  |   |    |    |
|---------------------------|--------------------------------------------------|---|----|----|
| Seminar                   | A1 A17 A20 A21 A24<br>A26 A30 B4 B6 B7 B8<br>B12 | 8 | 8  | 16 |
| Multiple-choice questions | A1 A17 A20 A21 A24<br>A26 A30                    | 0 | 1  | 1  |
| Case study                | A1 A17 A20 A21 A24<br>A26 A30                    | 0 | 14 | 14 |
| Objective test            | A1 A17 A20 A21 A24<br>A26 A30 B4 B6 B7 B8<br>B12 | 3 | 0  | 3  |
| 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 | Oral presentations to transfer knowledge and ease learning. Most of the graphical support of presentations is available in the virtual campus (Moodle).                                  |
| Laboratory practice            | For the students to learn effectively through the completion of practical activities in the field and/or in the laboratory.                                                              |
| Seminar                        | Demonstration and study of numerical models for a better understanding and resolution of ecological problems. Most models will be worked with Faculty PCs if students have no portables. |
| Multiple-choice questions      | Partial examination of the subject (mid-term) will take place during the course. They will not be eliminatory                                                                            |
| Case study                     | Deliverable elements of the activities carried out in Seminars and Practicals                                                                                                            |
| Objective test                 | Written exam on all aspects of the matter: theory, practicals and seminars.                                                                                                              |

| Personalized attention                                                                                                        |                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies                                                                                                                 | Description                                                                                                                                                                                                                                                             |
| Case study<br>Laboratory practice<br>Seminar<br>Guest lecture / keynote speech<br>Objective test<br>Multiple-choice questions | Elucidation of possible doubts emerging as the matter is developed.<br><br>Orientation and tuition to make the most of practicals.<br><br>Orientation and tuition to make the most of seminars.<br><br>Preparation, explanation and revision of deliverables and exams. |

| Assessment                |                                                  |                                                                                                                                         |               |
|---------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Methodologies             | Competencies                                     | Description                                                                                                                             | Qualification |
| Case study                | A1 A17 A20 A21 A24<br>A26 A30                    | Deliverable elements of the activities carried out in Seminars and Practicals (see assessment comments)                                 | 20            |
| Objective test            | A1 A17 A20 A21 A24<br>A26 A30 B4 B6 B7 B8<br>B12 | Written exam on all aspects of the matter: theory, practicals and seminars (see Assessment comments)                                    | 50            |
| Multiple-choice questions | A1 A17 A20 A21 A24<br>A26 A30                    | Partial examination of the subject (mid-term) will take place during the course. They will not be eliminatory (see assessment comments) | 30            |
| Others                    |                                                  |                                                                                                                                         |               |

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



The final grade will be a consequence of the global results obtained in all the evaluation activities, which will include the three parts of the subject: Theory, Seminars and Practicals, with a contribution to the final grade proportional to its contribution in time planning: 60% Theory, 20% Seminars and 20% Practicals. All students will have two opportunities to pass the course:

In the first opportunity, a continuous evaluation will be carried out, including deliverables (assignments), partial tests (mid-terms) and a final exam (on a date set by the Faculty Board), with the following weighting:

60% Theory (30% partial tests + 30% final exam)

20% Seminars (10% deliverables + 10% final exam)

20% Practicals (10% deliverables + 10% final exam)

In the case of the second opportunity, there will be a single final exam (on a date set by the Faculty Board) that will include questions on the three parts of the subject with the following weighting:

60% Theory

20% Seminars

20% Practicals

Both in the first and in the second opportunities it is necessary to pass each and every one of the three parts simultaneously (Theory, Seminars and Practicals) to pass the subject. A failed part may be compensated with others if its grade is at least 4/10. The average grade to pass the course must be a 5.0 out of 10. Those students who submit and/or attend any of the continuous assessment activities will be considered as presented (attended), receiving the corresponding grade for the work submitted and/or tests carried out according to their weighting, and a grade of zero in those works and/or tests in which they have not been presented (not attended). In case of not submitting assignments or not taking any of the tests, they will be considered as not presented.

Attendance at Seminars and Practices is not mandatory, but will be recorded.

The deliverable elements of Seminars and Practicals (assignments) will consist of a report of the activities carried out in Seminars and Practicals. Said reports will be made and delivered following the indications given by the professor (format, content, deadlines, etc.) and their qualification will be subject to individual oral examination, if necessary. These reports must be done individually and collect the work of each student as well as their personal interpretation. The reports of Seminars and Practicals will be corrected and returned to the students before the corresponding assessment tests and will be delivered, for deposit until the end (according to current regulations) of the following academic year, at the time of the final exam.

In accordance with current norms, in general the deliverables of Seminars and Practicals cannot be recovered until the end of the following academic year, so it is advisable to keep a copy of the material delivered.

The achievement of the Honours mark (maximum qualification) will require, at least, a final grade of 9.0 or higher, and the delivery of all the deliverables (assignments) of the course.

Students with officially recognized academic exemption are able to participate in the proposed or equivalent activities and have support by tutoring (onsite or online).



|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>         | <ul style="list-style-type: none"> <li>- Alstad DN (2001). Basic Populus models of ecology. New Jersey: Prentice-Hall</li> <li>- Alstad DN (). www.cbs.umn.edu/populus.</li> <li>- Begon M, Harper JL, Townsend CR (1999). Ecología: individuos, poblaciones y comunidades. Barcelona: Omega</li> <li>- Begon M, Howarth RW, Townsend CR (2014). Essentials of Ecology. USA: Wiley</li> <li>- Krebs CJ (1986). Ecología: el análisis experimental de la distribución y la abundancia. Madrid: Pirámide</li> <li>- Molles M (2006). Ecología: Conceptos y Aplicaciones. Madrid: McGraw - Hill</li> <li>- Piñol J, Martínez-Vilalta J (2006). Ecología con números. Barcelona: Lynx</li> <li>- Piñol J, Martínez-Vilalta J (). www.ecologiaconnumeros.uab.es.</li> <li>- Ricklefs RE (1998). Invitación a la ecología: la economía de la naturaleza. Madrid: Panamericana</li> <li>- Smith RL, Smith TM (2000). Ecología. Madrid: Pearson</li> <li>- Smith TM, Smith RL (2012). Elements of Ecology. USA: Pearson</li> <li>- Molles M (2013). Ecology: concepts and applications. McGraw Hill</li> </ul> <p>Unha das referencias básicas para os Seminarios é Piñol e Martínez-Vilalta (EC-650). Os modelos contidos no CD que inclúe o libro están tamén dispoñibles na súa web. Do enlace de Alstad pódese descargar libremente o programa Populus, con modelos de bioloxía xeral e para algúns seminarios en particular. Inclúe un PopulusHelp.PDF que foi editado como libro en 2001 (EC-505).</p> |
| <b>Complementary</b> | <ul style="list-style-type: none"> <li>- Gotelli NJ (1995). A primer of ecology. Sunderland: Sinauer</li> <li>- Margalef R (1974). Ecología. Barcelona: Omega</li> <li>- Odum EP, Barret GW (2006). Fundamentos de ecología. Mexico: Thomson</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Recommendations                                          |  |
|----------------------------------------------------------|--|
| Subjects that it is recommended to have taken before     |  |
| Chemistry/610G02001                                      |  |
| Mathematics/610G02003                                    |  |
| Statistics/610G02005                                     |  |
| Physical Geography/610G02006                             |  |
| Ecology I: Individuals and Ecosystems/610G02039          |  |
| Subjects that are recommended to be taken simultaneously |  |
| Population Genetics and Evolution/610G02021              |  |
| Animal Physiology II/610G02036                           |  |
| Subjects that continue the syllabus                      |  |
| Human Ecology/610G02041                                  |  |
| Ecotoxicology/610G02042                                  |  |
| Data Analysis in Biology/610G02044                       |  |
| Other comments                                           |  |
| Understanding                                            |  |
| rather than memorization is favored                      |  |

(\*)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.