

Scientific Methodology and Biostatistics

Code: 106104
ECTS Credits: 6

2025/2026

Degree	Type	Year
Nursing	FB	1

Contact

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Teachers

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Teaching groups languages

You can view this information at the [end](#) of this document.

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

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.

- Base nursing interventions on scientific evidence and the available media.
- Demonstrate knowledge of health information systems.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Use scientific methodology in interventions.

Learning Outcomes

1. Analyse the problems, prejudices and discrimination in the short and long term in relation to certain people or groups.
2. Critically analyse the principles and values that regulate the exercising of the nursing profession.
3. Demonstrate skills in bibliographical searches.
4. Describe the characteristics of the main information systems.
5. Describe the concepts of science, scientific research and the scientific method.
6. Describe the ethical principles involved in nursing research.
7. Draw up research questions based on scientific evidence.
8. Identify elements that belong to the research process.
9. Identify the different research methods in the health sciences.
10. Identify the need to research and use scientific evidence in care.
11. Interpret statistical and qualitative data and their possible repercussions in clinical practice.
12. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.

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 both.
3. Research process: Relationships between the scientific method, the research process and a scientific article.
4. Research problem and hypothesis formulation.
5. Review and bibliographic search.
6. Study design.
7. Sample and Population.
8. Methods of data collection.
9. Evaluation of scientific articles: internal validity and external validity.
10. Evidence Based Nursing. Gender-sensitive research
11. General concepts of statistics: basic terminology of research and statistics. Principles of the measure
12. Recollection, tabulation and graphic presentation of results. Basic principles of descriptive inferential statistics.
13. Handling of statistical data files.
14. Presentation and interpretation of results in scientific articles

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
CLASSROOM PRACTICES	10	0.4	2, 1, 3, 6, 7, 8, 10, 11, 12

LABORATORY PRACTICES	17	0.68	3, 4, 7, 12
SEMINARS	10	0.4	2, 1, 5, 6, 7, 8, 9, 10, 12
THEORY	28	1.12	2, 1, 5, 4, 6, 7, 8, 9, 10, 11, 12
Type: Supervised			
TUTORIALS	1	0.04	2, 6, 7, 8, 9, 10, 11, 12
Type: Autonomous			
Self study	76	3.04	3, 5, 4, 7, 8, 9, 10, 11

The learning methodologies are the backbone for the achievement of both theoretical content and skills involved in reflective-critical thinking when solving nursing problems based on the scientific method. The following is a brief description of each learning methodology

In Theory, necessary theoretical contents of the scientific methodology and the biostatistics will be taught.

In the seminars (SEM) the students will work in small groups. They will be introduced to the critical and reflective reading of original articles in the field of nursing and/or health sciences. As an example look at the [Impacto en la salud del programa de intervención comunitaria «Educación para la salud en la adolescencia»](#). These seminars will help to identify and discuss about real examples (original/scientific articles) the theory previously done. The original articles reflect the results of some of the nursing interventions. The critical reading of those articles will guide the nursing decision making based on the scientific method.

The laboratory practices (Plab) belong to the two blocks: 17h where quantitative data will be analyzed with analysis software, their interpretation will be performed and it will be shown how to present the results in the scientific environment. Also, searches for information in scientific databases will be carried out prior planning. The two four-hour PLABs that belong to the biostatistics block are mandatory. Failure to attend one of these PLAB without valid justification (see valid and invalid concepts in the guide on the rescheduling of tests to the UDCMB: https://www.uab.cat/doc/doc_guia_reprogramacio) will result in the loss of one third of the maximum total grade of the Biostatistics work (i.e. 0.5 points on the total grade of the subject). Failure to attend the two PLAB will result in the loss of the entire grade for the Biostatistics paper (i.e., 1.5 points of the total grade for the subject).

The classroom practices (PAUL) will work on concepts associated with both scientific methodology and biostatistics.

- PAUL of scientific methodology will be used to perform in situ a literature review to decide the best nursing intervention to solve a health problem. This literature review will be delivered in one of the research dissemination formats. A PAUL methodology will guide the writing and development of each of the corresponding parts of a literature review. The research problem will be previously defined from the coordination of the subject and will be the same for all first year students. A PAUL of methodology will be worked in the same small groups that previously have been made to the seminars. These PAUL are not mandatory but, in the case of problems to the group work the person/s who do not comply with the tasks assigned by the group will do individually the literature review.
- The biostatistics PAUL will be dedicated to the formalization of the biostatistics work and is mandatory. Failure to attend this PAUL without valid justification (see valid and invalid concepts in the guide on the rescheduling of tests to the UDCMB: https://www.uab.cat/doc/doc_guia_reprogramacio), will result in the loss of one third of the maximum total grade of the Biostatistics paper (i.e. 0.5 points on the total grade of the subject).

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation by submitting written works	30%	2	0.08	2, 1, 3, 5, 6, 7, 8, 10, 11, 12
Objective written test evaluations (Biostatistics)	35%	3	0.12	1, 5, 6, 7, 8, 9, 10, 11, 12
Objective written test evaluations (Scientific methodology)	35%	3	0.12	1, 3, 5, 4, 6, 7, 8, 9, 10, 11, 12

ONGOING EVALUATION

All the evaluation activities are compulsory, in case of not presenting it will be graded as Not Evaluable (NA) and will be quantified as zero (0). The evaluation of the subject is structured as follows:

1. (OE1) Objective test (scientific methodology exam): multiple-choice test: 35%.
2. (OE2) Objective test (Biostatistics exam): multiple-choice test: 35%.
3. (OE3) Submission of literature review (Scientific methodology): 15%.
4. (OE4) Submission of written works_data analysis (Biostatistics): 15%.

The final mark of the course is the weighting of the 4 ongoing assessment tests. In order to pass the course a minimum of 5.0 in the final grade is required. If the ongoing assessment is failed, the student may sit the retake exam. It must be taken into account that, according to general regulations, in order to take part in the final exam, students must have been previously assessed in a set of activities whose weight is equivalent to a minimum of two thirds of the total grade of the subject. This retake exam will include the entire syllabus of the failed assessment test.

Use of IA:

The use of Artificial Intelligence technologies (IA) for this subject is allowed exclusively in support tasks such as proofreading or translations or audiovisual support. The use of IA in support tasks such as bibliographic or information search or any other knowledge generation task is prohibited. The student will have to clearly identify which parts have been generated with this technology, specify the tools used, include a critical reflection on how these have influenced the process and the final result of the activity and reference them (as specified in Bibliography). The non-transparency of the use of IA in this evaluable activity will be considered academic dishonesty and may result in a total penalty in the grade of the activity, or higher penalties in serious cases.

Retake:

1. Any student who has taken at least two thirds of the total grade of the subject is entitled to retake the exam.
2. The final mark will be the result of the weighting of the retake tests with the continuous assessment tests passed.
3. In order to pass the course having taken a recovery test, it is necessary to obtain a minimum of 5.0 in the final mark.

Definition of NOT ASSESSABLE (NA): it will be understood as Not Assessable (NA) that situation in which the student does NOT present 50% or more of the evaluation activities.

Test Review: all students have the right to review the evaluation tests by appointment with the corresponding teacher. Thereview will consist of an individual tutoring session in which students will receive feedback regarding their evaluation.

The treatment of particular cases will be made from a teaching committee (formed by the subject coordinator, and 2 of the teachers of the same, 1 from each department involved) where the particular situation of each student will be evaluated and the most appropriate decisions will be taken.

ONE-TIME EVALUATION:

Students who wish to add to the single evaluation must do so following the deadlines established by academic management. The same day of the single evaluation will be evaluated the whole course with its corresponding evaluation activities. One-time evaluation will be a multiple-choice test with the following content:

- questions related to the overall content of the subject (scientific methodology and biostatistics), as well as the contents of laboratory and classroom practices.
- questions on the critical reading of an original article. This original article will be made available to students via Moodle and must be printed out on the day of the evaluation. As an example, look at the health [Impacto en la salud del programa de intervención comunitaria «Educación para la salud en la adolescencia»](#)

The final mark of the single evaluation is the mark of the multiple-choice test.. In order to pass the subject with One-time evaluation it is necessary to obtain a minimum of 5.0 in the final grade.

Definition of NOT ASSESSABLE (NA): Not Assessable shall be understood as the situation in which the student does NOT sit for the single evaluation exam.

The retake of the one-time evaluation takes place on the same day as the retake of the ongoing evaluation. In the retake exam, the student is assessed on the failed test/s. The number of exams and structure will be the same as for the one-time evaluation. The calculation of the final mark for the subject follows the same criteria.

The review of the final score (including that of the retake) follows the same procedures as for the ongoing evaluation.

Bibliography

Selected references:

1. Albert Navarro Giné, Sergio Salas Nicás. *Iniciación a la bioestadística para enfermería y otras profesiones sanitarias*. Bellaterra: Universitat Autònoma de Barcelona, Servei de Publicacions, 2021.
2. Josep M. Argimon Pallás, Josep Jiménez Villa. *Métodos de investigación clínica y epidemiológica*. 5^a ed. Barcelona: Elsevier, España, SA, 2019.
3. Susan K. Grove, Jennifer R. Gray, Nancy Burns. *Investigación en enfermería. Desarrollo de la práctica enfermera basada en la evidencia*. Madrid. Elsevier. 6a ed. 2019
4. Bee, P.; Brooks, H.; Callaghan, P. and Lovell. K. *A research handbook for patients and public involvement*. Manchester, Manchester University Press, 2018.
5. Denise F. Polit, Cheryl Tatano Beck. *Essentials of nursing research: Appraising Evidence for Nursing Practice*. Philadelphia : Wolters Kluwer/Lippincott/Williams & Wilkins Health. 8th ed. 2018

Referral bibliography:

1. Nancy Burns, Susan K. Grove. *Investigación en enfermería*. Madrid. Elsevier 5a ed. 2016.
2. Wayne W. Daniel. *Bioestadística: base para el análisis de las ciencias de la salud*. México: Limusa, 2002.
3. Erik Cobo, Pilar Muñoz, José Antonio González. *Bioestadística para no estadísticos: principios para interpretar un estudio científico* P. González JA. Barcelona: Elsevier Masson, 2007.

Citing AI use: Since some use of AI is allowed, AI must be cited. To know how to cite it see [Citar y elaborar Bibliografías. Estilos bibliográficos: COMO CITAR INTELIGENCIA ARTIFICIAL \(IA\)](#). Reading [Por qué ChatGPT no puede firmar artículos científicos](#). Javier Palanca.

Internet Sources

1. <https://doaj.org/>
2. <http://www.ncbi.nlm.nih.gov/pubmed>
3. <http://www.scopus.com/home.url>
4. <http://www.easp.es/exploraevidencia/>
5. <http://www.fisterra.com/>

Software

The Jamovi statistics program is used in the biostatistics laboratory practices.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	101	Catalan	second semester	morning-mixed
(PAUL) Classroom practices	102	Catalan	second semester	morning-mixed
(PAUL) Classroom practices	103	Catalan	second semester	morning-mixed
(PAUL) Classroom practices	104	Catalan	second semester	morning-mixed
(PAUL) Classroom practices	105	Catalan	second semester	afternoon
(PAUL) Classroom practices	106	Catalan	second semester	afternoon
(PLAB) Practical laboratories	101	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	102	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	103	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	104	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	105	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	106	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	107	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	108	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	109	Catalan	second semester	afternoon
(PLAB) Practical laboratories	110	Catalan	second semester	afternoon

(PLAB) Practical laboratories	111	Catalan	second semester	afternoon
(PLAB) Practical laboratories	112	Catalan	second semester	afternoon
(SEM) Seminars	101	Catalan	second semester	morning-mixed
(SEM) Seminars	102	Catalan	second semester	morning-mixed
(SEM) Seminars	103	Catalan	second semester	morning-mixed
(SEM) Seminars	104	Catalan	second semester	morning-mixed
(SEM) Seminars	105	Catalan	second semester	morning-mixed
(SEM) Seminars	106	Catalan	second semester	morning-mixed
(SEM) Seminars	107	Catalan	second semester	morning-mixed
(SEM) Seminars	108	Catalan	second semester	morning-mixed
(SEM) Seminars	109	Catalan	second semester	afternoon
(SEM) Seminars	110	Catalan	second semester	afternoon
(SEM) Seminars	111	Catalan	second semester	afternoon
(SEM) Seminars	112	Catalan	second semester	afternoon
(TE) Theory	101	Catalan	second semester	morning-mixed
(TE) Theory	102	Catalan	second semester	morning-mixed
(TE) Theory	103	Catalan	second semester	afternoon