Teaching Guide of the subject Year 2025 - 2026

SCIENTIFIC METHODOLOGY AND BIOSTATISTICS

Code: 106104
ECTS credits: 6

Titulation	*Type*	*Course*	*Semester*
2500891 Nursing	**FB**	**1**	**2**

Contact	*Use of languages*
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Prerequisites

There are no official prerequisites.

Contextualization and objectives

This subject is part of the Basic Sciences training module, Statistics subject and is planned in the second semester of the Bachelor's Degree in Nursing.

Research in health sciences involves researching, reviewing, and updating new knowledge to ensure adequate and quality care. To generate valid knowledge for each discipline, it is essential to follow a systematic methodology such as scientific methodology and become aware of one's own disciplinary knowledge.

The purpose of this subject is for the student to understand the importance of nursing research and to acquire the most important concepts in methodology and statistics, highlighting the applicability and transversal nature of the contents of the subject.

Learning objectives of the subject

1. Identify the most important points in an investigation.
2. Interpret a qualitative study.
3. Interpret a quantitative study.

Competencies and learning outcomes

Competence	Learning Outcomes
SPECIFIC	
E06. Base nursing interventions on scientific evidence and available means...	**E06.01** Identify the need to investigate and use scientific evidence in care. **E06.02** Interpret statistical and qualitative data and their possible repercussions on clinical practice. **E06.03** Identify the different research methods in health sciences. **E06.04** Formulate research questions based on scientific evidence.
E16. Demonstrate knowledge of health information systems.	**E16.01** Describe the characteristics of the main information systems. **E16.02** Demonstrate Skills in bibliographic research.
E.20 Use scientific methodology in their interventions.	**E20.01** Describe the concepts of science, scientific research and the scientific method. **E20.02** Identify elements of the research process.
GENERAL / BASIC	
G03. Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.	**G03.02** Critically analyze the principles and values that govern the practice of the nursing profession. **G03.03** Analyse difficulties, prejudices and discrimination, in the short or long term, in relation to certain people or groups. **G03.06** Explain the ethical principles involved in nursing research.
B03. Students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant social, scientific, or ethical issues.	

Content

MODULE I. SCIENTIFIC METHODOLOGY

Paradigms and types of research

1. Concept of scientific research and scientific method.
2. Paradigms in Health Sciences.
3. Introduction to qualitative and quantitative methodology.
4. Evidence-based nursing.
5. Ethical aspects of research.

Qualitative methodology

1. Characteristics of the qualitative methodology.
2. Formulation of the study question, objectives and hypotheses.
3. Bibliographic search.
4. Study design.
5. Population and sample.
6. Data collection and data analysis techniques.
7. Interpretation of results of scientific studies.
8. Critical reading.
9. Scientific dissemination.

Quantitative methodology

1. Characteristics of the quantitative methodology.
2. Formulation of the study question, objectives and hypotheses.
3. Study design.
4. Population and sample.
5. Variables
6. Data collection and data analysis techniques.
7. Scientific dissemination.

MODULE II. BIOSTATISTICS

1. Main concepts of statistics.
2. Descriptive statistics.
3. Statistical inference.
4. Interval estimation.
5. Hypothesis testing.
6. Presentation of the results.
7. Interpretation of results of scientific studies.

Methodology

The methodological approach of the subject is based on considering that each student is the protagonist in the teaching and learning process. Students must be active and autonomous throughout the process and teachers must support them, providing the information and resources necessary for learning to take place.

Directed activity:

The subject is face-to-face with recommended attendance. Expository, participatory and group methodology is used, developing active listening and exposure.

Supervised activity:

Different articles and documents are worked on. Tutorials can be face-to-face or electronic. Tutored group work is carried out in small groups of 5-7 students.

Training activities

Activity	Hours	ECTS	Learning Outcomes
Types: Directed . Theory (TE) . Classroom Internship (PAUL)	45	1,8	*E06.01; E06.02; E06.03; E06.04 E16.01; E16.02; E20.01; E20.02 B03 G03.02; G03.03; G03.06*
Types: Supervised . Tutorials	1	0.04	*E06.01; E06.02; E06.03; E06.04 E16.01; E16.02; E20.01; E20.02 B03 G03.02; G03.03; G03.06*
Type: Self-employed: . Bibliographic consultations and documents. . Reading articles/reports of interest.	90	3,60	*E06.01; E06.02; E06.03; E06.04 E16.01; E16.02; E20.01; E20.02 B03 G03.02; G03.03; G03.06*

The teaching staff will allocate approximately 15 minutes once the subject is finished to allow them to students can answer the assessment surveys on the teaching performance and the subject.

Evaluation

Continuous evaluation

The final grade of the subject is obtained from the arithmetic average of the marks obtained in the sum of the following sections:

- **Written group work in Module I (25%).**
- **Oral defense of the group work of Module I (5%).**
- **Written test in Module I (30%).**
- **Written test in Module II (40%).**

To be able to do average, a grade equal to or greater than 5 out of 10 must be obtained in each of the tests (tests, work and defense).

In the multiple-choice written test (multiple-choice questions), the negative answers are according to the following formula: x = correct answers – (errors / k-1), where *k* is the number of answer options. Thus, in the most frequent type of examination of 5 possible options (A, B, C, D or E), each item answered incorrectly, subtracts 0.25 items answered correctly; therefore 4 errors subtract a correct answer.
The results of the evaluation tests will be retroacted through the classroom and tutorials where appropriate.
The work evaluation rubric is available in the virtual classroom.

Qualification

- 0 to 4.9: Fail
- 5.0 to 6.9: Pass
- 7.0 to 8.9: Remarkable
- 9.0 to 10: Excellent (in the event that the student has obtained a grade equal to or higher than 9, he/she may opt, at the discretion of the teacher, for an honors).

Unique assessment

1. In this subject there is no homework scheduled to be done in a group.

2. The date of the unique test will coincide with the date of the last continuous assessment test that appears in the daily schedule and in the calendar of training and evaluation activities.

3. The unique assessment will consist of:
    1. Test 1, which will consist of an **individual written assignment** and weights **30%.**
    2. Test 2 which will consist of the **oral defence of the individual work** and weighs a **10 %.**
    3. Test 3 which will consist of a **written test Module I** and weights **30%.**
    4. Test 4 which will consist of a **written test Module II** and weights **30%.**

To be able to do average, a grade equal to or greater than 5 out of 10 must be obtained in each of the tests (tests, work and defence).

Recovery activity

1. A unique date is set for the retake activity of the written tests for all students, whether or not they are eligible for a unique assessment.
2. A remedial activity is proposed to students who have been previously evaluated for a set of activities whose minimum weight is equivalent to 2/3 of the total grade of the subject and who have obtained a final grade of less than 5 and higher than 3.5.
3. This test will consist of an evaluation activity of the test(s) not passed.
4. The remedial tests will be determined by the teaching staff.
5. The teacher may exclude from the recovery process those activities that, by their nature, he/she considers not to be recoverable.
6. In the event that the student passes the retake test corresponding to the failed part, the maximum grade of the same will be a 5.
7. The retake grade will replace the grade originally obtained and the final weighted grade will be recalculated.
8. Once the subject has been passed, it may not be subject to a new evaluation.

Not assessable

It is considered that the subject will not be assessable at the time that one of these circumstances is met:

1. Not having submitted any continuous assessment activity provided for in the teaching guide.
2. Not have attended any of the practical or compulsory sessions, when these are necessary to assess specific competences and this is indicated in the teaching guide.
3. Not having taken the final test (exam, written or oral test, job defence, etc.), if this represents an essential percentage of the qualification.
4. Not having completed the minimum required participation in training activities (e.g. seminars, presentations, forums, etc.), when these are part of the assessment.
5. Not having submitted the final work or compulsory project, if this constitutes central evidence of the learning of the subject.

Exam Review

Once the final grade has been published, the student can request a review of the retake test within the established period. Requests for revision are not accepted on dates outside this period.

Procedure in case of copying/plagiarism

1. Copying **or plagiarism** in any type of assessment activity is a crime, and will be penalised with a 0 as the grade of the subject, losing the possibility of recovering it, whether it is an individual or group work (in this case, all members of the group will have a 0).
2. If during the completion of an individual project in class, the teacher considers that a student is trying to copy or is discovered some type of document or device not authorised by the teaching staff, it will be graded with a 0, with no retake option, and therefore, the subject will be suspended.
3. A work, activity or exam is considered to be "copied" when it reproduces all or a significant part of the work of oneself or another classmate.
4. A work or activity will be considered "plagiarized" when a part of a text by an author is presented as one's own without citing the sources, regardless of whether the original sources are on paper or in digital format.

The use of Artificial Intelligence (AI) technologies

The use of Artificial Intelligence (AI) technologies is regulated according to the type of work to be performed:

1. In the event that the work aims at personal reflection and meaningful learning by the student, **the use of AI technologies is prohibited** in any of its phases of realization. Any work that includes AI-generated fragments (e.g., summaries, translations, text writing or image creation) is considered academic dishonesty and may lead to a partial or total penalty in the grade of the activity, as well as greater sanctions in cases of severity.

2. In other jobs, **the restricted use of AI technologies is allowed** only in those support tasks, such as bibliographic or information search, text correction, translations and other specific situations that are indicated. In these cases, the student will have to clearly identify which parts have been generated with this technology, specify the tools used and include a critical reflection on how these have influenced the process and the final result of the activity. The non-transparency of the use of AI in this assessable activity will be considered a lack of academic honesty and may lead to a partial or total penalty in the grade of the activity, as well as greater sanctions in cases of severity.

In any case, in the description of each work, the teacher in charge will clearly indicate **whether the prohibited or restricted use of AI applies.**

Aspects of assessment related to values and attitudes

1. The teacher may reduce the grade of the subject by between 1 and 2 points when the student repeatedly does not respect the indications of behavior in the classroom and/or disturbs the normal functioning of the classroom.
2. "No disrespect for colleagues or teachers will be tolerated. Homophobic, sexist or racist attitudes will not be tolerated either. Any student in whom any of the attitudes described above are detected will be classified as failing the subject."

Formal aspects of written work

In all activities (individual and group) linguistic correctness, writing and formal aspects of presentation will be considered.

Other considerations

1. All the evaluation tests will be published in the daily program and in the calendar of the training and evaluation activities.

2. The date of the unique test will coincide with the date of the last continuous assessment test.

3. Students who repeat the subject may request at the beginning of the academic year to take only a final synthesis assessment (Article 117, page 46 of the Academic Regulations of the Universitat Autònoma de Barcelona (Approved by agreement of the Governing Council of 7 July 2022, and amended by agreement of the Governing Council of 1 February 2023).

   Students in the second or higher enrolment who have taken all the assessment tests the previous year may choose to take assessment with a single synthesis assessment activity. This activity will consist of an exam at the end of the subject coinciding with the written exam of the subject. Students in the second or higher enrolment who wish to opt for the synthesis exam must notify the teaching staff responsible for the subject in writing two weeks before the published date.

Evaluation activities

Activities	Weight	Hours	ECTS	Learning Outcomes
Written Assignment	***40%***	3,5	0,14	*E06.01; E06.02; E06.03; E06.04 E16.01; E16.02; E20.01; E20.02 B03 G03.02; G03.03; G03.06*
Written work	*30%*			
Oral defense	*10%*			
Written assessment MODULE I : objective test	***30%***	2	0,08	*E06.01; E06.02; E06.03; E06.04, E16.01; E16.02; E20.01; E20.02 B03 G03.02; G03.03; G03.06*
Written assessment MODULE II: objective test	***30%***	2	0,08	*E06.01; E06.02; E06.03; E06.04, E16.01; E16.02; E20.01; E20.02 B03 G03.02; G03.03; G03.06*

Bibliography

Books:

Investigación en enfermería : desarrollo de la práctica enfermera basada en la evidencia
Autors: Susan K. Grove, Jennifer R. Gray
Edició: Elsevier 2019 (7ª)
ISBN: 9788491135111

Investigación en enfermería
Autors: Burns N, Grove S.
Edició: Elsevier 2012 (5a)
ISBN: 8481745170

Métodos de investigación clínica y epidemiológica
Autors: Argimon Pallás JM, Jiménez Villa J
Edició: Elsevier, 2013 (4ª)
ISBN: 9788480869416

Essentials of Nursing Research: Appraising Evidence for Nursing Practice
Autors: Polit DF, Beck CT
Edició: Philadelphia, Pa. ; Lippincott Williams & Wilkins, 2014 (8a)
ISBN: 9781451176803

Investigació científica en ciències de la salut
Autors: Polit D, Hungler B.
Edició: Madrid Interamericana Mc Graw-Hill, 2000 6ª
ISBN: 9789701026908

Iniciación a la bioestadística para enfermería y otras profesiones sanitarias
Autors: Albert Navarro, Sergio Salas.
Edició: Servei de Publicacions de la Universitat Autònoma de Barcelona, 2021
ISBN: 8449094259

Fundamentos de estadística en ciencias de la salud
Autors: Miguel Martín, Olivia Horna, Fúlvio B. Nedel, Albert Navarro.
Edició: Servei de publicacions Universitat Autònoma de Barcelona, 2010.
ISBN: 9788449026324

Bioestadística para no estadísticos: principios para interpretar un estudio científico
Autors: Erik Cobo, Pilar Muñoz, José Antonio González.
Edició: Elsevier Doyma S.L., 2007.
ISBN: 9788445817827

Escuchar, observar y comprender. Recuperando la narrativa en las Ciencias de la Salud. Aportaciones de la investigación cualitativa.
Autors: Berenguera A, Fernández de Sanmamed MJ, Pons M, Pujol E, Rodríguez D, Saura S.
Edició: Institut Universitari d'Investigació en Atenció Primària Jordi Gol (IDIAP J. Gol), 2014 (1a)

Webography:

Fisterra
https://www.fisterra.com/formacion/metodologia-investigacion/

Carlos III Health Institute
https://bncs.isciii.es/recursos-informacion

Andalusian School of Public Health:
https://easp.es/exploraevidencia/

Teaching platforms

- Moodle