

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

<b>Code</b>	34073
<b>Name</b>	Documentation and Scientific Methodology
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	4.5
<b>Academic year</b>	2018 - 2019

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1201 - Degree in Pharmacy	Faculty of Pharmacy and Food Sciences	1	First term
1211 - D.D. in Pharmacy-Human Nutrition and Dietetics	Faculty of Pharmacy and Food Sciences	1	First term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1201 - Degree in Pharmacy	36 - Scientific methodology and documentation	Obligatory
1211 - D.D. in Pharmacy-Human Nutrition and Dietetics	1 - Asignaturas obligatorias del PDG Farmacia-Nutrición Humana y Dietética	Obligatory

**Coordination**

<b>Name</b>	<b>Department</b>
VIDAL INFER, ANTONIO MARTÍN	225 - History of Science and Documentation

**SUMMARY**

What is usually called "scientific method" is a set of theoretical and experimental practices very diverse characteristics vary over time and space and across disciplines and various fields of science. Even within a single scientific discipline, there are diverse views on the best ways to get sufficiently used to produce new knowledge. Therefore, in this block use the expression "scientific methodology" to refer to the heterogeneous set of strategies, procedures, reasoning, experimental practices, observational methods, etc. following scientists in their investigations, which are developed in a variety of places (observatories, laboratories, geological sites, hospitals, factories, etc.), often with the help of scientific instruments of very different characteristics. And all this in the context of certain societies and cultures very variable condition of the development of scientific activity over time.



In parallel to the great development and has taken on dimensions that modern science during the twentieth century, the discipline of information science has developed a range instruments for recording scientific production and facilitate rapid access to accurate information. Likewise, the large expansion that has seen the Internet as a communication and dissemination of information made available to researchers and users a lot of resources and information sources, regardless of spatial boundaries and intermediaries, so is essential from the field of training to introduce students to the knowledge and use of these tools and resources to be able to develop the skills to locate and manage the information they need or may be of interest to the exercise in their professional and research activities.

The aim of the course is to provide basic concepts and schemes to address the issue through various special cases (seminars). First, we discuss several specific topics, closely related to the pharmacy: anatomical dissection, animal experimentation and clinical trials. It is also dedicated to a specific scientific terminology along with a brief introduction to the various types of scientific instruments.

## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

### Other requirements

Previous requirements or recommendations

Being an introductory course, no prerequisites are required apart from skills and knowledge provided by high school studies. However, it should be noted that the theoretical and practical seminars involve the use of a great deal of abstract thinking, adoption of a diachronic analysis and dealing with various societies and cultures, especially in the Western tradition. Moreover, it involves and the use of documentary sources and resources in electronic format, invo

## OUTCOMES

### 1201 - Degree in Pharmacy

- Development of skills to update their knowledge and undertake further studies, including pharmaceutical specialization, scientific research and technological development, and teaching.
- Ability to collect and transmit information in English with a level of competence similar to the B1 of the Council of Europe.
- Module: Legislation and Social Pharmacy to master information retrieval techniques related to primary and secondary information sources (including databases by using computers) and computerized.
- Module: Legislation and Social Pharmacy - Know the techniques of oral and written communication by acquiring skills that allow informing users of pharmaceutical establishments in terms intelligible and appropriate to various cultural levels and social environments.



## LEARNING OUTCOMES

This course will be an introduction to the sources of scientific information, defining the main types of documents, characterizing their informative and useful ways to access them. Shall set forth the procedures for identifying and selecting the desired information in the supply systems of scientific information by identifying the major databases in health sciences, and search strategies and more appropriate interrogation techniques to identify documents that satisfy the information needs of the user. We will discuss some of the tools and procedures to manage and evaluate relevant documents selected. Thus, several issues related to scientific methodology in biomedical sciences will be shown: scientific terminology, anatomical dissection, scientific instruments, animal experiments and clinical trials. In the practical sessions, some of the most important scientific research will be shown, described as the protagonists, so that it is possible to approach "science in action." It is also intended to show the connections and interactions between science, society and culture. Thus, we will discuss some aspects of the relationship between science, technology and society. The aim is to offer clues that allow reflection on the methods of science and its role in society, thereby providing a humanistic and interdisciplinary approach, so that students can foster the integration of knowledge and approach the analysis of situations which require knowledge of several disciplines.

## DESCRIPTION OF CONTENTS

### 1. Introducing Documentation and Scientific Methodology

### 2. Main sources of information

- Concept of source of information
- Main sources of information

### 3. Bibliographic searches

- Databases: general features and ways of access.
- Bibliographic searches: search strategies.

### 4. Main databases

- Main multidisciplinary databases.
- Main Health Sciences databases.
- Other databases.

### 5. The abstract



## **6. Elaboration of bibliographies**

- Characteristics and constituent elements
- Styles of presentation of bibliographical references.
- Vancouver style
- Computer programs for the management of bibliographic references.

## **7. Internet and Scientific literature**

- Definition and concept of open access to information.
- Access open to scientific information in Health Sciences.

## **8. The scientific revolution**

- The notion of Scientific Revolution
- The paradoxical program of the humanists
- The Protestant Reformation and the Catholic Counter Reformation
- Two major transformations in knowledge: the macrocosm and the microcosm
- Changes in natural philosophy
- Institutional news
- Conclusions

## **9. Animal experimentation**

1. History of animal experimentation
  - Antiquity
  - Middle Ages and Renaissance
  - Scientific revolution
  - The experimental physiology of the s. XIX
2. Laboratory animals
  - Definition
  - Type
3. Meaning and uses
  - Experimental models
  - Uses
4. Ethical and legal aspects
  - Movements against animal experimentation
  - Limitation of the number of sacrificed animals and pain
  - Legislation and ethics of animal experimentation



## **10. Scientific terminology**

- Introduction
- Origins and basic elements
- The construction of the terms
- Problems in the use of terminology
- Nomenclatures and classifications
- The name of the medications

## **11. Clinical trials**

- Introduction
- Methodology
- Selection of the sample
- Randomization
- Mask
- Types of clinical trials
- Stages and evaluation
- Ethical problems
- Current legislation

## **12. Science, Medicine and Technology**

- The anatomoclinic medicine
- Laboratory medicine
- Pathophysiology
- Medical microbiology
- Physics and medicine
- The technification of medicine

## **13. Pharmacy as a discipline and profession**

1. Generalities:
  - The concept of profession
  - The concept of discipline
  - The origins of the pharmacy
2. Evolution of the pharmacy as a profession and discipline:
  - From the trade union formation to the university
  - Knowledge
  - The control
  - Professional societies
  - Ethical codes
  - The public image of the pharmacy
3. Higher education and development cooperation (Agenda 2030)



**14. The pharmaceutical industry**

- An artisan industry
- The first industries
- The second half of the 19th century
- Growth and expansion (1890-1914)
- The First World War and the interwar period
- World War II
- The new developments since 1950
- The current situation

**15. Scientific communication**

- The culture of the scribes
- The diffusion through the motley letter
- The informational challenges in current science
- The dissemination of medicine and pharmacy
- The dissemination models of science
- Protagonists, spaces, media and topics of scientific dissemination

**16. Bioethics**

- Brief history of a young discipline
- Medical ethics
- Theoretical approaches to bioethics
- Bioethics in Spain

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	25,00	100
Seminars	10,00	100
Computer classroom practice	5,00	100
Tutorials	2,00	100
Development of group work	30,00	0
Study and independent work	8,00	0
Readings supplementary material	2,50	0
Preparation of evaluation activities	25,00	0
Preparation of practical classes and problem	2,00	0
<b>TOTAL</b>	<b>109,50</b>	



## TEACHING METHODOLOGY

The development of the course is structured around four types of activities in addition to research activities, preparation of classes and final exam: the lectures, practical classes in the classroom, computer practical classes and tutorials.

**Lectures.** Students must acquire basic knowledge on the agenda through self-study and attendance at the lectures. In these classes, the teacher will give an overview of the topic, have an impact on those key concepts for the understanding of it and answer any questions or issues. For individual study and preparation of the subject in depth, they provide students with a basic and additional bibliography, addresses, Internet and support material, as well as instructions and tips for handling information sources.

**Practical lessons in the classroom.** Activities that will be developed to complement the knowledge acquired in lectures, through exercises that will complete an **activity book** that should be done individually for presentation to the completion of the course. A part of the lessons will be completed at the computer classroom. The attendance to the practical sessions is mandatory.

**Seminars.** Five monographic seminars will be conducted in the computer room. The theoretic-practical contents of the course will be applied through the knowledge of the information resources of the University of Valencia, the control of a bibliographic manager, the reading and analysis of a scientific article, the analysis of pharmacological terms and the discovery of the pharmaceutical industry functioning. The results will be assessed through a set of activities that will be included in the workbook. The attendance to the seminars is mandatory.

**Tutorials.** Students will come to them in small groups. In them, students will focus on methods of work more to improve learning achievement and completion of the activity book. The attendance to the tutorial sessions is mandatory.

## EVALUATION

**Theoretical evaluation:** A written final exam will be carried out, which will represent 50% of the grade. It will be necessary to obtain a minimum grade of 4 in the exam's mark to pass the subject.

**Practical evaluation:** A workbook (40%) and a conceptual map (10%) will be presented. The workbook will contain all the contents of the practices and seminars of the subject. The workbook will be made individually or in pairs and will be presented through the virtual classroom. In the case of working in pairs, each of the members must present the workbook and the name of the two students will be recorded as well as how the work within the group has been organized. In case that a part of the workbook cannot be completed, it must be left blank. The presentation of a copied part of another work will mean the suspension of the subject and the possible opening of a disciplinary file. It will be necessary to obtain a minimum score of 4 (both in the workbook and the conceptual map) to pass the subject. If the workbook is done jointly, it must be presented by the two people who perform it in their corresponding sections of



Virtual Classroom Tasks.

## REFERENCES

### Basic

- Ferragud C, Vidal A, Bertomeu JR, Lucas R. Documentación y metodología en ciencias de la salud. Valencia: Nau Llibres; 2017.
- Ferran Ferrer N, Pérez-Montoro Gutiérrez M. Búsqueda y recuperación de la información. 1ª en lengua castellana ed. Barcelona: Editorial UOC; 2009
- Fara P. Breve historia de la ciencia. Barcelona: Ariel; 2009.
- Bowler P, Morus I. Panorama general de la ciencia moderna. Barcelona: Crítica; 2007
- Collins H et al. El gólem: lo que todos deberíamos saber acerca de la ciencia. Barcelona: Crítica; 1996
- Cordon García JA. Las nuevas fuentes de información: información y búsqueda documental en el contexto de la web 2.0. Madrid: Pirámide; 2010.

### Additional

- Informe APEI sobre acceso abierto | E-LIS. E-prints in Library and Information Science Disponible en: <http://eprints.rclis.org/handle/10760/12507>. Fecha de acceso 5/31/2011, 2011.
- Cordon García JA, López Lucas J, Vaquero Pulido JR. Manual de investigación bibliográfica y documental: teoría y práctica. Madrid: Pirámide; 2001.
- Cordon García JA, López Lucas J, Vaquero Pulido JR. Manual de búsqueda documental y práctica bibliográfica. Madrid: Pirámide; 1999
- Hernández Sampieri R, Fernández Collado C, Baptista Lucio P. Metodología de la investigación. 5a ed. Madrid: McGraw-Hill; 2010
- Jiménez Villa J, Argimón Pallás JM, Martín Zurro A. Publicación científica biomédica: cómo escribir y publicar un artículo de investigación. Barcelona: Elsevier Science; 2010
- Pinto Molina M, Mitre M, Doucet A, Sánchez MJ. Aprendiendo a resumir: prontuario y resolución de casos. Gijón: Trea; 2005