

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

Code	34003
Name	Introduction to Research
Cycle	Grade
ECTS Credits	6.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
1103 - Degree in Food Science and Technology	Faculty of Pharmacy and Food Sciences	4	First term

Subject-matter

Degree	Subject-matter	Character
1103 - Degree in Food Science and Technology	31 - Introduction to research	Optional

Coordination

Name	Department
ANDREU SANCHEZ, OSCAR ENRIQUE	25 - Plant Biology
CARBO VALVERDE, ESTER	25 - Plant Biology
ROCA PEREZ, LUIS	25 - Plant Biology

SUMMARY

Introduction to Research Methods is a fourth year elective course in Bachelor's Degree in Food Science and Technology, which is taught in the Faculty of Pharmacy, University of Valencia. This course has a total of 6 ECTS credits to be given in the first semester.

The aim is focussed to provide the tools to start in the research and to understand and to properly use the various tools and resources currently available for research. For this reason, the student will learn the application of scientific method from the generation of working hypotheses, planning experiments, sampling and data generation, interpretation of results and reporting them to the scientific community and society. This will include management of the main sources of scientific information and databases, ethical issues and the ongoing development of a scientific career both nationally and internationally.



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

1103 - Degree in Food Science and Technology

- Capacidad de manejar el inglés como vehículo de comunicación científica.
- Adquirir habilidades básicas para buscar referencias científico-técnicas de calidad en las distintas fuentes de información.
- Know the main forums for scientific discussion and their usual operation.
- Be able to write, present and defend research outcomes.
- Understand what a doctoral thesis is and how to write it and present it.
- Be able to fill in an application form for a research project.
- Know the ethical constraints of research in health sciences.

LEARNING OUTCOMES

- To understand the scientific method and its aplicación.
- To know the environment of scientific research and the main tools and resources used in the laboratory.
- To know the main sources of scientific information and how they are used to perform literature searches.
- To know formulate hypotheses and planning experiments to contrast.
- To know how to interpret and communicate the results of scientific research.
- To understand the current structure of the scientific career as developed in the public and private sectors.

DESCRIPTION OF CONTENTS

1. Science and scientific method

1. Introduction to scientific research.

Definitions. Purposes of scientific research. Methods of scientific research. The confusion between science and technology.

2. The scientific method.

Origin of scientific questions. Application of scientific method. Boundaries between science and



pseudoscience.

2. The research process

3. The literature review.

The state of affairs. Sources of bibliographic information. Management databases. Storage of information.

4. The research project.

Writing of a research project. Types of projects and funding sources. Project management. Monitoring and projectos.

5. The laboratory work.

Experimental design. The laboratory notebook. Safety in the laboratory. Good laboratory practice. Teamwork.

6. Analysis of experimental results.

Qualitative and quantitative studies. Statistical methods. Interpretation of results and drawing conclusions.

7. Scientific communication.

Types of scientific communications. Structure of the paper. Authorship. How to make tables and graphs. The popularization of science.

8. The Final Degree Project, Master's Final Project and Doctoral Thesis.

3. The scientific career

9. Basic and applied research.

Basic research. Applied research. Technology.

10. Public research and private research.

The public inquiry. Research in the company.

11. The scientific career and professional opportunities.

The graduate. The PhD. The postdoc. The scientific profession. University research.

4. Computing Practices

1) Search of references in bibliographic databases, storage in references manager software and introduction to the redaction of a scientific document.

2) Search and analysis of calls for scholarships and research grants. Search and analysis of research projects calls of national and international organizations. Search of national and international patents.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	45,00	100
Computer classroom practice	8,00	100
Seminars	2,00	100
Tutorials	2,00	100
Development of group work	10,00	0
Development of individual work	30,00	0
Study and independent work	20,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	15,00	0
Preparing lectures	5,00	0
Preparation of practical classes and problem	5,00	0
TOTAL	147,00	

TEACHING METHODOLOGY

The theory classes are face-to-face, the student will receive the most important concepts and contents of each subject. In the classroom, activities, work or theoretical-practical tests related to the topics will be carried out individually or in groups in order to encourage student participation and teacher-student interaction. The student will have at his/her disposal in the virtual classroom the necessary material for each subject. In theory classes, experts may be invited to give lectures related to the subjects of the course.

The tutorials are aimed at resolving questions related to the theoretical and practical classes, as well as directing proposed work or activities.

The **computer work** will favor the relationship between knowledge and its application to practice.

Seminars will be held on topics proposed by the lecturer or proposed by students related to the degree. The preparation of the seminar will be supervised by the teacher. The work will be presented by the students.

During the theoretical classes in some of the topics, examples of the applications of the contents of the course in relation to the Sustainable Development Goals (SDGs) will be given. The aim is to provide students with the knowledge, skills and motivation to understand and address the SDGs.



EVALUATION

- a) Coordinated Seminars, consisting of the presentation and defence of reports related to the contents explained and discussed in the classroom. Written work will be assessed as well as the level of understanding of the contents and the skills for their presentation, defence and discussion (10%).
- b) Written exams and activities/tests (65%). Broken down into a final written exam with questions on the theoretical content (40%) and activities, work or tests carried out in theory class (25%).
- c) Assessment of the computer practices work, through supervision of the work carried out, the ability to solve the problems posed in the practices and the ability to produce detailed and well organised reports. A practices report will be submitted (15%).
- d) Continuous assessment: attendance to theory classes, participation in class discussions, problem solving skills (10%).

Attendance to seminars, practicals and tutorials are of **MANDATORY ATTENDANCE** and, therefore, **NOT RECOVERABLE**, in accordance with the provisions of article 6.5 of the Regulation of Evaluation and Qualification of the UV for Bachelor and Master degrees. In the event that, for justified reasons, it is not possible to attend any of these activities, you must communicate with sufficient notice. In this way, the person in charge of the subject will be able to assign the student a session in another group. In order to pass the course and compensate between the different parts, it is necessary to have a 4 out of 10 in the final written exam.

Evidence of copying or plagiarism in any of the assessable tasks will result in failure to pass the subject and in appropriate disciplinary action being taken. Please note that, in accordance with article 13. d) of the Statute of the University Student (RD 1791/2010, of 30 December), it is the duty of students to refrain from using or participating in dishonest means in assessment tests, assignments or university official documents.

In the event of fraudulent practices, the “Action Protocol for fraudulent practices at the University of Valencia” will be applied (ACGUV 123/2020):

<https://www.uv.es/sgeneral/Protocols/C83sp.pdf>

REFERENCES

Basic

- Chalmers A.F. (2000). ¿Qué es esa cosa llamada ciencia? 3ª edición. Siglo XXI de España, editores.
- Echeverría J. (1999). Introducción a la metodología de la ciencia. La filosofía de la ciencia en el siglo XX. Ediciones Cátedra.



- Ebel, Hans F. (2004) The art of scientific writing. Wiley-VCH: Weinheim (Alemania).
- Primo-Yúfera E. (1994). Introducción a la investigación científica y tecnológica. Alianza Editorial.
- Quinn G. P. and Keough M. J. (2002). Experimental design and data analysis for Biologists. Cambridge University Press.
- Ramón y Cajal S. (1999). Reglas y consejos sobre investigación científica. Los tónicos de la voluntad. Colección Austral 232. Espasa Calpe.
- Radnitzky G. y Andersson G. (1982). Progreso y racionalidad en la ciencia. Alianza Universidad Textos, 46. Alianza editorial.
- Gutierrez N., Ijalba P., Rodriguez M. (2022). Iniciación a la investigación: guía para estudiantes y docentes. Universidad Pública de Navarra.
- Day, R. A. (2014). Cómo escribir y publicar trabajos científicos. [Internet] Washington: Organización Panamericana de la Salud. 270 p. Disponible en: http://new.paho.org/hq/dmdocuments/2010/9275315981_reduce.pdf
- Gómez M. (2015). Introducción a la metodología de la investigación científica. 2ª ed. Brujas. Córdoba.

Additional

- Bernabeu i Mestre, J. (2008). Investigación e innovación tecnológica en la ciencia de la nutrición: el abordaje de la malnutrición en el contexto de la cultura científica. ECU Editorial: San Vicent: España
- Contento, I. R. (2007). Nutrition education: linking research, theory, and practice. Jones and Bartlett Publishers: EEUU
- Ireton-Jones C.S., Gottschlich, M.M., Bell, S. J. (1999). Practice-Oriented Nutrition Research: An Outcomes Measurement Approach. Jones and Bartlett Publishers: EEUU
- Koh, E.T. (2000). Introduction to Nutrition and Health Research. Springer: Alemania
- Miján de la Torre, A. (2002). Técnicas y métodos de investigación en nutrición humana. Glosa Editorial: España.
- Barnard, C. Gilbert F. y McGregor P. (1993). Asking questions in biology. Design, analysis and presentation in practical work. Longman group UK limited.
- Brown D.y Rothery P. (1993). Models in biology: mathematics, statistics and computing. John Wiley and sons.
- di Trocchio F. (1998). Las mentiras de la ciencia. Libro de bolsillo CT2500. Alianza Editorial.