

## Syllabus

### Subject

|                                |  |
|--------------------------------|--|
| <b>Subject / Group</b>         | 11261 - Bioinformatics / 1                           |
| <b>Degree</b>                  | Master's in Nutrigenomics and Personalised Nutrition |
| <b>Credits</b>                 | 3  |
| <b>Period</b>                  | 2nd semester   |
| <b>Language of instruction</b> | English  |

### Professors

| Lecturers  | Office hours for students   |                |        |            |            |                                |
|--|---|----------------|--------|------------|------------|--------------------------------|
|  | Starting time   | Finishing time | Day    | Start date | End date   | Office / Building              |
| Gerard Pujadas Anguiano  | You need to book a date with the professor in order to attend a tutoring session. |                |        |            |            |                                |
| Ana María Rodríguez Guerrero<br><a href="mailto:amrodriguez@uib.es">amrodriguez@uib.es</a> | 15:00   | 16:00          | Monday | 01/10/2018 | 30/09/2019 | Q.11 / Mate<br>Orfila building |

### Context

The students of this course have different background and interests for bioinformatics. Therefore, we have designed the course with the goal on mind that you have to learn bioinformatics skills that can be useful for all of you. Following with this idea, the course have two chapters where you will learn how to search and how to analyze biologic information. In the first chapter, you will learn to use the SRS (Sequence Retrieval System). This is a web interface to a large number of biological databases and analysis tools. In the second chapter you will learn to search into microarray results databases.

Gerard Pujadas Anguiano is a PhD in Chemistry from the Rovira i Virgili University and principal investigator of the research group in Chemoinformatics and Nutrition of said University (Research Group consolidated by the Generalitat de Catalunya). He has published articles on research in Bioinformatics in prestigious international journals such as Nucleic Acids Research, Bioinformatics, Plos One, Protein Science, Proteins: Structure, Function & Bioinformatics and Journal of Cheminformatics (among others).

### Requirements

No special skills

### Skills

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### Specific

- \* G13 - Knowing the capabilities and potential of ICT (Information and Communication) in the bioinformatics area. .

### Generic

- \* Known the capabilities of the new technologies and their application to the nutrition and nutrigenomics fields .
- \* CB7 - That students can apply their knowledge and ability in problem solving environments new or unfamiliar within broader (or multidisciplinary) contexts related to their field of study .

### Basic

- \* You may consult the basic competencies students will have to achieve by the end of the Master's degree at the following address: [http://estudis.uib.cat/master/comp\\_basiques/](http://estudis.uib.cat/master/comp_basiques/)

## Content

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The contents of the course is:

### Range of topics

- 1.. Sequence analysis of proteins and nucleic acids
  - Sequence databases for proteins and nucleic acids.
  - Sequence searching in databases and analysis of the retrieved information.
  - Sequence comparison
- 2.. Analysis of protein structures and nucleic acids
  - 3D structural databases for proteins and nucleic acids
  - Looking for 3D structures of proteins and nucleic acids and visual analysis of their main features
  - Protein structure comparison
- 3.. Predicting bioactivity of ligands
  - 3.1. Databases ligands nutritional interest
  - 3.2. Fundamentals of virtual screening
  - 3.3. Virtual screening in the absence of the 3D structure of the target
  - 3.4. Virtual screening in the presence of the 3D structure of the target

## Teaching methodology

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The methodology used will be:

### Workload

The activities of the course will be:

In-class work activities (0 credits, 0 hours)



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| Modality | Name                              | Typ. Grp.       | Description | Hours |
|----------|-----------------------------------|-----------------|-------------|-------|
| Other    | There is no activity of this type | Large group (G) | a           | 0     |

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Aula Digital platform.

### Distance education tasks (3 credits, 75 hours)

| Modality              | Name      | Description   | Hours |
|-----------------------|-----------|---|-------|
| Individual self-study | Exercises | To analyze the sequences and structures of nucleic acids and proteins by using software and specialized databases in the field of Molecular Biology. Predict and analyze specific capabilities as bioactive ligands based on their structure and composition. | 73    |
| Individual self-study | Exam      | Exam  | 2     |

### Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

### Student learning assessment

The evaluation will be done according to the following criteria:

#### Frau en elements d'avaluació

In accordance with article 33 of Academic regulations, "regardless of the disciplinary procedure that may be followed against the offending student, the demonstrably fraudulent performance of any of the evaluation elements included in the teaching guides of the subjects will lead, at the discretion of the teacher, a undervaluation in the qualification that may involve the qualification of "suspense 0" in the annual evaluation of the subject".

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### Exercises

|             |   |
|-------------|---|
| Modality    | Individual self-study   |
| Technique   | Student internship dissertation ( <b>non-retrievable</b> )  |
| Description | To analyze the sequences and structures of nucleic acids and proteins by using software and specialized databases in the field of Molecular Biology. Predict and analyze specific capabilities as bioactive ligands based on their structure and composition. |

Assessment criteria

Final grade percentage: 50%

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### Exam

|             |   |
|-------------|---|
| Modality    | Individual self-study                     |
| Technique   | Short-answer tests ( <b>retrievable</b> ) |
| Description | Exam                                      |

Assessment criteria

Final grade percentage: 50%

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### Resources, bibliography and additional documentation

The materials used (videos, web pages, etc..) will be available through the course moodle space

