

**COURSE DATA****Data Subject**

Code	33103
Name	Introduction to environmental sciences studies
Cycle	Grade
ECTS Credits	6.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
1104 - Degree in Environmental Sciences	Faculty of Biological Sciences	1	First term

Subject-matter

Degree	Subject-matter	Character
1104 - Degree in Environmental Sciences	165 - Incorporation to studies in environmental sciences	Obligatory

Coordination

Name	Department
NUÑEZ DE MURGA, JAVIER	23 - Functional Biology and Physical Anthropology

SUMMARY

The subject is aimed to development and achievement of certain transversal skills, such as the use of information and communication technologies, and the preparation, publication and presentation of scientific documents. In parallel with the development of these competences, English will be used as a fundamental language in science. It is also intended to provide students with basic knowledge in animal handling, legislation in experimentation, handling of instruments and safety in the laboratory. Finally, this basic training will be completed with notions of field research.

PREVIOUS KNOWLEDGE



Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

OUTCOMES

1104 - Degree in Environmental Sciences

- Conocimiento detallado del plan de estudios, su justificación, sus diferentes opciones, y la relación entre la formación que se va a recibir y las necesidades y exigencias del mercado laboral.
- Capacidad de diseñar el propio currículum formativo con vistas a la inserción profesional.
- Habilidad para identificar y localizar los distintos servicios y recursos humanos, administrativos e informáticos de la UVEG y utilizarlos en beneficio del rendimiento personal.
- Conocimiento de las normas básicas de seguridad en los laboratorios y en el campo.
- Capacidad de organizar y planificar el trabajo individual, grupal y el estudio.
- Capacidad de manejar el inglés para la lectura de documentos y elaboración de informes.
- Capacidad de comunicación oral en las exposiciones públicas y de argumentación de opiniones personales.
- Capacidad de manejo de las fuentes expertas en contenidos científicos.
- Capacidad de análisis crítico y síntesis.
- Compromiso ético en el manejo de animales para experimentación.
- Compromiso ético en el ejercicio de la profesión de ambientólogo.

LEARNING OUTCOMES

- Prepare synopsis and reviews from reading and comprehension of scientific texts.
- Being able of speaking before a public audience, such as the class itself, through exposure or intervention in a debate on a controversial topic or issue.
- Knowledge of basic methodology and apparatus in order to make and record diverse environmental parameters.
- Knowledge of basic methodology and apparatus in order to make and preserve biotic and abiotic samples.



- Ability to obtain scientific information in the field of environmental science and have criteria to assess their validity.
- Develop the capacity for critical thinking, encouraging communication and discussion of contents in order to stimulate individual creativity.
- Ability to work in groups when confronted to problematic situations collectively.
- Ability to argue from rational criteria, distinguishing clearly what is a mere opinion, from real facts or accepted scientific evidence.

DESCRIPTION OF CONTENTS

1. 1.- INFORMATION AND COMMUNICATION THEORIES (theory class)

1. QUALITY AND RELIABILITY OF INFORMATION.
 - 1.1. Sources of information in the classroom. Annotations
 - 1.2. The basic bibliography as a source of classroom information.
 - 1.3. Sources of information consulted on the Internet.
 - 1.4. The impact of information on the training of students: the use of scientific language.
2. SCIENTIFIC COMMUNICATION
 - 2.1. Publishers and Scientific Societies as journal publishers.
 - 2.2. Scientific knowledge requires publicity, dissemination and contrast.
 - 2.3. Many formal aspects determine the acceptance or rejection of the work.
 - 2.4. Tipus de documents en la comunicació científica.
 - 2.4.1. Primary Documents.
 - 2.4.2. Secondary documents.
 - 2.4.3. Reference literature.
3. THE JOURNAL ARTICLE
 - 3.1. Structure of the article: IMRAD/IMRAD format.
 - 3.2. Before starting: the choice of the journal
 - 3.3. Instructions to authors (authors guidelines)
 - 3.3.1. First page or title page.
 - 3.3.2. Introduction
 - 3.3.3. Materials and methods.
 - 3.3.4. Results.
 - 3.3.5. Discussion.
 - 3.3.6. Acknowledgements.
 - 3.3.7. Bibliography
 - 3.4. Editorial process for the revision of the article.
 - 3.5. Assessment of the quality of the journal: Impact Factor.



4. OTHER DOCUMENTS

- 4.1. Panels or posters.
- 4.2. Elaboration and written and oral presentation of seminars.
- 4.3. Reports and projects in biology.
- 4.4. Doctoral thesis
- 4.5. The curriculum
5. RELIABILITY OF INFORMATION AND SCIENTIFIC FRAUD.
- 5.1. The use we make of Internet information. Respect for authorship.
- 5.2. Reliabilitat i frau.
- 5.3. Predatory journals.

2. 2.- PRACTICAL SESSIONS IN COMPUTER ROOM

Search strategies. Management of bibliographic databases: MEDLINE and WEB of SCIENCE. Bibliographic Managers. Introduction to handling REFWORKS and MENDELEY. Preparation of scientific posters.

3. 3.- WORKOUT CLASSROOM

Reading, viewing, discussion and summary of spreading works.
Oral presentation from spreading works.
Practical exercises about scientific publications.

4. 4.- LABORATORY SAFETY AND INTRODUCTION TO ANIMAL EXPERIMENTATION

Lesson 1.- Safety in the laboratory. Good laboratory practices. Personal and work habits. Use of equipment and materials. Personal protection equipment. Handling of chemical products. Transferring. Labelling. Safety data sheets. Danger symbols. Biological agents. Radiation. Waste minimisation programme. What to do in case of emergency.

Lesson 2.- Handling of laboratory animals. Basic notions of animal handling: necessity of animal experimentation. Types of laboratory animals. Most commonly used species. General biological aspects. Pain and stress. Analgesia, anaesthesia and euthanasia. European Union legislation on animal protection. Legislation in force in Spain. Alternative methods to animal experimentation.

5. 5.- SECURITY AND FIELD RESEARCH (DATA COLLECTION AND ANALYSIS).

Lesson 1.- Behaviour and safety in the field. The field: particularities of the area of study and the objectives of the work. Legislation and regulations. Personal safety in the field. Behaviour. Basic equipment.

Lesson 2.- Use cartography and geographic positioning systems (GPS). Types of maps. Scales. Basic instruments. Orientation. Positioning. Determination of points of interest.

Lesson 3.- Recording and recording data and samples. Work before going out into the field. The field notebook. Basic concepts of data collection. Recording physical-chemical and biological parameters. Collection, labelling and conservation of biological samples.

**6. 6.- INTERDISCIPLINARY SEMINARS**

"Interdisciplinary Seminars" will be realized in groups (3 / 4 students), with the subject Biology. Teachers of the Biology Subject will tutor and evaluate the contents, while teachers of the "incorporacion" subject will handle the format of the presentations. Each student will elaborate and present a single work for both subjects and the obtained mark will be considered in the two subjects. The instructions for this activity and the delivery of documents by students will be made through Aula Virtual.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Computer classroom practice	12,00	100
Laboratory practices	10,00	100
Classroom practices	6,00	100
Tutorials	2,00	100
Attendance at events and external activities	3,00	0
Development of group work	22,00	0
Preparation of evaluation activities	21,00	0
Preparing lectures	26,00	0
Preparation of practical classes and problem	18,00	0
TOTAL	150,00	

TEACHING METHODOLOGY**PART 1.- INFORMATION AND COMMUNICATION TECHNOLOGIES (TICs)**

This part is structured in classroom activities (theoretical classroom sessions, computer classroom practices and problem sessions) and in non-classroom activities of students' autonomous work.

- *Theoretical sessions in the classroom.* They will be developed during 9 sessions of 1 hour, which will be taught sequentially, in such a way that they are integrated with the rest of the proposed activities.

- *Practical sessions in a computer classroom.* 6 sessions will be carried out (16 hours in total in a computer classroom).



- Practice 1 and 2.- Introduction of basic concepts necessary to elaborate research strategies. Afterwards, and in a completely practical way, students will be trained in the basic handling of two important databases: MEDLINE and Web of Science. As a result of the practical, students will obtain certificates that they will keep for subsequent processing.
- Practical 3 and 4. Bibliographic managers: MENDELEY and REFWORKS. This program allows for the online storage of bibliographic references and their subsequent processing for use in publications. The basic handling of the different options offered will be introduced, with the main emphasis on importing results from databases such as those used in the first session.
- Practical 5 and 6. These sessions will be devoted to the elaboration of a scientific poster. Students will be able to use both open-access tools and programmes such as Power Point.

- *Exercises in classroom sessions.* They will be conducted in classroom sessions of 1 hour. The aim of these sessions is the approach of various activities, working on different aspects needed to present scientific results in various formats.

- Session 1 and 2 .- Reading, viewing, discussion and summary of disclosure documents. In this activity groups will be made and they will be provided with specific documentation on a topic. Students must read, understand and interpret these records and use teamwork in order to get to a script or outline of what was read. Then each student individually will prepare with their own words an abstract (maximum one page).
- Session 3 and 4 .- Discussion and oral presentation. Documentation of the first 2 sessions will be used, obtained from sources of varying quality and reliability, to prepare an oral group of presentation. A representative of each group will hold a presentation for about 10 minutes, defending their points of view. This activity will be used to show in practice the different aspects that may influence the effectiveness of an oral presentation.
- Session 5 and 6 .- Practical exercises publications. Exercises will arise in which, from a document and / or experimental data, students will elaborate different parts of a job. These exercises can also be used for students to deepen their knowledge of English.

PART 2. LABORATORY SAFETY AND INTRODUCTION TO ANIMAL EXPERIMENTATION

Safety in the laboratory session (1 hour). This session will introduce students to basic concepts of good practice in a research laboratory.



Introduction to animal experimentation (2 hours). The aim is to introduce students to the basic theoretical notions of both the handling of laboratory animals and national and international legislation on animal experimentation.

PART 3 .- BEHAVIOR AND SAFETY IN THE LABORATORY AND FIELD.

- Theoretical sessions in the classroom. They will be conducted in 9 sessions of 1 hour.
- Sessions of data collection and analysis.

DATA COLLECTION:

Field trips (6 hours):

Basic material of orientation and registration of environmental data. Taking and preservation of samples.

The field trip will be made to an area with terrestrial and aquatic environments, preferably an area or environment with unique species of special interest.

DATA ANALYSIS:

Laboratory practice (4 hours)

Associated with the field trip, two lab practices will be carried out with the following objectives:

- Knowledge and use of the basic work material in the laboratory.
- Processing of biological samples.



Practice in Computer Room (2 hours).

Design of data collection. Knowledge and use of various computer applications to organize data obtained in the field.

EVALUATION

We propose the following distribution of a maximum of 100 points (50 POINTS WILL HAVE TO BE REACHED TO PASS THE COURSE):

- **ASSESSMENT QUESTIONNAIRES IN VIRTUAL CLASSROOM (50 points)**

Questionnaires will be carried out in the computer room through the Virtual Classroom where test questions will be collected from all parts of the course. It is a necessary condition to make the test properly in order to pass the subject. It will be possible to compensate the marks obtained in the activities if from 20 points. The score in this block will be kept for a full academic year.

- **EVALUATION OF THE ACTIVITIES (up to 50 points)**

This section will assess the activities undertaken by students either in attendance or no attendance. In case of failing the subject in the first round, the activities of this section (as a whole, not separately) will be maintained for a full academic year.

All these activities should be realized during the academic year, between September and May/June. If they are not done in this period it will not be possible to pass the course.

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| * Development work | 15 points |
| * Literature search | 5 points |
| * Interdisciplinary Seminars | 10 points |



* Attendance and use the data collection and analysis **10 points**

* Attendance and activities, papers, presentations... **10 points**

TOTAL 50 points

The evaluation of the field and laboratory practices will be carried out through the field notebook that must be done personally by the student, then scanned and delivered in PDF format through the virtual classroom in a task to reduce as much as possible the risks inherent in paper handling.

To apply for the advancement of the exam of this subject, students should be aware that the mandatory activities outlined in this guide have to be accomplished.

REFERENCES

Basic

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