66859 - Omics tools in the study of health

Syllabus Information

Academic year: 2023/24
Subject: 66859 - Omics tools in the study of health
Faculty / School: 105 - Facultad de Veterinaria
Degree: 617 - Master's in Global Health: Integration of Environmental, Human and Animal Health
ECTS: 3.0
Year: 1
Semester: Second semester
Subject type: Optional
Module:

1. General information

The main objective of the subject is the management and integration of omic techniques (genomics, transcriptomics, proteomics, metabolomics, epigenomics and metagenomics) and their application in the search for biomarkers and disease resistance factors. Theoretical classes will introduce the student to the basics of omics tools. There will also be practical classes, where this knowledge will be applied to the use of bioinformatics tools and the interpretation of results. These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda(https://www.un.org/sustainabledevelopment/es/), specifically, the learning activities planned in this subject will contribute to the achievement of Objectives 3.3 and 3.4 (Goal 3), 4.4 (Goal 4), 8.6 (Goal 8), 9.5 (Goal 9), 12.2 (Goal 12), and 16.6 (Goal 16).

2. Learning results

- To understand the basics of economic studies.
- To be able to interpret the results of economic analyses.
- To know how to design a study using economic tools.
- To critically assess scientific articles using economic tools.
- To know how to perform basic analysis of results obtained with economic tools.

3. Syllabus

- BLOCK I: Introduction to omics analysis: genomics, transcriptomics, proteomics, metabolomics, epigenomics, metagenomics.
- BLOCK II: Statistical methods for economic data analysis: pre-processing, analysis and interpretation
- BLOCK III: Applications of omics tools for biomarker discovery: clinical development, transcriptomics and proteomics tools
- BLOCK IV: Genomic analyses for the identification of the genetic basis of disease resistance and resilience: host genetic variation in disease resistance, selection for genetic resistance to disease.

4. Academic activities

- **Lectures (20 hours):** sessions where the teacher will explain the topics mentioned in the syllabus.
- **Practical classes (10 hours):** bioinformatics practices on transcriptomic, metagenomic and genome-wide association data exploration.
- **Teaching assignments (10 hours):** individual work (bibliographic review), solving of practical cases in groups.
- **Autonomous student work (34 hours)**
- **Assessment tests (1 hour)**

5. Assessment system

There will only be a **global assessment** method based on the following activities (percentage of the final grade is shown):

- **Practice assessment (30%):** at the end of each practice, the student will have to fill in a questionnaire to assess whether they has acquired the required competencies. The grade for this activity will be from 0 to 10, and a minimum grade of 5 out of 10 is required to pass it.
- **Group work (20%)** students will have to demonstrate their ability to interpret results of omics data by solving specific cases. They will have to justify and reason their solution of the same in a written report to be submitted at the end of the term. The grade for this activity will be from 0 to 10, and a minimum grade of 5 out of 10 is required to pass it.
- **Individual work(30%):** at the end of the term, the student must submit a bibliographic review of the different economic

tools used in the diagnosis and prevention of a disease of their choice. The grade for this activity will be from 0 to 10, and a minimum grade of 5 out of 10 is required to pass it. It will take into account the following aspects: originality of the work (30%), understanding of the methodologies described (30%), literature review: search, understanding and interpretation (40%).

- **Final exam (20%):** The acquisition of basic theoretical knowledge of the subject will be assessed by means of a final exam of 20 multiple-choice questions. The grade for this test will be from 0 to 10, and a minimum grade of 5 out of 10 is required to pass it.