UFV
Teaching guide

IDENTIFICATION DETAILS

Degree:	Biomedicine

Scope	Biology and Genetics

Faculty/School:	Experimental Sciences

Course:	ADVANCED BIOINFORMATICS

Type:	Compulsory	ECTS credits:	3

Year:	4	Code:	2166

Teaching period:	Seventh semester

Subject:	Biomedical Research Tools

Module:	Experimental Methodology in Biomedicine

Teaching type:	Classroom-based

Language:	Spanish

Total number of student study hours:	75

SUBJECT DESCRIPTION

The course seeks to extend and deepen the contents and competencies acquired in Basic Bioinformatics. To this end, it expands the introduction of the main computational techniques of genomic data analysis, modeling and simulation, and systems biology. In addition, the course seeks students to learn the fundamentals of the Linux operating system and basic programming and scripting techniques.

GOAL

The final objective of the Advanced Bioinformatics course is to acquire competencies to manage and understand standard computational methodologies in the fields of genomics and transtoxomics, systems biology and

molecular modeling.

The specific aims of the subject are:

Delve into advanced methods of obtaining, processing and visualizing complex biological information.

Analyze and correctly interpret the scope and reliability of bioinformatic analyses and predictions in the context of biomedical research.

Start the advanced management of computational methods.

PRIOR KNOWLEDGE

It is highly recommended that the student has passed the basic Bioinformatics course.

COURSE SYLLABUS

Topic 1. Introduction to Linux.
Theme 2. Foundations of scientific programming.
Theme 3. Introduction to systems biology.
Topic 4. Bioinformatic analysis of proteins.
Topic 5. Computational modeling of tertiary structures.
Theme 6. Computer drug design and study of protein-ligand interactions.

EDUCATION ACTIVITIES

The teaching+learning methodology in the subject of Basic Bioinformatics will be carried out through the following mandatory training activities (AF):
AF1. Participatory expository class sessions.
AF2. Participatory practical class sessions.
AF3. Carrying out practical work.
AF4. Attendance at seminars.
AF5. Tutorials
TUTORING
- At the beginning of the course, the teacher will inform about the tutoring schedule and will be accessible in the Virtual Classroom of the subject. It can also be consulted in the Degree Coordinator.
OTHERS
"Training activities, as well as the distribution of working hours, can be modified and adapted according to the different scenarios established following the instructions of the health authorities"

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DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK
30 Horas	45 Horas

LEARNING RESULTS

Know the basics of programming and its potential uses in Biomedicine.

Know and understand the applicability of multidisciplinary techniques that include concepts of nucleic acid and protein chemistry, sequencing and analysis of these biomolecules included in the area of bioinformatics.

SPECIFIC LEARNING RESULTS

He understands and manages the main programming and scripting procedures.

Understand and manage the fundamentals of the computational methods currently used in biomedical research.

Analyze and correctly interpret original scientific articles related to the theoretical and practical contents of the subject.

LEARNING APPRAISAL SYSTEM

The evaluation of the subject seeks to assess the acquisition and degree of development of all the competencies provided for in this teaching guide by students. RA1-RA3 learning outcomes will be evaluated.
MINIMUM REQUIREMENTS TO PASS THE COURSE

In any call, evaluation system or health situation, the subject is passed by obtaining a minimum score of 5 in each and every one of the 'CAL' grades broken down into the following sections of this Teaching Guide.
EVALUATION SYSTEMS
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1) ORDINARY
Based on continuous evaluation. The final grade will consist of the following grades, according to the indicated percentages:
- CAL1 (60%): continuous evaluation of the theoretical, practical and methodological contents covered in the course. It will consist of test-type, short-answer and/or development questions, and/or practical, individual and/or

group work.

- CAL2 (20% + 20%): carrying out and evaluating experimental work, individually or in groups (20%). Carrying out and solving exercises and practices developed during the course (20%).

Extraordinary calls. If you have not passed CAL1, you must complete the exercises, practical and applied, individual and group work carried out in class.

In the event of not passing CAL2, the student must submit the exercises, papers and suspended activities carried out during the semester of the current academic year. As a general rule, the qualifications of the different parties approved in the ordinary call will be preserved.

2) ALTERNATIVE (option only for repeat students)

Not based on continuous evaluation. The teaching-learning process will be monitored through tutoring, which may be mandatory. 'This system is intended for repeat students who do not take advantage of the ordinary evaluation system because they cannot attend classes on a regular basis. Students in second or subsequent enrollment must contact the teacher to request to take advantage of this system." The final grade will consist of the following grades, according to the indicated percentages:

- CAL1 (60%): continuous evaluation of the theoretical, practical and methodological contents covered in the course. It will consist of test-type, short-answer and/or development questions, and/or practical, individual and/or group work.

- CAL2 (20% + 20%): carrying out and evaluating experimental work, individually or in groups (20%). Carrying out and solving exercises and practices developed during the course (20%).

Extraordinary calls. If you have not passed CAL1, you must complete the exercises, practical and applied, individual and group work carried out in class.

In the event of not passing CAL2, the student must submit the exercises, papers and suspended activities carried out during the semester of the current academic year. As a general rule, the qualifications of the different parties approved in the ordinary call will be preserved.

EXAMS AND PARTIAL TESTS

There is the possibility of proposing partial non-liberatory tests. The criteria for including these grades in the final grade of the subject will be communicated sufficiently in advance to all enrolled students, through publication in the virtual classroom system of the subject.

SECOND AND SUBSEQUENT ENROLLMENTS (repeat students)

Repeat students who are unable to attend classes on a regular basis have the option of taking advantage of the Alternative Assessment System. To request to be evaluated using this system, they must necessarily contact the teacher at the beginning of the course. If this is not done, it is assumed that the student accepts the Ordinary Evaluation System. (See 'Alternative Assessment System'). As a general rule, CAL1 and CAL2 scores are not retained between academic years.

DEADLINES FOR SUBMISSION OF PAPERS

The time allotted for the completion and delivery of works will be announced in the virtual classroom well in advance. Papers submitted after the deadline will be rated zero.

GENERAL CRITERIA FOR EVALUATING ACTIVITIES

"Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations."

When grading exams and papers, the technical and scientific correctness of the student's original production, as well as their expressive capacity and language correction, will be assessed. For this purpose, account will be taken of (1) the ownership of vocabulary and syntax, (2) the formal correction of schemes, tables and references, and (3) the appropriate general presentation. In the particular case of written works, the mere presentation of results copied from calculation programs or bioinformatics resources/services for public use on the Internet does not imply obtaining an approval. To approve these works, it will be essential for the student to contribute in an

original way to the production subject to evaluation.

EXCEPTION: the incorrect use and/or spelling of acronyms specific to the subject matter covered in the subject may result in the classification of suspense in the affected party (s). Likewise, the incorrect use of scientific and technical terms may result in the classification of suspense in the affected party (s).

ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:

a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.

b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.

c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(https://www.ufv.es/gestion-de-la-informacion_biblioteca/).

d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.

2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the Guide for the Responsible Use of Artificial Intelligence in Studies at UFV. Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.

3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

SEVERAL AUTHORS Tutorials and/or manuals that will be provided during the course