COURSE DATA

Data Subject	
Code	44699
Name	Case studies in biotechnology companies
Cycle	Master's degree
ECTS Credits	4.0
Academic year	2018 - 2019

Study (s)

Degree	Center	Acad. year	Period
2224 - M.U. Investigación y Desarrollo en Biotecnología Biomedicina	Faculty of Biological Sciences	1	First term

Subject-matter

Degree	Subject-matter	Character
2224 - M.U. Investigación y Desarrollo en Biotecnología Biomedicina	2 - Bioeconomy	Obligatory

Coordination

Name	Department
PEREZ ORTIN, JOSE ENRIQUE	30 - Biochemistry and Molecular Biology

SUMMARY

The course presented corresponds to one of the two subjects within the block dedicated to the bio-economy and involves the practice complement other stuff also included in the same block called "Innovation in biotechnology: economy and markets." The subject in this course aims to familiarize students with real situations that are experienced in biotech companies to develop products and bring them to market. Such situations involve not only solve technical problems. In many cases, success or failure depends on knowing marketing advantage or not gaps in legislation, or to launch attractive messages to the consumer. Legal and commercial frameworks vary between different regions of the world and this is another fact to consider.

Through case studies model it is to provoke the student tried dealing with situations that correspond to real problems suffered by some professional sector. After presenting the case team discussions obliging develop imaginative ideas to solve the problem they will be made. After completing these discussions the teacher discussed as the problem was solved in the real case and alternatives will be compared.

This course aims to provoke students and submit them to situations similar to business decision taken

daily in biotech companies. The main objective is that students be able to understand that biotechnology is not only research in the laboratory, is to do later put a product on the market. It is intended to understand that biotechnology is science and what surrounds the business (legislation and marketing).

By the above, this course is a basic element for a better understanding of business activity in the biotechnology sector. Also it will be to understand the functioning of markets and the interactions between businesses, consumers and institutions.

General cases (items 1 to 4), specific cases (items 5 to 9) and transverse cases (issues 10 to 12), which are detailed below: To meet these objectives a number of cases divided into three blocks are contemplated.

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

2224 - M.U. Investigación y Desarrollo en Biotecnología Biomedicina

- 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.
- Ser capaces de analizar de forma crítica tanto su trabajo como el de su compañeros.
- Capacidad de seleccionar y gestionar los recursos disponibles (instrumentales y humanos) para optimizar resultados en investigación.
- Ser capaces de realizar una toma rápida y eficaz de decisiones en situaciones complejas de su labor profesional o investigadora, mediante el desarrollo de nuevas e innovadoras metodologías de trabajo adaptadas al ámbito científico/investigador, tecnológico o profesional en el que se desarrolle su actividad.

- Ser capaces de acceder a la información necesaria en el ámbito específico de la materia (bases de datos, artículos científicos, etc.) y tener suficiente criterio para su interpretación y empleo.
- Aplicar el razonamiento crítico y la argumentación desde criterios racionales.
- Aplicar la Ciencia desde la óptica social y económica, potenciando la transferencia del conocimiento a la Sociedad.
- Capacidad para preparar, redactar y exponer en público informes y proyectos de forma clara y coherente, defenderlos con rigor y tolerancia y responder satisfactoriamente a las críticas que pudieren derivarse de su exposición.
- Ser capaces de trabajar en equipo, sin discriminación entre hombres y mujeres, con eficiencia en su labor profesional o investigadora adquiriendo la capacidad de participar en proyectos de investigación y colaboraciones científicas o tecnológicas.
- Capacidad para desarrollar los resultados científicos obtenidos por uno mismo o por otros científicos a las aplicaciones prácticas de rentabilidad social y/o económica.
- Ser capaz de aplicar los conocimientos adquiridos en la identificación de salidas profesionales y yacimientos de empleo.
- Adquirir las habilidades personales que faciliten la inserción y desarrollo profesional.
- Conocer y usar las técnicas y herramientas de búsqueda de empleo.
- Considerar el emprendimiento como alternativa profesional.
- Motivación por la calidad y la mejora continua, actuando con rigor, responsabilidad y ética profesional.
- Respeto a los derechos fundamentales y de igualdad entre hombres y mujeres.
- Capacidad de proyectar los conocimientos, habilidades y destrezas adquiridos para promover una sociedad basada en los valores de la libertad, la justicia, la igualdad y el pluralismo.
- Manejar adecuadamente las fuentes de información científica y poseer la habilidad de hacer una valoración crítica de las mismas, integrando la información para aportar conocimientos a grupos de investigación multidisciplinares.
- Utilizar adecuadamente las herramientas informáticas, métodos estadísticos y de simulación de datos, aplicando los programas informáticos y la estadística a los problemas biomédicos y biotecnológicos.
- Dominar el método científico, el planteamiento de protocolos experimentales y la interpretación de resultados en el ámbito biomédico y biotecnológico.
- Ser capaces de aplicar la experiencia investigadora adquirida tanto en la empresa privada como en organismos públicos.
- Saber diseñar estrategias experimentales multidisciplinares en el ámbito de las biociencias moleculares para la resolución de problemas biológicos complejos, especialmente los relacionados con salud humana.

- Saber aplicar los principios éticos y legales de la investigación científica en biotecnología y biomedicina.
- Profundizar en el papel del profesional en biotecnología y biomedicina en el contexto científico y social y su contribución en el modelo económico.
- Saber diseñar y ejecutar un protocolo completo de obtención y purificación de un producto biotecnológico.
- Tener una visión integrada del proceso de I+D+i desde el descubrimiento de nuevos conocimientos básicos hasta el desarrollo de aplicaciones concretas de dicho conocimiento y la introducción en el mercado de nuevos productos biotecnológicos.
- Saber buscar y obtener información de las principales bases de datos sobre patentes y elaborar la memoria de solicitud de una patente de un producto biotecnológico.
- Conocer y saber aplicar los criterios de evaluación de riesgos en biotecnología y biomedicina.
- Conocer los elementos fundamentales de la comunicación y percepción pública de las innovaciones biotecnológicas y biomédicas y de los riesgos asociados a ellas.
- Saber diseñar una investigación prospectiva de mercado para un producto biotecnológico.
- Saber utilizar un lenguaje integrador y no discriminatorio en todos los ámbitos de la comunicación anteriormente mencionados.

LEARNING OUTCOMES

After completing the course students must have an overall view of the various industrial applications of biotechnology and how to combine the most appropriate form the scientific basis for the creation of a biotechnology company with the legal and commercial reality.

After completing the course should have a strategic vision of biotechnological industries, realizing that to develop one as important is to apply the scientific knowledge of prestige as knowing fit the product to generate the appropriate legal and social framework.

DESCRIPTION OF CONTENTS

1. How to transfer research in biotechnology and biomedicine.

The problem of transfer of biotechnological results will arise as it speeds up in different countries. Comparison of the Dutch and the Nordic transfer models with the Spanish model in order to define the strengths and weaknesses of each of them.

2. How to create a biotechnology company.

With their respective CEOs, creating two different biotech companies filed in the Science Park of the University of Valencia it will be analyzed. the different strategies followed in each of the two cases and assess whether they are replicable or not scanned.

3. Biotechnology in EU and Asia.

A comparative analysis will be conducted between the evolution of the biotechnology business in Asia, with particular attention to China and Japan, and the European Union. For it will start from the 80s and the current situation will be analyzed to determine the levels of progress and / or withdrawal of biotech businesses. Finally an exercise of common survey will take place in the classroom to try to understand where and how they could grow in the coming years biotech businesses in the two geographical areas under study.

4. The biotechnology market in the US and LATAM.

It will be held a similar item 3 study but considering these other geographical regions.

5. The market for biotech drugs design

The cases of two of the first biotech products reached pharmacies will be studied. Subsequently, the current use of biotechnology in the pharmaceutical world and its most interesting results will be discussed. special attention to the problem of biosimilars will be provided.

6. The problem of GMOs in food.

The social debate on the marketing of GM foods and crops will be analyzed. Greenpeace / Monsanto dilemma, the French case and the attitude of the large food companies in the production and distribution: special attention to be paid three cases. They will be analyzed separately the risks of these products in food security and environmental impact and the risk / benefit in terms of the impact on the economic model.

7. Systems biology: the future of biotechnology.

Through scientific expert opinion on these issues the role of systems biology in the development of future companies and biotechnology products will be studied. two biotechnology companies created around the use of systems biology will be studied.

8. Biotechnology improvement of flavors.

The various markets of flavors and the possibilities for improvement from biotechnology (in vitro production of aromatic plants, production of aromas by fermentation, construction of transgenic microorganisms that produce flavor) will be analyzed. the positioning of different companies that produce fragrances for biotechnology study.

9. Biotechnological revaluation of waste.

Following examples of biotechnology companies created around these issues, the market revaluation of waste will be analyzed from biotechnology. company models created to isolate compounds from the residue value against companies that produce other compounds of growing microorganisms value on the residue compared. special attention to the case of ethanol and biodegradable plastics with examples of companies working on these issues will be provided.

10. Social perception of biotechnology.

The social perception of the different branches of biotechnology (red, white, green and blue) will be compared as well as that perception varies in different continents. Special attention to European case will be paid and how it affects the development of a biotech business sector. Finally, the discussion will focus on the situation in our country.

11. Legislation in biotechnology: key or padlock?

A comparative review between European law and US will be made and will be studied as based on those differences have accelerated business or spoiled. As a case study the legal framework for the marketing of functional ingredients in USA, LATAM and the EU will be discussed.

12. Intellectual property: past, present and future.

Using the case of probiotics different strategies for intellectual property protection of biotechnological development in the EU and USA will be analyzed. the conflict in USA on the legal protection of the natural and the artificial and the status of biotechnology patents in Argentina: two cases of interest are discussed. Finally the classical model of patent against the black box model will be discussed.

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

Twelve sessions of five hours will be be carried out, divided in a part of previous work in small groups on the proposed topic, some exposure of the solutions found by each working group, and a third part of exposing a case by an expert and a part of general discussion.

The development of the subject is structured around the discussion of cases in classes. After an introduction of the case, the class will be divided into four groups. Each held a detailed discussion of the case supported by the teacher. Then a general discussion of the entire class will be held. Attendance is essential because it ensures the correct transmission of knowledge.

EVALUATION

Passing the course requires obtaining at least half of the score on a written exam lasting no more than two hours and corresponding to 80% of the final grade. The remaining 20% will be allocated to assistance in response to both classes and participation in discussions.

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.