COURSE PROGRAM

Academic Year: 2024/2025

Identification and characteristics of the course				
Code	502752		ECTS Credits	6
Course name (English)	Processes of communication and scientific documentation			
Course name (Spanish)	Procesos de Comunicación y Documentación Científica			
Degree programs	Biochemistry Degree			
Faculty/School	Faculty of Veterinary Medicine			
Semester	6º	Type of course	Optative	
Module	Optativity			
Matter	Processes of communication and scientific documentation			
Lecturer/s				
Name		Office	E-mail	Web page
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Subject Area	Physiology			
Department	Physiology			
Coordinating Lecturer	José Antonio Tapia García			

Competencies*

Basic competencies

BC1 - Students should be able to show that they know and understand facts and contents in a field of study which, based on a previous general secondary school level, have been extended to those included in advanced textbooks and, in some aspects, come from the front line of their field of study.

BC2 - Students can apply their knowledge to their work or vocation in a professional manner and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

BC3 - Students to have the capacity to collect and understand data to express thoughts about social, scientific and ethical topics.

BC4 - Students to be able to transmit information, ideas, problems and solutions to an specialized and non-specialized audience.

BC5 - Students have developed those skills needed to undertake further studies with a high degree of autonomy.

* The sections concerning competencies, course outline, educational activities, teaching methodologies, learning outcomes and assessment systems must conform to that included in the ANECA verified document of the degree program.

General competencies
GC1 - Know how to identify the organization and function of biological systems at the cellular and molecular levels, being able to discern the different molecular mechanisms and the chemical transformations responsible for a biological process
GC2 - Know how to apply the knowledge of Biochemistry and Molecular Biology to the professional practice and to possess the intellectual skills and abilities necessary for such practice, including the ability to: management of information, analysis and synthesis, problem solving, organization and planning and the generation of new ideas.
GC3 – To be able of gather and interpret relevant data, information, and results, to obtain conclusions and to generate reasoned reports on relevant social, scientific or ethical issues in connection with advances in Biochemistry and Molecular Biology.
GC4 - Knowing how to transmit information, ideas, problems and solutions in the field of Biochemistry and Molecular Biology to both specialized and non-specialized audiences.
GC5 – To develop those learning strategies and skills necessary to undertake further studies in the Biochemistry and Molecular Biology area and other related areas with a high degree of autonomy.
GC6 – To acquire skills in the management of computer programs including access to bibliographic, structural, or kind of other useful databases in Biochemistry and Molecular Biology.
Transversal competencies
TC1 – To have an ethical commitment and concern for professional deontology.
TC2 – Acquire expertise in the use of basic computer tools for communication, search of relevant information, and data processing in their professional activity.
TC3 – To have the capacity for analysis, synthesis and critical reasoning in the application of the scientific method.
TC4 – To have the ability to learn and work autonomously (ability to analyze, synthesize, global views and apply knowledge to practice/ability to make decisions and adapt to new situations)
TC5 – To have communication skills (ability to understand and express oneself orally and in writing, controlling specialized language).
TC6 – Creative and entrepreneurial ability (ability to formulate, design and manage projects / ability to seek and integrate new knowledge and attitudes).
TC7 – To have the ability to integrate in a work team (ability to collaborate with others and contribute to a common project / ability to collaborate in interdisciplinary teams and in multicultural teams).
TC9 – To be able to use English as a vehicle for scientific communication.
Specific competencies
SC12 – To know the major contemporary problems and future challenges of Biosciences, as well as the ethical and social implications of the practical applications of Biosciences in the health and biotechnology sectors.
SC18 – To possess the mathematical, statistical and computer skills to obtain, analyze and interpret data, and to understand simple models of biological systems and processes at the cellular and molecular level.

SC19 - Know how to search, obtain, analyze and interpret information from the main biological and bibliographic databases using bioinformatics tools.
SC20 – To acquire the ability to transmit information within the area of biosciences, including mastery of specific terminology.
SC24 – To acquire knowledge of the analytical, experimental and computer techniques commonly used in biosciences and know how to interpret the information they provide.
Contents
Course outline*
Introduction to the processes of scientific communication. Sources of scientific information, search, and recovery. Scientific information and communication technologies (ICTs). Indicators for scientific quality and production. The scientific-technological systems in Extremadura, Spanish and European. Notions of project presentation and management.
Course syllabus
Name of lesson 1. Epistemology of Science. **Contents of lesson 1.** Generation and validation of scientific knowledge. The scientific method. **SC12**
Name of lesson 2. Scientific-technological systems: Extremadura, Spain, Europe. **Contents of lesson 2**. The public scientific system and the research career. Management and application for scholarships/contracts in competitive calls. Curriculum vitae management in standardized models. **SC12.** **Description of the practical activities of lesson 2:** Guidelines for filling-up the curriculum in standard formats. Application management of grants and projects.
Name of lesson 3. Scientific communication processes. **Contents of lesson 3**. Scientific communication as an essential part of all stages of research. Editing and revision process of a scientific publication. Types of scientific publications. Structure of a scientific publication. Ethics in scientific communication. **SC18, SC20, SC24.**
Name of lesson 4. Sources of scientific information. **Contents of lesson 4**. Scientific documentation and clinical documentation. Typological classification of scientific information. Primary and secondary information sources. Scientific literature databases. **SC18**, **SC19, SC20, SC24.** **Description of the practical activities of lesson 4:** basic search for information in Pubmed, Scopus, Web of Science (WoS) and Europe PMC.
Name of lesson 5. Scientific Information and Communication Technologies I. **Contents of lesson 5**. Bibliographic search strategy: language control and setting limits. Information search on the Web 2.0. **SC18**, **SC19.** **Description of the practical activities of lesson 5:** advanced search for information in Pubmed, Scopus, Web of Science (WoS) and Europe PMC.
Name of lesson 6. Scientific Information and Communication Technologies II. **Contents of lesson 6**. Reference management software. **SC18**, **SC19, SC20, SC24** **Description of the practical activities of lesson 6:** Using reference management software: creating a database, reference citation and style in documents. The use of bibliography software in real practical cases (final degree project)

Name of lesson 7. Quality indicators and scientific production I.

Contents of lesson 7. Types of evaluable documents and what is measured. The citation as an indicator of quality. Quality indexes related to journals: impact factor and its limitations. **SC18, SC19, SC24.**

Description of the practical activities of lesson 7: Search for quality indexes of journals.

Name of lesson 8. Quality indicators and scientific production II.

Contents of lesson 8. Researcher-related quality indices: the H-index or Hirsch index and its limitations. Publons, google scholars citation and researchgate. Other evaluation procedures: webmetrics and altmetrics. **SC18, SC19, SC24.**

Description of the practical activities of lesson 8: Search for quality indexes of researchers. Search for quality indexes of Institutions and research trends.

Practical activities

There will be **3 seminars** of 2h30min duration plus **10 practices** divided into 12 sessions of approximately 2h40min - 2h45min, all of them related to the content of the theoretical program of the subject, which, among others, will include the application of the theoretical content to real situations of search, organization and processing of scientific information retrieved from databases, preparing the student to use these knowledge in the development of their own final degree project, thesis, etc.

Practices

Practice 1. Guidelines for filling-up the curriculum in standard formats.

Practice 2. Application management of grants and projects.

Practice 3. Preliminary database management: basic search of information in Pubmed, Scopus, Web of Science (WoS) and Europe PMC.

Practice 4. Advanced database management: automatic search of information in Pubmed, Scopus, Web of Science (WoS) and Europe PMC (2 sessions).

Practice 5. Use of bibliography software: database creation.

Practice 6. Use of bibliography software: citation and style in documents (2 sessions).

Practice 7. Search for quality indexes of journals.

Practice 8. Search for quality indexes of researchers.

Practice 9. Search for quality indexes of Institutions and research trends.

Practice 10. Use of bibliography software: database management in real practical cases (final degree project).

Seminaries

Seminar 1. Registration and access to information sites I.

Seminar 2. Registration and access to information sites II.

Seminar 3. Orientations on the work of the matter.

All practices and seminars will be completed face-to-face according to the methodology described in the **Teaching Methodologies** section, except for exceptional situations that do not allow attendance at the center. In this case will be enabled procedures to develop the practical content in a non-face-to-face way.

Depending on the number of students enrolled, it may be necessary to create several groups of practices. In such case the students will be conveniently informed of the procedure for incorporating into specific groups of practices through the Virtual Campus.

Educational activities*

Student workload in hours by lesson		Lectures	Practical activities				Monitoring activity	Homework
Lesson	**Total**	**L**	**HI**	**LAB**	**COM**	**SEM**	**SGT**	**PS**
1	5.0	1			0			4
2	9.0	1			2.5	2.5		3
3	11.5	2			0	2.5		7
4	15.0	2			5.0			8
5	21.5	3			7.5			11
6	30.5	3			7.5			20
7	28.0	3			5.0			20
8	27.5	3			5.0	2.5		17
Assessment **	2.0	2			0			0
TOTAL	150	20			32,5	7,5		90

L: Lectures (85 students)
HI: Hospital internships (7 students)
LAB: Laboratory or field practices (15 students)
COM: Computer room or language laboratory practices (20 students)
SEM: Problem classes or seminars or case studies (40 students)
SGT: Scheduled group tutorials (educational monitoring, ECTS type tutorials)
PS: Personal study, individual or group work and reading of bibliography.

Teaching Methodologies *

Lectures. Methodology: Expository and participatory classes in large groups using audiovisual media (presentation with a video cannon, interactive visual software, specific and generic software, electronic whiteboard and videos).

Seminar/laboratory activities. Methodology: Practices in the computer room. Search work will be carried out in international databases.

Homework. Methodology: Individualized study of the contents explained, and the material provided by the teacher. Analysis of scientific publications. Preparation of an objective test and a practice.

** Indicate the total number of evaluation hours of this subject.

The teaching methodology used for each training activity and its time distribution appear in the following table:

Training activities and methodologies				
Training activities [1]	ECTS	Hours	Percentage of face-to-face	methodologies [2]
1	0,8	20	13,3%	1
3	1,3	32,5	21,7%	2
4	0,3	7,5	5,0%	2
6	3,6	90	0,0%	4

[1] Training activities: 1. Lectures and participatory classes. 3. Computer practices. 4. Seminars and resolution of practical cases. 6. Homework.

[2] Teaching methodology: 1. Participatory exhibition. Master classes on a blackboard and / or with the support of audiovisual media in a large group. 2. Participatory exhibition. Practical work in laboratories, computer rooms or other facilities in small groups. 4. Non-face-to-face learning activity through study of the subject, the analysis of documents, the preparation of reports… In exceptional situations, which do not allow face-to-face teaching in the center, methodologies for remote teaching will be deployed, if available.

Learning outcomes*

This section aims to define some statements of what the student is expected to know, understand and be able to do at the end of a learning period.

Upon completion of the course, students are expected to be able to:

1. To obtain an updated vision of the Institutions that rule science and scientific knowledge in the European, Spanish and regional context.
2. To become familiar with the requirements and procedures of different programs to apply to and manage research projects and contracts, as well as grants, contracts, and other sources of personal or institutional funding.
3. Search, select, classify, and organize documentation and scientific information from specialized databases.
4. To identify the methods of citing.
5. To understand the process of organizing, writing and publishing an article or research report.
6. To familiarize with the indicators related to the scientific quality of researchers and the journals in which they publish.
7. To achieve skills in the interrogation and use of specialized databases.
8. Use the skills and competencies mentioned above in the writing of scientific-technical papers and reports of any kind (research manuscripts, practical assignments, etc…). The student will obtain the ability to collect, interpret and write scientific-technical documents with different degree of specialization.

Assessment systems *

To complete the evaluation will be applied the *Normativa de Evaluación de las Titulaciones oficiales de Grado y Máster de la Universidad de Extremadura* (DOE number 212, published on November 3, 2020)

For the evaluation of the competences a **continuous evaluation system** will be used, which will consider the attendance and participation in lessons and seminars, the preparation of course works, and the final exam. In this sense, we will use the following evaluation instruments to obtain the final qualification, whose maximum benchmark appears in **bold**:

A. Attendance and active participation, both in person and online, in classes of problems / practical cases. Attendance, both face-to-face and synchronous remote teaching, to lessons, practices and seminars will be controlled, representing up to **10%** of the final grade (**1.0 point**). This activity is non-recoverable.

B. Course works:

   B.1. During most of the practical sessions, a questionnaire will be prepared with results obtained during the different sessions. These activities may jointly represent up to **20%** of the final grade (**2.0 points**) This activity is non-recoverable.

   B.2 In addition, the student must prepare, in article format and Spanish or English language, a review of any research topic or about the scientific production of a researcher or institution and perform a critical analysis of the obtained results representing up to **30%** of the final grade (**3.0 points**). This activity must be original and must be done individually. This activity is recoverable.

C. Final exam: will be written and will consist of 20 multiple choice questions and a 5-question practical exam that must be completed by using a computer and will represent up to **40%** of the final qualification (**4 points**). Whenever possible, this final exam will be completed face-to-face in the computer room. In situations not allowing to assist to such facility the exam will be completed by means of the virtual campus or equivalent remote tools. This activity is recoverable.

The grade will therefore be calculated according to the following equation:

$$\text{Final grade} = (0.10 \times A) + (0.20 \times B1) + (0.30 \times B2) + (0.40 \times C)$$

Alternatively, the student will be able to take a **global final test** to pass the matter. The choice of the global assessment modality corresponds to the student, who must indicate during the first quarter of the semester his/her intention to follow this evaluation system. To do this, he/she must use a specific tool created for this purpose on the Virtual Campus. The practice and theory of the matter will be evaluated in this global final test, although a different ponderation that above will be applied. In this case the theory content will be 40% of the grade and the practice evaluation the remaining 60%. In the absence of an express request of the global final test, the default assessment systems will be the continuous evaluation system.

Bibliography (basic and complementary)

Basic bibliography

1. Bertrand Russell. La perspectiva científica. Planeta DeAgostini, Barcelona. ISBN: 843950232X.
2. Mario Bunge. La investigacion cientifica: su estrategia y su filosofía. Serie *Methods*. Ariel, Barcelona. ISBN: 8434480107.
3. Fidias G. Arias Odon. El Proyecto de Investigación: Guía para su elaboración (3ª ed.). Eepisteme C.A. - Orial Ediciones, Caracas. ISBN: 9800738681. Recurso electrónico [Consulta: 6 de mayo de 2019]
4. Antonio Carreras Panchón (Coordinador). Guía práctica para la elaboración de un trabajo científico. Cita Publicaciones y Documentación, Valencia. ISBN: 8460501728.
5. José Mª Seguí Simarro, José Luis Poza Luján y José Miguel Mulet Salort. Estrategias de divulgación científica. Academica de la UPV, Valencia. ISBN13: 9788490483190.
6. Falagas ME, Pitsouni EI, Malietzis GA, Pappas G (2008). Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. *FASEB J* 22(2):338-342.
7. Adie E, William R (2013). Altmetric: enriching scholarly content with article-level discussion and metrics. *Learned Publishing* 26(1):11-17.

Complementary bibliography

1. Gérard Fourez. La construcción del conocimiento científico: filosofía y ética de la ciencia. Narcea, S.A. de Ediciones, Madrid. ISBN: 8427710623.
2. Nicholas Rescher. Los límites de la ciencia. Tecnos, filosofía y ensayos, Madrid. ISBN: 8430924442.
3. Marcos Méndez Iglesias. Como escribir artículos científicos. Tundra Ediciones, Castellón. ISBN13: 9788493787349.
4. Rosa Sos Peña. Técnicas de documentación científica: teoría y práctica. Promolibro, Valencia. ISBN13: 9788479861230.
5. Restituto Sierra bravo. Tesis doctorales y trabajos de investigación científica. (3ª ed. Rev. y ampl.) Madrid: Ediciones Paraninfo, Madrid. ISBN13: 9788497321389.
6. Alonso Rodríguez Navarro y Juan Imperial Ródenas. Índice h. Guía para la evaluación de la investigación española en Ciencia y Tecnología utilizando el índice h. Dirección General de Universidades e Investigación de la Comunidad de Madrid. Electronic resource
7. Hassan S-U, Gillani UA (2016). Altmetrics of "altmetrics" using Google Scholar, Twitter, Mendeley, Facebook, Google-plus, CiteULike, Blogs and Wiki. *Social and Information Networks (cs.SI)* Electronic resource

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Other resources and complementary educational materials

Campus virtual de la UEx
http://campusvirtual.unex.es/portal/

Recursos Científicos de la Federación Española para la Ciencia y la Tecnología (FECYT)
https://www.recursoscientificos.fecyt.es/

Diario oficial de Extremadura
http://doe.juntaex.es/

Boletín Oficial del Estado
http://www.boe.es/

Servicio de información para la comunidad de investigación y desarrollo (CORDIS)
http://cordis.europa.eu/home_es.html

Recursos del National Center for Biotechnology Information (NCBI)
http://www.ncbi.nlm.nih.gov/

Recursos del Europe PMC
https://europepmc.org/

Repositorio de la Fundación Dialnet
http://dialnet.unirioja.es/

Biblioteca Electrónica de la Universidad de Extremadura
http://biblioguias.unex.es/az.php

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