Project/Course teaching guide

Subject	TRENDS IN BIOMEDICAL RESEARCH		
Field	INVESTIGACIÓN BIOMÉDICA		
Module			
Degree	Grado en Biomedicina y Terapias Avanzadas		
Program	710	**Code**	47926
Teaching period	2º Quarter	**Type/Character**	Obligatory
Level/Cycle	Degree	**Curse**	Fourth
ECTS credit	3		
Language of instruction	Inglés		
Responsible Professor(s)	Lucía Núñez — CAUN nunezl@uva.es Margarita González–Vallinas — PAYUD mgvallinas@ibgm.uva.es Mar Infante — PAYUD mariamar.infante@uva.es Teresa Gallego — PRAS teresa.gallego.martin@uva.es Omar Motiño — Investigador omar.motino@uva.es		
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Department	Biochemistry and Molecular Biology and Physiology		
Date reviewed by the title committee	July 4th , 2024		

1. Course Situation / Purpose

1.1 Contextualization

The course "Trends in Biomedical Research" focuses on the latest advances in biomedical research. Once students have learned a substantial amount of information about biomedicine, this final course enables them to analyze and understand the most highly specialized findings in the field. This course is mandatory in the fourth year of the “Biomedicina y Terapias Avanzadas” degree and get the students ready to become outstanding researchers.

1.2 Relationship with Other Subjects

Trends in Biomedical Research is closely related to several subjects in the Degree of “Biomedicina y Terapias Avanzadas”, thus it is in the module of BIOMEDICAL RESEARCH. This subject will complete the learning project of the students. And will prepare the students to complete and present the bachelor's thesis.

1.3 Prerequisites

The requirements to enroll in the 4th-year courses of the Bachelor's Degree in “Biomedicina y Terapias Avanzadas”.

2. Competencies

2.1 Basic Competencies

• **CB2:** Students should know how to apply their knowledge professionally and possess the skills to develop and defend arguments and solve problems within their area of study.

• **CB3:** Students should be able to gather and interpret relevant data to make judgments that include reflections on social, scientific, or ethical issues.

• **CB4:** Students should be able to convey information, ideas, problems, and solutions to both specialized and non-specialized audiences.

• **CB5:** Students should have developed the necessary learning skills to undertake further studies with a high degree of autonomy.

2.2 General Competencies

• **CG1:** Analyze and synthesize basic problems related to Biomedicine and Advanced Therapies, solve them using the scientific method, and communicate them effectively.

• **CG3:** Resolve problems with initiative and creativity, and communicate and transmit knowledge, skills, and abilities, understanding the ethical, social, and professional responsibility of biomedical activities.

• **CG5:** Acquire, analyze, interpret, and manage information.

• **CG6:** Develop reports and make judgments based on critical analysis of reality.

• **CG9:** Draft, represent, and interpret scientific-technical documentation.

• **CG10:** Develop leadership, innovation, and entrepreneurial spirit.

2.2 Transversal Competencies

• **CT1:** Develop interpersonal communication skills and learn to work in multidisciplinary, multicultural, and international teams.

• **CT2:** Organize and plan work, making correct decisions based on available information to make judgments within the study area.

• **CT3:** Communicate knowledge orally and in writing to both specialized and non-specialized audiences.

• **CT4:** Identify and understand continuous advances and challenges in research.

• **CT5:** Develop self-learning skills and motivation for continuing education at the postgraduate level.

2.2 Specific Competencies

• **CE41:** Understand the main historical milestones of Biomedicine and Advanced Therapies and their influence on human societies, as well as the most innovative and recent developments in this field.

• **CE42:** Communicate proficiently in English, the universal language for scientific communication and information exchange.

• **CE43:** Develop skills for searching and analyzing relevant scientific information, interpreting it, and communicating it appropriately.

3. Objectives

- Critically understand and interpret scientific texts.
- Use clinical and biomedical technologies and information sources to search, process, and analyze scientific information.
- Critically evaluate scientific research in biomedicine from both scientific validity and ethical and social perspectives.
- Clearly communicate results, conclusions, and critiques related to scientific work to both specialized and non-specialized audiences in a second language (English).
- Understand the latest advances in biomedical research and their potential clinical applications.

4. Contents

a. Contextualization and Justification

The course "Trends in Biomedical Research" focuses on the latest advances in biomedical research. Once students have learned a substantial amount of information about biomedicine, this final course enables them to analyze and understand the most highly specialized findings in the field.

b. Learning Objectives

- Critically understand and interpret scientific texts.
- Use clinical and biomedical technologies and information sources.
- Critically evaluate scientific research in biomedicine.
- Clearly communicate scientific results, conclusions, and critiques.
- Understand the latest advances in biomedical research and their clinical potential.

c. Contents

Part 1. Introduction:

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1. Introduction to biomedical research: The Spanish Science and Technology system. Organizations, funding and executing agencies, research centers, centers of excellence, networked centers, units, research groups. Research career path. Bachelor, master, doctorate, postdoctoral research, excellence programs, access to research positions. Basic, clinical, and translational research (1.5 hours).

2. Critically interpreting scientific texts. The peer-review process. Scientific publications. Research projects. Doctoral theses. Master's thesis. Analysis of a research paper. Bibliometrics and software applications for result analysis (1 hour).

3. Scientific dissemination and communication. Conference communications include posters, oral presentations, symposia, seminars, courses, workshops, scientific dissemination. Result protection (0.5 hours).

4. Oral communication of scientific work. How to clearly communicate results to both specialized and non-specialized audiences (1 hour).

5. Main historical milestones in Biomedicine and Advanced Therapies and their influence on human societies, as well as the most innovative and recent developments in this field. (1h)

Part 2. Evaluations of the Biomedical Trends Scientific texts

Search and scientific evaluation of texts on the latest trends in biomedical research: European research projects, doctoral theses, and new scientific articles.

Part 3: "The Topic of the Year in Biomedicine"

Current topics in biomedical research will be selected, and students will choose scientific articles to be discussed and debated. Finally, students will prepare an oral presentation on the topic in groups. The possible topics to propose could be:

- Stem cells and regenerative medicine.
- Cancer immunotherapy: CAR T cells and other approaches
- CRISPR/Cas9 technology in gene therapy
- Exosomes.
- Secretome: Exosomes
- Senescence and autophagy
- Contribution of aging in disease development: geroscience
- New animal models in biomedical reseach
- Long COVID effects
- RNA biology
- Single cells multiomics analysis
- Medical Chemistry
- Computational biology
- Multidisciplinary aproach in reseach

Seminars and Laboratory Contents:

1. Laboratory practices in small groups supervised by a professor to evaluate a project or scientific article and prepare the corresponding report using software tools.

2. Laboratory practices where students in groups of 2 or 3, guided by a professor, select current topics in biomedical research that represent recent milestones in disease treatment. Students will read and analyze selected scientific articles.

3. Seminars where students individually or in groups prepare a PowerPoint presentation or similar, to present a scientific article. The presentation should include an introduction to the topic, explanation of results, conclusions, and future perspectives.

4. Articles will be presented in class by students, evaluated, and debated by the professor and other students. Students will have the opportunity to make a second presentation incorporating the feedback received.

d. Teaching Methods

- **Lectures:** In-person classes according to the scheduled timetable for the subject.
- **Laboratory practices:** In groups of 3-4 students, the practical content will be developed with the teacher's guidance.
- **Seminar Classes:** Critical reading and research presentation activities. Active participation in open discussions on presented topics will be encouraged. Telematic presentations will also be facilitated.

e. Work Plan

Five lectures on the Introduction content will be delivered over five weeks, one hour per week. Simultaneously, two hours per week will be dedicated to practices and seminars.

f. Evaluation

The final grade will be based on the written exam for Part 1 (30%), evaluation of the written report for Part 2 (20%), and oral presentations for Part 3 (50%).

g Teaching Material

g.1 Basic Bibliography

- Research methodology in the medical and biological sciences. Petter Laake, Haakon Benestad, Bjorn R. Olsen. Elsevier Science & Technology. 2007. ISBN: 978-0-12-373874-5.
- The Scientific Endeavor: A primer on scientific principles and practice. Jeffrey A. Lee. Benjamin Cummings. 1999. ISBN: 978-0805345964.
- Research Skills for Medical Students. Ann K. Allen. SAGE Publishing. 2012. ISBN: 9780857256010.
- Investigación para la salud. Manuel Jiménez Navarro. Ed. Panamericana. 2022. ISBN: 9788491108337

https://buc-uva.alma.exlibrisgroup.com/leganto/public/34BUC_UVA/lists/8244039590005774?auth=SAML

h. Required Resources

Access to the UVa Virtual Campus (Moodle platform). Telematic equipment in the classroom to enable remote access to classes. Students need to have their computers to work in the laboratories.

i. Timing

ECTS	DEVELOPMENT PERIOD
5T	11 February –18 March
10L	24 February – 24 March
15S	31 March –16 may

5. Teaching Methods and Methodological Principles

Lectures: the theory classes will consist of participative and open formats sessions, allowing students to engage their own learning by raising questions related to the subject taught.

Laboratory practices: The practices will take place in groups of 3-4 students where the practical content of the subject will be developed. The professor will supervise the work closely.

Seminar Classes: Critical Reading and Oral Presentation of the students. Active participation of all students will be encouraged in open discussions on the presented topics. Telematic presentations will also be facilitated.

6. Table of Student Dedication to the Subject

IN-PERSON or REMOTE SYNCHRONOUS (1)	HOURS	NON-PRESENTIAL ACTIVITIES	HOURS
Lectures	5	Study and independent work	10
Laboratory practices	10	Study and independent work	10
Seminar Classes (1)	15	Study and independent work	20
Total presential	**30**	Total non-presential	**35**
		TOTAL presential + non-presential	**65**

(1) Remote synchronous attendance is when a group follows a video conference synchronously with the class taught by the teacher

7. System and Evaluation Characteristics

INSTRUMENT/PROCEDURE	WEIGHT IN FINAL GRADE	COMMENTS
Part 1: Introduction	20 %	Written test and completion of quizzes on UVa Virtual Campus and submission of assignments
Part 2: Evaluations of scientific texts	20 %	Grading of the submission of assignments
Part 3: Oral presentation	50%	Evaluation of the oral presentations and the progression in the second presentation
Continuous assessment	10%	Completion of quizzes and submission of assignments

GRADING CRITERIA

• **Regular grading session:**
  ○ A minimum overall score of 5 (5/10) must be obtained to pass the course.
  ○ The assignments submission and the oral presentations are mandatory to pass the course
• **Extraordinary grading session (*):**
  ○ The criteria are the same as in the regular exam session. The continuous assessment exams are only considered if they are favorable.

(*) The extraordinary exam session refers to the second opportunity for examination.
Art 35.4 del ROA 35.4. La participación en la convocatoria extraordinaria no quedará sujeta a la asistencia a clase ni a la presencia en pruebas anteriores, salvo en los casos de prácticas externas, laboratorios u otras actividades cuya evaluación no fuera posible sin la previa realización de las mencionadas pruebas.
https://secretariageneral.uva.es/wp-content/uploads/VII.2.-Reglamento-de-Ordenacion-Academica.pdf

8. Final Considerations