COURSE DATA

DATA SUBJECT

Code: 36322
Name: Clinical epidemiology
Cycle: Undergraduate Studies
ECTS Credits: 4.5
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1204 - Degree in Medicine	Facultat de Medicina i Odontologia	3	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1204 - Degree in Medicine	Optional subjects	ELECTIVES

COORDINATION

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SUMMARY

Knowing the Evidence-Based Medicine and its application in clinical practice. Assess the level of evidence of different types of studies in clinical epidemiology and able to analyze and discuss measures of association and impact. Analyze the impact of systematic and random errors in clinical epidemiology and its application to risk estimation and forecasting
Synthesizing qualitative and quantitative methodologies by different meta-analysis and discuss its clinical application.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

Epidemiology and Preventive Medicine

COMPETENCES / LEARNING OUTCOMES

1204 - Degree in Medicine

Acknowledge diversity and multiculturality.

Capacity for communicating with professional circles from other domains.

Consideration of ethics as a fundamental value in the professional practise.

Criticism and self-criticism skills.

Obtain and use epidemiological data and evaluate tendencies and risks influencing health decision-making.

Proper organisation and planning of the workload and timing in professional activities.

Recognise health determinants in population, such as genetic ones, dependent on sex, lifestyle, demographic, environmental, social, economic, psychological and cultural.

Students must be able to apply their knowledge to their work or vocation in a professional manner and have acquired the competences required for the preparation and defence of arguments and for problem solving in their field of study.

Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.

Team-working skills and engaging with other people in the same line of work or different.

Working capacity to function in an international context.

DESCRIPTION OF CONTENTS

1. Clinical epidemiology: Concepts and basic tools.

2. Evaluation of the Scientific Evidence. Evidence-Based Medicine and its application in clinical practice.

3. Stages of the research process: Variables.

4. Clinical Epidemiology: Sample size, Error α and β.

5. Frequency measures in epidemiology.

6. Types of epidemiological studies and their application for the evaluation of scientific evidence.

7. Level of evidence from cross-sectional studies, ecological studies and other epidemiological studies. Design, data analysis, applications, advantages and limitations.

1. Theory I

1. Clinical epidemiology: Concepts and basic tools.

2. Evaluation of the Scientific Evidence. Evidence-Based Medicine and its application in clinical practice.

3. Stages of the research process: Variables.

4. Clinical Epidemiology: Sample size, Error α and β.

5. Frequency measures in epidemiology.
8. Level of evidence in case-control studies. Design alternatives to increase the level of evidence. Analysis of data and advantages and limitations.

9. Influence of random errors in the evidence from epidemiological studies. Relevance of the number of patients studied. Criteria to reduce Type I errors and Type II. Impact of multiple comparisons in these errors.

10. Major systematic errors in epidemiological studies. Selection bias, information bias and confounding. Impact of differential misclassification and differential in the level of evidence.

11. Internal validity and external validity. Its impact on the prevention and treatment of disease.

2. Theory II

12. Overall assessment of the evidence available: classic review, systematic review and meta-analysis. Meta-analysis of qualitative and quantitative meta-analysis. Calculation of global media estimates of the association: fixed effects, random effects model, Bayesian model. Analysis of heterogeneity. Meta-regression. Subgroup analyzes and sensitivity.

13. Difference between risk factors and prognostic factors. Analysis of clinical decisions.

14. Criteria for selection of diagnostic tests. Screening tests. Tests for population screening. Interpretation and limitations of the analysis of sensitivity, specificity and predictive value. Quantitative evaluation by ROC curves.

15. Epidemiology and molecular genetics. Design studies. Analysis of gene-environment interactions and gene-gene analysis. Bioinformatics tools applied. Interpretation and Application of Genome-Wide Association Studies and Genome-Wide Interaction Studies.

16. Middle environmental epidemiology. Questionnaire design and validation of environmental exposure to new information technologies. Risk-exposure matrices. Air pollution. Time series of mortality and morbidity.

3. Practice

Seven seminars of two hours each one and six computer practical sessions of two hours each one, they will be given them

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	19,00
Seminar	14,00
Computer classroom practice	12,00
Total hours	**45,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	7,50
Independent study and work	60,00
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**67,50**

TEACHING METHODOLOGY

The theoretical contents will be given across lessons composed in a dialogue with the students promoting the participation of the student across questions.

These theoretical meetings will have the complement of the tutorships and virtual tutorships.

In the practical meetings, methodology based on learning by resolution of problems and the learning for project will be used. The pupils will have to develop along almost the whole course and parallel to the develop of the theoretical contents, a project of investigation that will allow them to acquire knowledge, attitudes and skills in a real situation. The work will be promoted in group that will allow the development of capacities of communication and oral coherent and logical expression.

The gender perspective, respect for diversity and the sustainable development goals (SDGs) will be incorporated into teaching, whenever possible.

EVALUATION

a) Theoretical evaluation: 50% of the final grade. It will be carried out by means of a written test that will deal on the contents of the theoretical program and its objective will be to evaluate the acquisition of knowledge.

b) Practical evaluation: 50% of the total grade (25% seminar and 25% computer practices). It will be carried

out by means of the evaluation of the participation in the different activities and with the realization of a test that evaluates the acquisition of the abilities related to the general and specific competences.

The course will be passed with a grade equal to or higher than 5 with a minimum of 2.5/5 in theory and 2.5 /5 in practice.

In the case that the evaluation tests are of the multiple-choice type, for every 3 wrongly answered questions, 1 will be subtracted from the correct ones. Blank answers will not be subtracted.

It is a requirement for the student to have completed all the internships in order to have access to the advance of this subject.

The continuous assessment activities, which in this subject are practices, tutorials and seminars, are of MANDATORY ATTENDANCE and, therefore, NOT RECOVERABLE, in accordance with the provisions of article 6.5 of the Regulation of Evaluation and Qualification of the UV for Bachelor and Master degrees. The student is considered to meet this requirement if he or she has attended a minimum of 80% of these activities and has adequately justified the impossibility of attending the remaining sessions due to the occurrence of a cause of force majeure. It will be essential to comply with this requirement to pass the subject.

In the event that, for justified reasons, it is not possible to attend any of these activities, it must be communicated sufficiently in advance. In this way, the person in charge of the subject may assign the student a session in another group.

Copying or plagiarism of any assignment that forms part of the assessment will result in the impossibility of passing the subject, and the student will then be subject to the appropriate disciplinary procedures. Please note that, in accordance with article 13. d) of the University Student Statute (RD 1791/2010, 30 December), it is the duty of a student to refrain from using or cooperating in fraudulent procedures in assessment tests, in the work carried out or in official university documents.

In the case of fraudulent practices, the procedure will be as determined by the "Protocol of action against fraudulent practices at the University of Valencia" (ACGUV 123/2020): https://www.uv.es/sgeneral/Protocols/C83sp.pdf .

Students are reminded of the importance of carrying out the evaluation surveys to all the teaching staff of the degree courses.

REFERENCES

- Martínez-González MA, Sánchez-Villegas A, Faulín Fajardo J. Bioestadística amigable. Díaz de Santos: Madrid, 2006
- Sierra López A, Saénz González MC, Fernández-Créhuet Navajas J, Salleras Sanmartí L, Cueto Espinar A, Gestal Otero J, Domínguez Rojas V, Delgado Rodríguez M, Bolumar Montrull F,

Herruzo Cabrera R, Serra Majem L (dirs.). Medicina Preventiva y Salud pública. 11ª ed. Barcelona: Elsevier-Masson, 2008.

- RECURSOS e-Salut:

  - ClinicalKey Student Medicina, Odontologia y Enfermería [https://uv-es.libguides.com/RecursosSalut]
  - Acces Medicina [https://uv-es.libguides.com/Access_Medicina]
  - Médica Panamericana [https://uv-es.libguides.com/Medica_Panamericana]