Universidad Rey Juan Carlos

TEACHING GUIDE

EPIDEMIOLOGY AND HEALTH TECHNOLOGY ASSESSMENT

GRADO EN INGENIERÍA BIOMÉDICA (INGLÉS) (3º y 4º curso) (2374)

ACADEMIC YEAR 2026-27

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

Publication date: 02-07-2026

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

I.-Subject Identification	
Type	OPTATIVA
Teaching period	4 course, 2Q semester
Nº of credits	3
Language in wich the subject is taught	English

II.-Presentation

The main objectives of the course are that the student knows:
-General concepts of epidemiology, public health and demography.
-Design of the main epidemiological studies.
-The basic epidemiological concepts applied to communicable and chronic diseases.
-General concepts of the process of health technology assesment.
-The main methods for health technology assesment.

III.-Learning outcomes

CG01 . Analyze and synthesize problems related to biomedical engineering, solve them and communicate them efficiently.
CG02. Use computational and experimental tools for the analysis and quantification of biomedical engineering problems
CB2 . That students are able to apply their knowledge to their work or vocation in a professional manner and have the skills that are typically demonstrated through the preparation 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 field of study) to express judgments that include a reflection on relevant topics related to social, scientific or ethical areas.
CB5 . That students have developed the learning skills needed to undertake further studies with a considerable degree of autonomy.
CE05. Understand, use and design systems to support in the management of biomedical information and medical decision making.
CE25. Understand and implement healthcare projects and optimally use the results to review production processes.

- Key for degrees not adapted to RD 822/21: **CB** - basic competences, **CG** - generic competences, **CE** - specific competences, **CT** - transversal competences.
- Key for degrees adapted to RD 822/21: **CON** - knowledge, **COM** - competences, **HAB** - skills.

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

IV.-Contents

IV.A.-Syllabus

I - Epidemiology

I.I. INTRODUCTION TO PUBLIC HEALTH AND DEMOGRAPHY

1. Concept of public health.
2. Demographic concept and interrelationships with public health. Static and dynamic demographics.

I.II.-EPIDEMIOLOGICAL METHOD

3. Conceptual bases in epidemiology: concepts and applications.
4. Causality in epidemiology. Biases, confusion and interaction.
5. Measures of frequency in epidemiology.
6. Classification of epidemiological studies.
7. Descriptive epidemiology: cross-sectional and ecological designs.
8. Analytical epidemiology: case-control design.
9. Analytical epidemiology: cohort design.
10. Experimental or intervention designs. Clinical trials.
11. Validity Studies of a Diagnostic Test.

I.III. APPLIED EPIDEMIOLOGY

12. Epidemiology of communicable diseases. Epidemiological surveillance, epidemics, general concepts of immunoprophylaxis.
13. Epidemiology of non-communicable diseases.

II - Health Technology Assesment

II.I. STAGES OF THE HEALTH TECHNOLOGY ASSESMENT PROCESS

14. Identification and prioritization of technologies to be evaluated (from the drug to the new diagnostic procedures).
15. Definition of the objectives, level and perspective of the evaluation.
16. Review of current scientific evidence (classification of evidence, comparison of studies, meta-analysis).
17. Planning and development of evaluation studies.
18. Obtaining results and recommendations for decision-making.
19. Dissemination of evaluation results and use of evaluation.

II.II. METHODS FOR HEALTH TECHNOLOGY ASSESMENT

20. Systematic review of scientific evidence and grey literature.
21. Qualitative research techniques.
22. Quantitative evaluation of diagnostic tests (efficacy and effectiveness).
23. Evaluation of efficiency (minimization of costs, cost-effectiveness, cost-utility, cost-benefit).
24. Impact analysis (on the clinical process, on the patient's health, on equity, on acceptability).

IV.B.-Training activities

Type	Title
Lectures	Readings provided during the course
Theoretical sessions	Master classes
Resolution of exercises, problems, case studies	Completing exercises related to the course content.

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

Group work	Group work where the subject's content will be applied
Oral presentations	Oral presentation of coursework

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

V.-Student workload	
Theoretical sessions	20
Resolution of exercises, problems, case studies, etc.	10
Practical sessions in experimental, technological and clinical laboratories, fieldwork, etc.	0
Tests and/or exams	0
Academic tutorials	10
Related activities: conferences, seminars, etc.	14
Preparation of theoretical sessions and self-study	12
Preparation of practical tasks, exercises, case studies, projects, etc.	10
Preparation for tests and/or exams	14
Total student workload	90

VI.-Methodology and academic programme

Type	Period	Content
Theoretical sessions	Week 1 to Week 7	Theoretical lessons of Module I
Theoretical sessions	Week 8 to Week 15	Theoretical lessons of Module II
Practical sessions	Week 1 to Week 7	Practical excercices of Module I.
Practical sessions	Week 8 to Week 15	Practical excercices of Module II.

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

VII.-Assessment methods

The general assessment method is continuous as established in the *Regulation for the Assessment of Learning Outcomes* of Rey Juan Carlos University.
All the assessment systems established in the degree report must be employed, except for those that have a minimum weight of 0%, which can be used by professors in the academic years they consider relevant. Each assessment system may be applied through one or more assessment activities, consistent with the system. No assessment activity can exceed individually 60% of the overall grade for the subject.
The sum of non re-evaluable activities cannot exceed 40% of the overall grade for the subject and, in general, should not have an established minimum grade (except for practical activities in which, strictly speaking, the conditions of the ordinary call cannot be reproduced in the extraordinary call).
Those students who do not manage to pass the subject in the ordinary call, or do not attend this first call, may attend the extraordinary call only for failed re-evaluable assessment activities.
The distribution and characteristics of the assessment activities are described below.

VII.A.-Description and weight of the assessment activities

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

Class attendance in the subject is highly recommended. Students who, for some reason, cannot follow the subject, must request an academic dispensation through the administrative procedure authorized for this purpose, and contact the subject coordinator as soon as possible. The alternative itinerary will include the following sections:
• The student with a dispensation will have reading material of the theoretical foundations to support the contents seen in class.
• The student with a dispensation will have to attend the practices of the subject.

The final grade in the ordinary call will be the result of adding up:
• The theoretical exam of block I, (that will suppose a 30% of the final grade). Minimum grade 4.5.
• Evaluation of the practices of block I by means of work/memory (20%:). This part cannot be re-evaluated.
• The theoretical-practical examination of block II, (which will be 30% of the final grade). Minimum grade 4.5.
• Evaluation of the practices of block II means of work/memory (20%:). There will be 2 deliveries throughout the second module. This activity will contribute to the progressive evaluation of the understanding of concepts. This part cannot be re-evaluated.

In the extraordinary call, only the parts not passed in the ordinary call will be evaluated, and the weighting will be:
• 30%: Theoretical examination of block I.
• 30%: Theoretical and practical examination of block II.
• 20%: Grade of the practices of module I obtained in the ordinary call.
• 20%: Grade from the practices of module II obtained in the ordinary call.

Assessment Systems	Activity	Participation	Type	Minimum grade	Weighting	Period	Content
SE02	Block I written exam	Individual	Revaluable	4.5	30%	Regular and extraordinary assessment period	Written test related to the contents of block I
SE02	Block II written exam	Individual	Revaluable	4.5	30%	Regular and extraordinary assessment period	Written test related to the contents of block II
SE05	Practical work for Block I	Group	Non Revaluable	No	20%	Regular assessment period	Group work related to the syllabus for Block I
SE05	Practical work for Block II	Group	Non Revaluable	No	20%	Regular assessment period	Group work related to the syllabus for Block II

In the early evaluation call, only the parts not passed in the previous calls (ordinary and extraordinary) will be evaluated, and the weighting will be:
• 30%: Theoretical examination of module I.
• 30%: Theoretical and practical examination of module II.
• 20%: Grade of the practices of module I obtained in the ordinary or extraordinary calls. If the student has not passed the Block II practicals in the regular or extraordinary exam sessions, a similar practical assignment will be proposed to the student.
• 20%: Grade from the practices of module II obtained in the ordinary or extraordinary calls. If the student has not passed the Block II practicals in the regular or extraordinary exam sessions, a similar practical assignment will be proposed to the student.

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

VII.B. Assessment of students with academic exemption from class attendance

Having Academic Exemption from Class Attendance (DAAC) does not imply that students are automatically exempt from participating in the continuous assessment activities or in the training activities of compulsory attendance as established in the teaching guide. Once the exemption has been granted, students must contact the subject's teaching staff, who will propose the adaptations he/she may consider relevant, as long as they guarantee the acquisition and adequate assessment of the learning goals established. Students must maintain adequate communication with the teaching staff so that they may provide information on the dates for training and assessment activities, if these are not established in the programme and available for students at the time of achieving the exemption.
Subject with possibility of academic exemption: Yes.

VII.C. Review of assessment activities

In accordance with the Regulation for the Assessment of Learning Outcomes of Rey Juan Carlos University.

VII.D.-Students with a disability or special educational needs

In order to guarantee equal opportunities, non-discrimination, universal accessibility and academic success, students with disabilities or especial education needs may request curricular adaptations to follow their studies. These adaptations will be provided by the Unit of Attention to People with Disabilities of Rey Juan Carlos University, in accordance with the regulation which regulates the service for the Attention of People with Disabilities at the University. This Unit will issue a report for curricular adaptations, so that students with disabilities or special education needs must contact the service (at e-mail discapacidad.programa@urjc.es) in order to provide relevant information for different educational alternatives.

VII.E.-Academic behaviour, academic integrity and honesty

Rey Juan Carlos University is fully committed to the highest standards of academic integrity and honesty, so studying at the URJC means assuming and subscribing to the values of integrity and academic honesty set out in the University's Ethical Code. To support this process, the University has Rey Juan Carlos University's Academic Conduct Regulation as well as different tools (anti-plagiarism, supervision...) that offer a collective guarantee for the full development of these essential values.

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

VIII.-Teaching resources and materials
Basic bibliography
Module I: -Daniel Westreich. Epidemiology by design. A causal approach to the health sciences. Oxford University Press. 2020. Module II: Kristensen FB & Sigmund H (ed.) Health Technology Assessment Handbook. Copenhagen: Danish Centre for Health Technology Assessment, National Board of Health, 2007.
Consultation bibliography
Any text book of Basic epidemiology.- -Modern Epidemiology. Kenneth J. Rothman, Sander Greenland, Timothy L. Lash. Lippincott Williams &Wilkins, 2008 www.who.org www.cdc.gov www.mscbs.gob.es www.ecdc.eu TURNER, Sheila, et al. The health technology assessment adaptation toolkit: description and use. International journal of technology assessment in health care, 2009, vol. 25, no S2, p. 37-41. Ring NA, Ritchie K, Mandava L & Jepson R (2011) A guide to synthesising qualitative research for researchers undertaking health technology assessments and systematic reviews. NHS Quality Improvement Scotland (NHS QIS).

IX.-Professors	
Name and surname	IGNACIO PRIETO EGIDO
E-mail address	ignacio.prieto@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Titular de Universidad
Academic degree	Doctor
Person responsible for the subject	Yes
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	2
Number of sexennia	2
No. of positive evaluations by Docentia	3
Name and surname	ÓSCAR BROCHADO KITH
E-mail address	oscar.brochado@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.

Category	Profesor/a Ayudante Doctor/a
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	1
No. of positive evaluations by Docentia	0

Q2803011B UNIVERSIDAD REY JUAN CARLOS
Fecha firma: 14/11/2026 18:41 | Hash: d8c8772e46aefbc69abb08b77d76b4fd.