



COURSE DATA

Data Subject

Code	44699
Name	Case studies in biotechnology companies
Cycle	Master's degree
ECTS Credits	4.0
Academic year	2024 - 2025

Study (s)

Degree	Center	Acad. year	Period
2224 - Master's Degree in Research and Development in Biotechnology and Biomedicin	Faculty of Biological Sciences	1	First term

Subject-matter

Degree	Subject-matter	Character
2224 - Master's Degree in Research and Development in Biotechnology and Biomedicin	2 - Bioeconomy	Obligatory

Coordination

Name	Department
ANIENTO COMPANY, FERNANDO	30 - Biochemistry and Molecular Biology
FARIÑAS GOMEZ, MARIA ISABEL	357 - Cellular Biology, Functional Biology and Physical Anthropol.

SUMMARY

The course presented corresponds to one of the two subjects within the block dedicated to bioeconomy and is the practical complement to the other subject also included in the same block and called "Innovation in biotechnology: economy and markets". The content taught in this subject aims to familiarize the student with the real situations that companies experience when developing biotechnological products and launching them on the market. These situations do not only involve solving technical problems. On many occasions, success or failure in marketing depends on knowing how to take advantage of gaps in the legislation or not, or on sending attractive messages to the consumer. Legal and commercial frameworks vary between different regions of the planet and this is another fact to consider.



Using the practical case model, the aim is to provoke the student by trying to get him to face situations that correspond to real problems that some professional in the sector has faced. After the presentation of the case, team discussions will be held that force the development of imaginative ideas with which to solve the problem. After finishing these discussions, the teacher will comment on how the problem was solved in the real case and the alternatives will be compared.

This course is intended for students to face business decision situations similar to those that occur daily in biotechnology companies. The fundamental objective is for students to be able to understand that biotechnology is not only research in the laboratory, it is doing it to later put a product on the market. It is intended that they understand that biotechnology is science plus what surrounds the business (legislation and marketing).

This subject constitutes, therefore, a basic element for a better understanding of business activity in the biotechnology sector. It will also be useful for understanding the functioning of markets and the interactions between companies, consumers and institutions.

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 (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

2224 - Master's Degree in Research and Development in Biotechnology and Biomedicine

- 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.
- Critically analyse one's own work and that of colleagues.
- Select and manage available resources (instrumental and human) to optimise research outcomes.



- 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.
- Access the necessary information within the specific subject area (databases, scientific articles, etc.) and have sufficient judgement to interpret and apply it.
- Apply critical reasoning and argumentation based on rational criteria.
- Apply science from a social and economic perspective, promoting the transfer of knowledge to society.
- 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.
- 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.
- Develop scientific results obtained by oneself or other scientists into practical applications with social and/or economic profitability.
- Apply the knowledge acquired to identify career opportunities and sources of employment.
- Gain personal skills that facilitate professional integration and development.
- Know and use job search techniques and tools.
- Consider entrepreneurship as a professional alternative.
- 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.
- Project the knowledge, skills and competencies acquired to promote a society based on the values of freedom, justice, equality and pluralism.
- Handle scientific information sources appropriately and assess them critically, integrating the information to contribute knowledge to multidisciplinary research teams.
- Make proper use of IT tools, statistical and data simulation methods, applying IT tools and statistics to biomedical and biotechnological problems.
- Master the scientific method, the design of experimental protocols and the interpretation of results in the biomedical and biotechnological fields.
- Apply research experience acquired both in private companies and public organisations.
- Design multidisciplinary experimental strategies in the field of molecular biosciences to solve complex biological problems, especially those related to human health.
- Apply ethical and legal principles of scientific research in biotechnology and biomedicine.



- Deepen understanding of the role of biotechnology and biomedicine professionals within the scientific and social context and their contribution to the economic model.
- Design and carry out a complete protocol for the production and purification of a biotechnological product.
- Have an integrated vision of the R&D&I process, from the discovery of new fundamental knowledge to the development of concrete applications and the introduction of new biotechnological products to the market.
- Search for and obtain information from major patent databases and prepare the application report for a biotechnological product patent.
- Know and apply risk assessment criteria in biotechnology and biomedicine.
- Understand the key elements of communication and public perception of biotechnological and biomedical innovations and the risks associated with them.
- Design a market prospective study for a biotechnological product.
- Use inclusive and non-discriminatory language in all the above-mentioned areas of communication.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

The subject will provide students with the necessary tools to understand the functioning of technology-based companies, particularly companies that focus on activities related to biotechnology and biomedicine.

At the end of the course, students must have a global vision of the different industrial applications of biotechnology and how to combine, in the most appropriate way possible, the scientific bases of the creation of a biotechnology company taking into account the legal and commercial reality. They must also have a strategic vision of the biotechnology industries, understanding that to develop one of them, it is as important to apply prestigious scientific knowledge as it is to know how to fit the product to be generated into the appropriate legal and social framework.

DESCRIPTION OF CONTENTS

1. Transfer of knowledge and innovation in biotechnology and biomedicine

From technology transfer to knowledge transfer. Contracts between companies and Universities and Public Research Organizations. Knowledge transfer contracts. Confidentiality.

2. Biotechnology legislation. Intellectual and industrial property.

Industrial property: patents, trademarks, industrial designs. Intellectual property or copyright. Industrial secret.

**3. Creation of biotechnology companies**

Strategies developed by various companies in the sector. Scientific entrepreneurship.

4. Specific cases

They will focus on current topics, such as: Genetic Diagnosis. The future of the agri-food industry (food biotechnology). The problem of GMOs in food. Systems biology in the development of future biotechnological companies and products. Development of new foods and food ingredients. Plants as sustainable biofactories. Synthetic biology tools for the production of biomolecules in plants. The market for biotechnological designer drugs. Phage therapy against multiresistant bacteria.

5. Workshop on professional opportunities

Academy vs. Industry. Research career. Industrial Doctorates.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	40,00	100
Development of group work	40,00	0
Study and independent work	40,00	0
Resolution of case studies	40,00	0
TOTAL	160,00	

TEACHING METHODOLOGY

The subject will have a theoretical part and a practical part. The theoretical part will include sessions taught by different biotechnology professionals, who will narrate their experiences developing biotechnology companies. They will also discuss some current issues in the world of biotechnology. Two sessions will be dedicated to the topic of intellectual and industrial property and industrial secrecy. Finally, the subject includes a career opportunities workshop, to reinforce the professional insertion of its graduates.

The practical part involves the defense by students of a project to create a biotechnology company. To do this, on the first day of class, the students will be divided into several groups and the person responsible for the subject will assign to each group the business model to create. During the following weeks, the students will interact with the responsible teacher to outline the business project. On the last day of class, students must defend their business project in front of the responsible teacher and the rest of their classmates and answer all doubts and questions.



EVALUATION

20% of the grade will correspond to the report presented for the creation of a biotechnology company. Another 20% will correspond to the oral presentation of the project to create said company. The remaining 60% will consist of a continuous evaluation to assess the monitoring of learning, attendance and participation in the sessions.

REFERENCES

Basic

- Para el desarrollo de cada tema se suministrará material de apoyo al alumno que describirá el caso incluyendo información sobre cada una de las compañías analizadas.

Como bibliografía general se recomiendan los siguientes libros.

B. Werth. (2014). The billion dollar molecule: one company's quest for the perfect drug. Simon & Schuster Paperback. Nueva York.

R. Ono. (2016). Business of biotechnology: from the bench to the street. Elsevier.