VNIVERSITAT DE VALÈNCIA

Course Guide
33187 History and social aspects of molecular biosciencies

COURSE DATA

DATA SUBJECT

Code: 33187
Name: History and social aspects of molecular biosciencies
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1111 - Grado en Biotecnología	Facultat de Ciències Biològiques	1	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1111 - Grado en Biotecnología	History and social aspects of molecular biosciencies	BASIC

COORDINATION

FERRAGUD DOMINGO CARMEL

SUMMARY

The course "Historic and social aspects of molecular biosciences" is intended to provide students with information and a critical attitude towards scientific knowledge in its relationship with society and culture. It discusses the origins and evolution of biological sciences and more specifically of molecular biosciences. It provides the conceptual tools to analyze and understand the meaning of biomolecular technoscience in contemporary society and stimulates a critical analysis of current trends in life sciences, their social implications, their link to social policies and to moral conflicts. With this perspective, students will analyze an update of: knowledge production systems; scientific practices; factors for the development of biological knowledge; the main elements of the practical and conceptual revolution caused by the molecular sciences in the twentieth century; and the new social role of scientists in the 21st century.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

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Actuar con autonomía en el aprendizaje, tomando decisiones fundamentadas en diferentes contextos, emitiendo juicios en base a la experimentación y el análisis y transfiriendo el conocimiento a nuevas situaciones

Apply and understand knowledge in biotechnology and use that knowledge in professional contexts.

Assimilate ethical and legal principles in scientific research in biotechnology.

Colaborar eficazmente en equipos de trabajo, asumiendo responsabilidades y funciones de liderazgo y contribuyendo a la mejora y desarrollo colectivo

Communicate ideas, problems and solutions within the field of biotechnology.

Conocer los elementos fundamentales de la comunicación y percepción pública de las innovaciones biotecnológicas y de los riesgos asociados a ellas

Conocer y comprender, desde el propio ámbito de la titulación, las desigualdades por razón de sexo y género en la sociedad; integrar las diferentes necesidades y preferencias por razón de sexo y de género en el diseño de soluciones y resolución de problemas

Contribuir en el diseño, desarrollo y ejecución de soluciones que den respuesta a demandas sociales, teniendo en cuenta como referente los Objetivos de Desarrollo Sostenible

Demostrar razonamiento crítico y autocrítico en el ámbito de la titulación, considerando aspectos tales como la ética profesional, los valores morales y las implicaciones sociales de las diferentes actividades realizadas

Design prospective market research for a biotechnological product.

Disseminate and engage in public debate on issues related to biotechnology and its applications.

Participate in multidisciplinary teams, engaging in teamwork and collaboration.

Poder realizar un estudio empírico y/o experimental para determinar las variables claves que determinan el conocimiento de los agentes en el mercado

Propose creative and innovative solutions to complex situations or problems, typical of the area of ¿¿¿¿connection, to donate responses to the various professional and social needs

Que el estudiantado sea capaz de identificar el tipo de responsabilidad legal derivada de la actividad investigadora y la explotación de sus resultados

Saber comunicarse de manera efectiva, tanto de forma oral como escrita, adaptándose a las características de la situación y de la audiencia

Search for and retrieve information from major patent databases and prepare the documentation required

for patent applications of biotechnological products.

Ser capaz de analizar y asimilar de manera crítica la información científica y de entender la dimensión histórica del conocimiento científico

Tener una visión integrada del proceso I+D+i desde el descubrimiento de nuevos conocimientos básicos hasta el desarrollo de aplicaciones concretas de dicho conocimiento y de la introducción en el mercado de nuevos productos biotecnológicos

Understand and apply the criteria for evaluating biotechnological risks.

Use English to write reports and to interpret information from protocols, manuals and databases.

DESCRIPTION OF CONTENTS

1. Theoretical lessons

1. Science in Ancient History (from Ancient Greece to medieval Europe).

2. The main stages of evolution of early modern science.
Elements for the transition to modernity. The "scientific revolution" in biology (gender, power, sites). Universities and scientific academies.

3. The development of experimental biology.
Origins of contemporary biomedical science (19th century). Morphological sciences and the cell theory. Embryology, bacteriology and physiological sciences. The new experimental biology and its controversies (animal experimentation, scientific instruments, etc.). The birth of the evolutionary paradigm. Social Darwinism.

4. The molecularization of biology.
Origins of Mendelian genetics and biochemistry. Eugenics. The emergence of molecular biology (20th century). From the protein to DNA. The structure of DNA and the central dogma of molecular biology.

5. The birth of genetic engineering and the new biotechnologies (main lines of development). Protein and DNA sequencing. The Human Genome Project. The regulation of genetic engineering. Intellectual property in the biosciences. The ethical, economic and social dimensions of the new biotechnologies.

1. Thematic practical sessions.
Students will analyze science communication in academic and in popular science journals.

2. Reading and review of a book included among the bibliography proposed by the professor.

3. Trips.
There will be two guided tours in exhibitions or museums dealing with topics related to the course and student will carry out specific activities in order to analyze the role of museography and museology in the

2. Practical activities

1. Thematic practical sessions.
Students will analyze science communication in academic and in popular science journals.

2. Reading and review of a book included among the bibliography proposed by the professor.popularization of scientific knowledge

4. Seminars.
Addressing the social and ethical implications of molecular biosciences through the discussion of a range of themes proposed by the professor.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	33,00
Computer classroom practice	2,00
Classroom practices	25,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	30,00
Independent study and work	35,00
Preparation of lessons	25,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

The work and learning process will integrate various complementary activities:

1. Lectures in the classroom: will consist of two sessions per week in which the teacher will present and discuss the main issues of the program (see the section on theory contents).

2. Seminars and practical work in the classroom: will consist of a weekly session in which students work with a variety of sources: scientific texts, databases, popular science texts, films or newspaper articles.

3. Reading and critical commentary on a book selected from the literature given by the teacher.

4. Trips. There will be two guided tours in exhibitions or museums dealing with topics related to the course and student will carry out specific activities in order to analyze the role of museography and museology in the popularization of scientific knowledge.

5. Oral communications by groups. The groups of students will present a work analyzing the social and ethical implications of molecular biosciences and this presentations will serve as a starting point for the discussion in the classroom.

6. Tutorials. Tutoring sessions will be optional. Students have three hours per week of free consultation with the teacher in relation to academic work being carried out.

EVALUATION

Theoretical examination of the contents of the course syllabus: up to 6 points (to pass the course students must obtain at least 40%). The exam will include questions dealing with the historical contextualization and the critical analysis of the main issues addressed in the course.

Practical work in the classroom: up to 2 points (in order to be evaluated, all of them must be submitted).

Reading and critical analysis of a book: up to 1 point

Work on the exhibitions and museums: up to 1 point.

(For the evaluation of the practical sessions the professor will take into account the attendance, participation and attitude in the classroom as well as the communication abilities and the mastery of contents).

REFERENCES

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