Universidad de Navarra

Applied Research Methodology II

Guía docente 2025-26

INTRODUCTION

Brief description:

The course covers the main methodological aspects of biomedical research. To this end, it will integrate a step-by-step guide to do research, develop skills of writing and communicating a research work as well as practical tips for searching and organizing the information. There will be 12 workshops distributed over the 3 trimesters.

- **Degree**: Grado en Medicina
- **Module and topic of the course**: II Social Medicine, Communication Skills & Introduction to Research; 2.2 Research in Biomedicine
- **ECTS**: 3
- **Year, semester**: 5th year, annual
- **Course's character**: Mandatory
- **Responsible faculty**: Dr. Amaia Rodríguez, Associate professor (arodmur@unav.es)
- **Other faculty**:
- Prof. Gema Frühbeck, Full professor, (gfruhbeck@unav.es)
- Dr. Javier Gómez Ambrosi, Associate professor, (jagomez@unav.es)
- Dr. Victoria Catalán, Assistant professor, (vcatalan@unav.es)
- Dr. Sara Becerril, Assistant professor (sbecman@external.unav.es)
- **Language**: English
- **Classroom, schedule**: Mondays at **Aula 4B04** (first trimester) **and 3B04** (second and third trimester) (Edificio de Ciencias, Hexágono), **15:00-17:00.**

LEARNING OUTCOMES (Competencies)

A. BASIC COMPETENCES

CB1 - That students have demonstrated knowledge and understanding in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.

CB2 - That students know how to apply their knowledge to their work or vocation in a professional manner and possess the competencies that are usually demonstrated through the development and defense of arguments and problem solving within their field of study.

CB3 - That 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.

CB4 - Students will be able to transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.

CB5 - That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

B. GENERAL COMPETENCES

CG28 - Obtain and use epidemiological data and assess trends and risks for health decision making.

CG31 - Know, critically evaluate and know how to use clinical and biomedical information sources to obtain, organize, interpret and communicate scientific and health information.

CG32 - Know how to use information and communication technologies in clinical, therapeutic, preventive and research activities.

CG34 - To have a critical, creative, constructive skeptical and research-oriented point of view in professional activity.

CG35 - Understand the importance and limitations of scientific thinking in the study, prevention and management of diseases.

CG36 - Be able to formulate hypotheses, collect and critically evaluate information for problem solving, following the scientific method.

CG37 - To acquire the basic training for research activity.

CG38 - Be able to function in international scientific and clinical settings to participate in translational research in the field of biomedicine.

C. SPECIFIC COMPETENCES

MORPHOLOGY, FUNCTION AND STRUCTURE OF THE HUMAN BODY

SC37 - Knowing the principles and methods of preventive medicine and public health.

SC38 - Risk factors and disease prevention.

SC39 - Recognize the determinants of health of the population. Health indicators.

SC40 - Planning, programming and evaluation of health programs.

SC41 - Prevention and protection against diseases, injuries and accidents.

SC42 - Evaluation of the quality of care and patient safety strategies.

SC43 - Vaccines.

SD44 - Epidemiology.

SC45 - Demography.

SC51 - Knowing, critically assessing and knowing how to use the technologies and sources of clinical and biomedical information to obtain, organize, interpret and communicate clinical, scientific and health information.

CE52 - Knowing the basic concepts of biostatistics and its application to medical sciences. To be able to design and perform simple statistical studies using computer programs and interpret the results.

SC53 - Understand and interpret statistical data in the medical literature.

SC54 - Knowing the history of health and disease.

SC57 - Use biomedical information search and retrieval systems.

SC58 - Know and manage clinical documentation procedures.

SC59 - Understand and critically interpret scientific texts.

SC60 - Know the principles of the scientific method, biomedical research and clinical trials.

SC61 - Know the principles of telemedicine.

SC62 - Knowing and managing the principles of (best) evidence-based medicine.

CE66 - Make an oral and written public presentation of scientific work and/or professional reports.

PROGRAMME

A. RESEARCH PROJECT PROPOSAL

Date	Room	Workshop	Teacher
1 September	4B04	Develop research questions and background information	Dra. Amaia Rodríguez Dra. Sara Becerril
15 September	4B04	Search background information and bibliography	Dra. Victoria Catalán Dra. Sara Becerril
29 September	4B04	Experimental design: population, sample size, and methodology	Dra. Victoria Catalán Dr. Javier Gómez-Ambrosi
13 October	4B04	Writing a manuscript: topic and structure	Prof. Gema Frühbeck Dr. Javier Gómez-Ambrosi

B. COMMUNICATION OF RESEARCH FINDINGS

Date	Room	Workshop	Teacher

24 November	3B04	Writing an abstract	Dr. Javier Gómez-Ambrosi Dra. Victoria Catalán
1 December	3B04	Poster presentation	Dra. Amaia Rodríguez
19 January	3B04	Slide preparation for oral communications	Dra. Sara Becerril
26 January	3B04	Strategies for oral communications	Dra. Sara Becerril Dra. Amaia Rodríguez

C. TOOLS FOR RESEARCH DISSEMINATION AND MANAGEMENT

Date	Room	Workshop	Teacher
23 February	Aula 2, Edificio Los Castaños	Communicating science: journals and congresses to present the research work	Prof. Gema Frühbeck Gabriela Neira
16 March	3B04	Bibliometric analysis	Dr. Javier Gómez-Ambrosi Dra. Victoria Catalán
23 March	3B04	Artificial intelligence: concepts	Dra. Amaia Rodríguez
20 April	3B04	Artificial intelligence: applications	Dra. Amaia Rodríguez

FORMATION ACTIVITIES

The workshops will have a first theoretical part, followed by a second practical individual part to be developed by the student that will be delivered in ADI at the end of the workshop. Exceptionally, if the activity requires it and the teacher in charge of the workshop allows it, it can be delivered within one week.

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Workshops: 24 h

Personal work: 51h

EVALUATION

ORDINARY CALL

At the end of each trimester, a liberatory test of 40 questions will be carried out counting negative -0.33 and liberating from 7.

The activity of each workshop will be evaluated over 10 (4 activities per trimester)

Trimester mark:

60% test and 40% workshops. Only for those students that have approved the liberatory test.

Dates for partial liberatory exams:

Partial 1, first trimester: **3 November**, 13:00-14:00 h.

Partial 2, second trimester: **9 February**, 13:00-14:00 h.

Partial 3, third trimester: **4 May**, 13:00-14:00 h.

Final exam for those that have not approved the liberatory trimester tests or those who want to improve their marks. One week before the exam, those who want to improve their marks must notify it by email, specifying the trimester block(s) they want to improve. Those with non-approved liberatory test(s) must be only presented in the non-approved trimester block. A minimum of 5/10 in the final exam will be necessary to obtain a mark in the workshops. Wrong answers count negative -0.33.

The final mark is calculated as the arithmetic average of the three trimesters, whether obtained in the trimester itself or in the final exam.

Students with special educational needs must contact the Study Coordinator of the School of Medicine in advance to obtain authorization for any required accommodations (e.g., additional time for exams). This authorization must be forwarded by the student to the course professor. It is recommended that this process be completed at the beginning of the semester.

IMPORTANT: Any attempt at fraud, copying, plagiarism, or other irregular conduct constitutes a serious offense, as established in Title IV "*Normas de disciplina académica de los estudiantes*", within the Code of Conduct of the University of Navarra.

EXTRAORDINARY CALL

Final multiple choice exam of the whole course which requires a mark of 5/10 to be added to the mark of the activities delivered in the workshops. Wrong answers count negative -0.33.

HORARIO DE ATENCIÓN

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Dra. Amaia Rodríguez Murueta-Goyena

- Office 0010, CIFA Building. Floor 0.
- By arrangement (please e-mail: **arodmur@unav.es**)

BIBLIOGRAPHY AND RESOURCES

The bibliography and resources will be specifically provided prior to each workshop.

As a general framework, the following references can be used:

1. Subbiah V. *The next generation of evidence-based medicine.* Nat Med. 2023;29(1):49-58. DOI: 10.1038/s41591-022-02160-z
2. Forero DA, Lopez-Leon S, Perry G. *A brief guide to the science and art of writing manuscripts in biomedicine.* J Transl Med. 2020;18(1):425. DOI: 10.1186/s12967-020-02596-2
3. Bahadoran Z, Mirmiran P, Kashfi K, Ghasemi A. *The Principles of Biomedical Scientific Writing: Abstract and Keywords*. Int J Endocrinol Metab. 2020;18(1):e100159. DOI: 10.5812/ijem.100159
4. Seals DR. *Talking the talk: tips for effective oral presentations in biomedical research.* Am J Physiol Regul Integr Comp Physiol. 2022;323(4):R496-R511. DOI: 10.1152/ajpregu.00179.2022
5. Penders B. *Ten simple rules for responsible referencing*. PLoS Comput Biol. 2018;14(4): e1006036. DOI: 10.1371/journal.pcbi.1006036
6. Yu KH, Healey E, Leong TY, Kohane IS, Manrai AK. *Medical Artificial Intelligence and Human Values.* N Engl J Med 2024;390(20):1895-1904. DOI: 10.1056/NEJMra2214183
7. Kirchoff B. *How to tell a compelling story in scientific presentations*. Nature. 2021;600: S88-S9. DOI: 10.1038/d41586-021-03603-2.
8. Penders B. *Ten simple rules for responsible referencing*. PLoS Comput Biol. 2018;14(4): e1006036. DOI: 10.1371/journal.pcbi.1006036.
9. Mondal H, Deepak KK, Gupta M, Kumar R. *The h-Index: Understanding its predictors, significance, and criticism.* J Family Med Prim Care. 2023;12:2531-7. DOI: 10.4103/jfmpc.jfmpc_1613_23.
10. Yu KH, Healey E, Leong TY, Kohane IS, Manrai AK. *Medical Artificial Intelligence and Human Values.* N Engl J Med 2024;390(20):1895-1904. DOI: 10.1056/NEJMra2214183.