

**COURSE DATA****Data Subject**

<b>Code</b>	43456
<b>Name</b>	Introduction to investigation
<b>Cycle</b>	Master's degree
<b>ECTS Credits</b>	4.5
<b>Academic year</b>	2019 - 2020

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
2210 - M.U. en Investig. Biología Molecular, Celular Genética	Faculty of Biological Sciences	1	First term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
2210 - M.U. en Investig. Biología Molecular, Celular Genética	1 - Introduction to investigation	Obligatory
3102 - Biomedicine and Biotechnology	1 - Complementos de Formación	Optional

**Coordination**

<b>Name</b>	<b>Department</b>
FERRE MANZANERO, JUAN	194 - Genetics

**SUMMARY**

This subject includes a series of activities designed to introduce those aspects of scientific activity that are not normally covered either in other subjects on the degree or in postgraduate subjects. In particular it is intended that students know cross curricular aspects related to research that are different from those relating to the body of knowledge in the area of research activity. These range from knowing the different phases of project planning and sources for funding, until the final dissemination of research results, going through the correct standards of experimental design and statistical analysis of the results and their protection by means of titles of intellectual and industrial property. The presentation of scientific results shall be addressed in oral and written format. Since scientific communication in the areas of Molecular Biology, Cell and Gene is mostly in English, the correct communication of research results in this language will be emphasized.



## 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

### 2210 - M.U. en Investig. Biología Molecular, Celular Genética

- Students can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences, clearly and unambiguously.
- Be able to make quick and effective decisions in professional or research practice.
- Be able to access the information required (databases, scientific articles, etc.) and to interpret and use it sensibly.
- To be able to assess the need to complete the scientific, historical, language, informatics, literature, ethics, social and human background in general, attending conferences, courses or doing complementary activities, self-assessing the contribution of these activities towards a comprehensive development.

## LEARNING OUTCOMES

1. To be able to access the necessary information (databases, books, articles, websites, databases of patents, etc.) and be critical enough to interpret and use them appropriately.
2. To learn how to properly apply mathematical knowledge to design experiments properly.
3. To apply the appropriate statistical criteria to analyze the results.
4. To be able to handle scientific English fluently as a basic tool in oral and written communication.
5. To know the different phases a manuscript goes through from the moment it is finished until it is finally published.
6. To learn how to criticize a scientific text from the point of view of the reviewers of scientific journals.



7. Know how to manage research results, ways to transfer results and their value.
8. Know what research results are likely to be protected, how to protect knowledge and the creation of Spin-off.
9. To learn the basics of communication issues and scientific results to a non-specialist audience clearly and unambiguously.

## DESCRIPTION OF CONTENTS

### 1. THE SCIENTIFIC WORK. LITERATURE MANAGERS. SEARCH IN E-RESOURCES.

THE SCIENTIFIC WORK. LITERATURE MANAGERS. SEARCH IN E-RESOURCES.  
PRÁCTICA Inf-1. SEARCHES IN DATA BASES.

### 2. MATHEMATICAL AND STATISTICAL CRITERIA FOR DESIGNING AND ANALYSING RESULTS.

Experimental design. Data analysis. Hypothesis tests. Power test.  
PRÁCTICA Inf-2. MATHEMATICAL AND STATISTICAL CRITERIA FOR DESIGNING AND ANALYSING RESULTS.

### 3. SCIENTIFIC WRITING IN ENGLISH

Writing papers: stages. Structure: Introduction, body and conclusion.  
PRÁCTICA 1. SCIENTIFIC WRITING IN ENGLISH.

### 4. ENGLISH FOR SCIENCE: ORAL SKILLS

Presenting research at a conference. Body language. Facts and figures. Structure: Introduction, body and conclusion.  
PRÁCTICA 2. ORAL SKILLS IN ENGLISH FOR SCIENCE: PRESENTING RESEARCH IN ENGLISH.

### 5. DIFFERENT PHASES IN THE PUBLICATION OF SCIENTIFIC PAPERS.

Organization of research results in a publishable form. Choice of journal. Quality indexes: the impact factor, the relative position, the h index. Steps that a manuscript goes through from the moment it is submitted until it becomes published.



**6. EDITING AND REVIEWING OF SCIENTIFIC PAPERS.**

The reviewers role. Critical aspects of the review process. Manuscript edition and review.  
PRÁCTICA 3. EDITING AND REVIEWING OF SCIENTIFIC PAPERS.

**7. INNOVATION MANAGEMENT I**

General concepts about innovation. Disclosure versus Transfer. Capabilities and results of research in UV. Pathways for the transfer of results and research capacities. R & D ContractED and technology licenses.

**8. INNOVATION MANAGEMENT II**

Proof of concept projects. Process of valorization and protection of research results. Introduction to industrial and intellectual property. Creation of Spin-off companies. Entrepreneurship in the UV. Empren + program.

**9. DISSEMINATION OF SCIENTIFIC SUBJECTS TO THE NON SPECIALIZED PUBLIC**

How to simplify our words. How to deal with the media.

**WORKLOAD**

<b>ACTIVITAT</b>	<b>Hours</b>	<b>% To be attended</b>
Theory classes	25.00	100
Computer classroom practice	9.00	100
Classroom practices	9.00	100
Other activities	2.00	100
Development of individual work	33.00	0
Preparation of evaluation activities	20.00	0
Preparing lectures	15.00	0
<b>TOTAL</b>	<b>113.00</b>	

**TEACHING METHODOLOGY**



The subject is structured in a semester. It includes lectures, practical lessons in the classroom and practices.

Theory lessons will be lecture-type and they consist of sessions ranging from one to one and a half hour. The total number of contact hours is 27.

Practical lessons can be divided into two types: some will be in the computer lab and will require computer work, and others will take place in the classroom. The latter will consist in solving exercises and questions proposed by the teacher beforehand and an oral presentation in English of a research topic, either his/her own master thesis topic or other topic related to it. The total number of contact hours for practical lessons 18.

The total figure is 45 contact hours.

## **EVALUATION**

The subject will be evaluated following this procedure:

- An individual test consisting on the review of a scientific paper. The value of the test shall be 15% of the total.
- Written work: An assessment of the student's ability to confront and solve practical problems will be done by setting exercises to be done in class or at home. The value of all these tests shall be 55% of the total.
- Oral Presentations in English: The skills acquired to deliver oral presentations in English will be assessed by giving a talk to the class in which learners will have to evaluate both the content of the talk and the performance, highlighting possible mistakes. The mark of the oral presentations will consider both the delivery and the active participation in class; its value will be 25% of the total.
- Class attendance: Class attendance will have a value of 5% of the final grade.

Other considerations:

The final grade will be the sum of the grades achieved in the different sections. To pass the subject it is necessary to obtain an overall grading equal or higher than 5 out of 10.

For students who do not pass the course in the first call, the mark of the different sections will be saved for the second call, only if it is higher than 5 out of 10, unless the student renounces them (sitting himself/herself in the second call and presenting the relevant section in the examination).



## REFERENCES

### Basic

- American Society of Microbiology. Guidelines for reviewers for ASM Journals. 2015
  - Armer, T. Cambridge English for Scientists. Cambridge University Press. 2015.
  - Anónimo. Tutorial for reviewers for Elsevier Journals. Elsevier; 2015
  - Escorsa, P., Valls Pasola, J.& Universitat Politècnica de Catalunya. (2003) Tecnología e innovación en la empresa. Barcelona : Edicions de la Universitat Politècnica de Catalunya.
  - Moody, J.B.;& Dogson, M. (2006). Managing complex collaborative projects: lessons from the development of a new satellite. Journal of technology transfer, 31, 567-588.  
doi:10.1007/s10961-006-9059-y
  - Nowotny, H., Scott, P. & Gibbons, M. (2003). Mode 2' revisited: The new production of knowledge Introduction. Minerva, 41(3), 179-194.
  - Packendorff, J. (2005). Inquiring into temporary organization: new directions for project management research. Scandinavian Journal of Management, 11 (4), pp. 319-333. doi:10.1016/0956-5221(95)00018-Q
  - Primo Yúfera, 1918-2007.(1994). Introducción a la investigación científica y tecnológica. Madrid : Alianza, 399 pp.
  - Sánchez Tamés, R. Sánchez Sotres, R., & Universidad de Oviedo. (2004). Cómo publicar. Oviedo: Universidad de Oviedo
  - Fundamentos de estadística para las ciencias de la vida, Samuels, M.  
[http://trobes.uv.es/record=b2160247~S1\\*val](http://trobes.uv.es/record=b2160247~S1*val)
  - Recursos informáticos:
    1. San Francisco Edit: Scientific, Medical and General Proofreading and Editing  
[www.sfeddit.net](http://www.sfeddit.net)  
Proporciona una colección de fichas sobre las instrucciones detalladas para la buena práctica de escribir artículos científicos.
    2. SciWrite: Writing in the Sciences  
<https://class.stanford.edu/courses/Medicine/SciWrite/Fall2013/about>  
Cursillo gratuito on line sobre cómo escribir y revisar artículos científicos.
    3. PUBMED  
<https://www.ncbi.nlm.nih.gov/pmc/>  
Contiene MEDLINE y otras revistas científicas en el campo de la Biomedicina. Acceso al texto completo de los artículos.
    4. WEB of Science  
[https://apps.webofknowledge.com/UA\\_GeneralSearch\\_input.do?product=UA&search\\_mode=GeneralSearch&SID=D1eNwA6dZky3aXDzReX&preferencesSaved=](https://apps.webofknowledge.com/UA_GeneralSearch_input.do?product=UA&search_mode=GeneralSearch&SID=D1eNwA6dZky3aXDzReX&preferencesSaved=)  
Incluye índices de citas como Science Citation Index Expanded, Social Science Citation Index, Art & Humanities Citation Index, Conference Proceedings Citation Index (Science y Social Science & Humanities), índices químicos como Index Chemicus y Current Chemical Reactions; la colección de revistas Emerging Sources Citation Index (ESCI); Current Contents Connect (7 series), Derwent Innovations Index, MEDLINE, Korean Journal Database (KCI) y Scielo
- Base de datos con diferentes entradas (tema, título, autor, año, nombre de la publicación). Permite también saber el índice de impacto de las diferentes revistas y el lugar que ocupan en el ranking según el área.



- 5. Journal Citation Reports  
<http://links.uv.es/h3VnnDN>

Datos estadísticos de las principales revistas científicas a nivel internacional (unas 7.000), basados en el análisis de las citas que emiten y reciben las publicaciones. JCR es considerada como una herramienta para la evaluación de las publicaciones y ofrece información sobre el factor de impacto de las revistas, su ranking mundial, su vida media, etc. Contiene dos series: Ciencias y Ciencias sociales

- 6. Essential Science Indicators

<http://esi.incites.thomsonreuters.com/IndicatorsAction.action?Init=Yes&SrcApp=IC2LS&SID=H3-fLcq3kEBBUgvnvnoMqIMZUqd2xBd5ty9-OJfMGRiF9uzMzW0ATCA9nZHc6IYNTI0Qeyw0rG7FCB1L6qJ6NjuHwuppoIC6q0o-9vvmzcdpRgQCGPd1c2qPQx3Dx3D-wx2BJQh9GKVmtdJw3700KssQx3Dx3D>

Herramienta que ofrece datos para establecer rankings de investigadores, instituciones, países y revistas

- 7. Programari informàtic: The R Project for Statistical Computing: <https://www.r-project.org/>

- 8. Oficina Europea de patentes  
<http://www.epo.org>

- 9. RedOTRI de Universidades (2010) La I+D bajo contrato: aspectos jurídicos y técnicos. Segunda edición. Cuadernos técnicos RedOTRI. Madrid

[http://www.redotriuniversidades.net/portal/index.php?option=com\\_joomdoc&task=cat\\_view&gid=629&Itemid=100016](http://www.redotriuniversidades.net/portal/index.php?option=com_joomdoc&task=cat_view&gid=629&Itemid=100016)

- 10. RedOTRI de Universidades (2010) La I+D colaborativa. Buenas prácticas para la gestión de la propiedad intelectual e industrial. Segunda Edición. Cuadernos técnicos RedOTRI. Madrid

[http://www.redotriuniversidades.net/portal/index.php?option=com\\_joomdoc&task=cat\\_view&gid=629&Itemid=100016](http://www.redotriuniversidades.net/portal/index.php?option=com_joomdoc&task=cat_view&gid=629&Itemid=100016)