

**Scientific Methodology and Biostatistics**

Code: 101820  
ECTS Credits: 6

Degree	Type	Year	Semester
2500891 Nursing	FB	1	1

### Contact

Name: Maria Feijoo Cid  
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### Use of Languages

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

### Teachers

Rosa García Sierra  
Albert Navarro Giné  
Josep Maria Manresa Domínguez

### Prerequisites

None

### Objectives and Contextualisation

This subject contains the basic training in scientific methodology and biostatistics of the degree. Nurses, when practicing their profession, face a set of situations-problems that put their abilities to the test (selection of information, organization of reasoning, distinction between the fundamental and the accessory, statistical interpretation of health problems, etc.)

The purpose is to structure a critical and thoughtful thinking that allows the critical reading of research in health sciences and the analysis of health problems using statistics to promote a practice nurse of excellence.

The subject raises the basic knowledge and skills to apply in the accomplishment of the degree's final project.

### Competences

- Acquire and use the necessary instruments for developing a critical and reflective attitude.
- Analyse and synthesise complex phenomena.
- Base nursing interventions on scientific evidence and the available media.
- Demonstrate knowledge of health information systems.
- Develop independent learning strategies.
- Express in a fluent, coherent and appropriate manner the established rules, both orally and in writing.
- Find, evaluate, organise and maintain information systems.
- Use scientific methodology in interventions.

## Learning Outcomes

1. Acquire and use the necessary instruments for developing a critical and reflective attitude.
2. Analyse and synthesise complex phenomena.
3. Compare the characteristics of the principal information systems.
4. Describe the elements inherent in the research process from a scientific article in the field of nursing.
5. Describe the elements necessary to define the scientific evidence in the original article.
6. Describe the main characteristics of the principal information systems.
7. Develop independent learning strategies.
8. Express in a fluent, coherent and appropriate manner the established rules, both orally and in writing.
9. Find, evaluate, organise and maintain information systems.
10. Identify the different levels of scientific evidence based clinical practice scenarios.
11. Interpret statistical results of a scientific article and its potential impact on clinical practice.
12. Relate scientific methodology to scientific methods and the solution of problems.

## Content

Below is a brief description of the subject:

1. Bases of scientific knowledge: Sources and types of human knowledge. The scientific method. the scientific method's characteristics and limitations.
2. Quantitative and qualitative methodologies: Introduction and differences between the two.
3. Research process: Relationships between the scientific method, the research process and a scientific article. Purpose and type of scientific research. Main phases.
4. Research problem and hypothesis formulation.
5. Review and bibliographic search.
6. Study design. Sample and Population.
7. Methods of data collection.
8. Evaluation of scientific articles: internal validity and external validity. Nursing based on evidence..
9. General concepts of statistics: basic terminology of research and statistics. Principles of the measure
10. Recollection, tabulation and graphic presentation of results.
11. Basic principles of descriptive inferential statistics.
12. Handling of statistical data files.
13. Presentation and interpretation of results in scientific articles.

## Methodology

The different learning methodologies make up both the theoretical content and the skills corresponding to a reflective-critical thinking in problem solving.

Nursing interventions will be analyzed from original articles in the field of nursing care and the decision making will be established based on the critical reading of them.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
LABORATORY PRACTICES (LABP)	16	0.64	9, 3, 6, 7, 12
SEMINARS (SEM)	11	0.44	1, 2, 5, 4, 7, 8, 10, 12
THEORY (T)	26	1.04	5, 4, 7, 10, 11, 12
Type: Autonomous			

## Assessment

The subject is presented in two evaluation blocks: scientific methodology and biostatistics with different evaluation activities. All written assessment activities use objective tests (items from multiple choice, wide-ranging essay test, restricted-choice essay test) and oral evaluation (structured test - analysis of an original article) are mandatory, in case of not submitting will be grade as Non- Evaluable (NE) and will be quantified as zero (0).

-The qualification of each block of the subject (scientific methodology and biostatistics) is the weighted average of the different assessment activities of each block as long as the grade of each one of these is equal to or greater than 4. In cases where any of the assessment activities is lower than 4, the resultant numerical note will be the weighted average note according to the previous criteria whenever it is inferior to 5, or it will be set to 4.3 provided that the weighted average is greater than 5.

-The final grade of the subject is the weighted average of the two blocks of knowledge (scientific methodology and biostatistics), as long as the mark of each of them is equal or higher than 4.5. In the cases where the resultant mark of one of the blocks of knowledge is less than 4.5, the note resulting numerical will be the weighted average grade whenever it is less than 5, or it will be set to 4.8 whenever the weighted average is greater than 5.

Definition of NOT EVALUABLE (NE): In each block of knowledge, both scientific methodology and biostatistics, it will be understood by Non evaluateable (NE) that situation in which the student is NOT present to 50% or more than the evaluation activities. Likewise, having a NE in one of the blocks will be a NE throughout the whole subject.

Tests Review: All students have the right to review the evaluation tests by appointment with the teacher. The revision will consist of an individual tutoring where the student will be given the feedback in relation to his evaluation.

The treatment of possible individual cases will be carried out through a teaching committee (formed by the coordinator of the subject, and 2 of the professors of the same, 1 of each department involved) where the situation will be evaluated particular of the student and the most appropriate decisions will be taken.

Students who have not passed the subject through continuous assessment may submit to a retake exam as long as the student has been assessed for the two thirds of the total grade of the subject. This retake exam will include the entire block of knowledge failed.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Objective tests: multiple choice items (BLOC: Biostatistics)	27.5%	2	0.08	2, 11
Objective tests: multiple choice items (BLOC: scientific methodology)	30%	1.5	0.06	1, 2, 3, 5, 4, 6, 7, 10, 12
Objective tests: test for broad questions (BLOC: Biostatistics)	20%	1	0.04	1, 2, 9, 5, 7, 8, 11
Objective tests: test of restricted questions (BLOC: Biostatistics)	2.5%	0.5	0.02	1, 2, 7, 8, 11
Oral assessment: Structured test (BLOC: scientific methodology)	20%	2	0.08	1, 2, 9, 5, 4, 7, 8, 10, 12

## Bibliography

## Selected References

1. Grove SK., Gray JR., Burns N. Investigación en enfermería. Desarrollo de la práctica enfermera basada en la evidencia. Madrid. Elsevier. 6a ed. 2016
2. Polit DF.; Beck CT. Essentials of nursing research: Appraising Evidence for Nursing Practice. Philadelphia : Wolters Kluwer/Lippincott/Williams & Wilkins Health. 8th ed. 2010
3. Cobo E, Muñoz P, González JA. Bioestadística para no estadísticos: principios para interpretar un estudio científico. Barcelona: Elsevier Masson, 2007.
4. Argimon J.M., Jimenez J. Métodos de investigación clínica y epidemiológica. 4ª ed. Barcelona: Elsevier España, SA, 2013.
5. Burns N., Grove S. K. Investigación en enfermería. Madrid. Elsevier 5a ed. 2012.
6. Kate G, Anne L. Investigación en enfermería. 5ª ed. Madrid: McGraw-Hill-Interamericana, 2008
7. Martín M, Horna O, Nedel FB, Navarro A. Fundamentos de estadística en ciencias de la salud. Bellaterra: Servei de publicacions UAB, 2010.

## Referral References

1. Rodríguez del Águila M.M, Pérez S., Sordo L., Fernández M. A. Cómo elaborar un protocolo de investigación en salud Med Clin (Barc). 2007; 129(8): 299-302.
2. Fuentelsaz C. Cálculo del tamaño de la muestra. Matronas Profesión. 2004; 5(18): 5-13.
3. Fernández de Sanmamed MJ Adecuación de las normas de publicación en revistas científicas a las investigaciones cualitativas. Atención Primaria. 2000; 25(7): 118-122
4. Fernández de Sanmamed MJ, Calderón C. Investigación Cualitativa en Atención Primaria. En: Martín Zurro A, Cano Pérez JF. Atención Primaria. 5ª ed. Barcelona: Hancourt Internacional; 2003.

## Internet Sources

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<http://www.easp.es/explora/evidencia/>  
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