# COURSE DATA

## DATA SUBJECT

**Code:** 44701
**Name:** Case studies in biomedicine and biotechnology
**Cycle:** Master's Degree
**ECTS Credits:** 3
**Academic year:** 2025-26

## STUDY (S)

| Degree | Center | Acad. year | Period |
|---|---|---|---|
| 2224 - Master's Degree in Research and Development in Biotechnology and Biomedicin | Facultat de Ciències Biològiques | 1 | First quarter |

## SUBJECT-MATTER

| Degree | Subject-matter | Character |
|---|---|---|
| 2224 - Master's Degree in Research and Development in Biotechnology and Biomedicin | Research and development in biomedicine | COMPULSORY |

## COORDINATION

ANIENTO COMPANY FERNANDO

GOMEZ MINGUET EUGENIO

# SUMMARY

This subject is integrated, along with the subjects of "Current problems in biomedicine" and "Biomedicine and society" in the subject called "R & D in biomedicine". This course will expose students to real situations of professional activity in the field of biomedicine and biotechnology to teach them the strategies adopted to solve problems and to identify specific caveats and solutions of these strategies. What is sought is that students understand some of the conceptual and technical paths that professionals in these fields undertake when addressing specific problems and seek solutions for them. Teaching will include seminars given by specialists who will explain the biomedical or biotecnnological problem from their research or professional experience and discussion sessions on the presented topics.

# 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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Access the necessary information within the specific subject area (databases, scientific articles, etc.) and have sufficient judgement to interpret and apply it.

Adquirir destrezas en el manejo de las metodologías avanzadas empleadas en las biociencias moleculares y en el registro anotado de actividades.

Apply critical reasoning and argumentation based on rational criteria.

Apply ethical and legal principles of scientific research in biotechnology and biomedicine.

Apply research experience acquired both in private companies and public organisations.

Apply science from a social and economic perspective, promoting the transfer of knowledge to society.

Apply the knowledge acquired to identify career opportunities and sources of employment.

Aprendizaje en la redacción de artículos científicos en los campos de la Biomedicina y la Biotecnología.

Be able to integrate new technologies in their professional and/or research work.

Conocer las aplicaciones de los nuevos conocimientos emergentes en el diagnóstico, prevención y tratamiento de las enfermedades humanas.

Consider entrepreneurship as a professional alternative.

Critically analyse one's own work and that of colleagues.

Deepen understanding of the role of biotechnology and biomedicine professionals within the scientific and social context and their contribution to the economic model.

Demonstrate motivation for quality and continuous improvement, acting with rigour, responsibility and professional ethics.

Demonstrate respect for fundamental rights and equality between men and women.

Design multidisciplinary experimental strategies in the field of molecular biosciences to solve complex biological problems, especially those related to human health.

Develop scientific results obtained by oneself or other scientists into practical applications with social and/or economic profitability.

Gain personal skills that facilitate professional integration and development.

Handle scientific information sources appropriately and assess them critically, integrating the information to contribute knowledge to multidisciplinary research teams.

Know and apply risk assessment criteria in biotechnology and biomedicine.

Know and use job search techniques and tools.

Make proper use of IT tools, statistical and data simulation methods, applying IT tools and statistics to biomedical and biotechnological problems.

Make rapid and effective decisions in complex situations within one's professional or research activity by developing new and innovative working methodologies adapted to the scientific/research, technological or professional field in which the activity takes place.

Master the scientific method, the design of experimental protocols and the interpretation of results in the biomedical and biotechnological fields.

Mejorar la capacidad de trabajar con seres vivos o muestras biológicas.

Prepare, write and present reports and projects in public in a clear and coherent manner, defend them with rigour and tolerance and respond satisfactorily to any criticism that may arise from the presentation.

Project the knowledge, skills and competencies acquired to promote a society based on the values of freedom, justice, equality and pluralism.

Select and manage available resources (instrumental and human) to optimise research outcomes.

Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.

Students should demonstrate self-directed learning skills for continued academic growth.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

Understand the key elements of communication and public perception of biotechnological and biomedical innovations and the risks associated with them.

Use inclusive and non-discriminatory language in all the above-mentioned areas of communication.

Work in a team, without discriminating between men and women, carry out professional or research work efficiently and acquire the ability to participate in research projects and scientific or technological collaborations.

# DESCRIPTION OF CONTENTS

## 1. Case study panel

They will present strategies (conceptual and methodological) for solving specific problems in the development of professional and research activity in different areas of biomedicine and biotechnology. The aspects that will be considered in this subject include topics such as those detailed below. Scientific method and translational research in biomedicine: journey from basic research to potential clinical application. Basic biomedical and biotechnological research to support transfer developments. From the clinic to the laboratory: identification and structuring of hypotheses derived from clinical practice that can be analyzed in the field of basic research in molecular biosciences. Clinical trials: phases, design, problems, regulations and decision making in the different phases of preclinical development. Regulation of hematopoiesis under conditions of homeostasis and its alteration during an infection. C. elegans as a tool for biomedical research. Tissue engineering for the development of biomaterials with applications in regenerative medicine. Application of nanotechnology to the resolution of biomedical problems. Biotechnological applications of the study of the biology of pathogens: case of Vibrio vulnificus. Plant biotechnology: strategies and applications. Problems and biorational design of insect-resistant plants. Basic research on protein structure and function, including their synthesis, folding, insertion into biological membranes and intracellular trafficking: possible biomedical and biotechnological applications.

# WORKLOAD

## PRESENCIAL ACTIVITIES

| Activity | Hours |
|---|---|
| Theory | 30,00 |
| **Total hours** | **30,00** |

## NON PRESENCIAL ACTIVITIES

| Activity | Hours |
|---|---|
| Attendance at other activities | 0,00 |
| Individual or group project | 20,00 |
| Independent study and work | 30,00 |
| Preparation of lessons | 0,00 |
| Preparation for assessment activities | 0,00 |
| Resolution of case studies | 0,00 |
| **Total hours** | **50,00** |

# TEACHING METHODOLOGY

**Seminars (30 h)**. Taught by specialists who develop their activity in different basic and hospital research centers. They will be held in 2-hour sessions and will present strategies for the resolution of specific problems in the development of professional and research activity in different fields of biomedicine and biotechnology

**Individual work (20 h)**. It will consist in the elaboration of a written work developing basic questions related to some of the cases raised in the seminars.

## EVALUATION

The evaluation of the course will be done through a series of questionnaires in which the basic knowledge acquired in the different cases raised in the seminars will be assessed (80% of the score). 20% of the score will result from the assessment of the individual work. To pass the course, at least half of the score in each of the sections and attendance at 80% of the seminars will be necessary.

## REFERENCES


- PubMed database. U.S. National Libary of Medicine and the National Institutes of Health http: //www.pubmed.com
- Cochrane Library. Biblioteca Cochrane Plus http://www.cochrane.org
- EMEA. Agencia europea del Medicamento http://www.emea.eu.int/
- Agencia Española del Medicamento http://www.agemed.es
- OMS. Organización Mundial de la Salud http://www.who.int/en/
- ONT. Organización Nacional de Transplantes http://www.ont.es/Paginas/Home.aspx