



| Teaching Guide           |  |        |   |         |
|--------------------------|--|--------|---|---------|
| Identifying Data         |  |        |   | 2020/21 |
| Subject (*)              | Introduction to molecular biology  | Code   | 614522004   |         |
| Study programme          | Mestrado Universitario en Bioinformática para Ciencias da Saúde  |        |   |         |
| Descriptors              |  |        |   |         |
| Cycle                    | Period   | Year   | Type  | Credits |
| Official Master's Degree | Yearly   | First  | Optional  | 6       |
| Language                 | Spanish  |        |   |         |
| Teaching method          | Face-to-face   |        |   |         |
| Prerequisites            |  |        |   |         |
| Department               | Biología   |        |   |         |
| Coordinador              | Lamas Maceiras, Mónica   | E-mail | monica.lamas@udc.es   |         |
| Lecturers                | Gonzalez Siso, Maria Isabel<br>Lamas Maceiras, Mónica<br>Rodriguez Belmonte, Esther<br>Rodriguez Torres, Ana Maria   | E-mail | isabel.gsiso@udc.es<br>monica.lamas@udc.es<br>esther.belmonte@udc.es<br>ana.rodriguez.torres@udc.es |         |
| Web                      |  |        |   |         |
| General description      | This course tries to show the basic principles of molecular biology, i.e., the basis of the information of the hereditary material, transmission, analysis and evolution.  |        |   |         |
| Contingency plan         | 1. Modifications to the contents<br><br>2. Methodologies<br>*Teaching methodologies that are maintained<br><br>*Teaching methodologies that are modified<br><br>3. Mechanisms for personalized attention to students<br><br>4. Modifications in the evaluation<br><br>*Evaluation observations:<br><br>5. Modifications to the bibliography or webgraphy |        |   |         |

| Study programme competences / results |  |
|---------------------------------------|--|
| Code                                  | Study programme competences / results  |
| A8                                    | CE8 - Understanding the basis of the information of the hereditary material, its transmission, analysis and evolution  |
| B1                                    | CB6 - Own and understand knowledge that can provide a base or opportunity to be original in the development and/or application of ideas, often in a context of research  |
| B2                                    | CB7 - Students should know how to apply the acquired knowledge and ability to problem solving in new environments or little known within broad (or multidisciplinary) contexts related to their field of study |
| B5                                    | CB10 - Students should possess learning skills that allow them to continue studying in a way that will largely be self-directed or autonomous.   |
| B6                                    | CG1 - Search for and select the useful information needed to solve complex problems, driving fluently bibliographical sources for the field  |
| B7                                    | CG2 - Maintain and extend well-founded theoretical approaches to enable the introduction and exploitation of new and advanced technologies   |
| B8                                    | CG3 - Be able to work in a team, especially of interdisciplinary nature  |
| C1                                    | CT1 - Express oneself correctly, both orally writing, in the official languages of the autonomous community  |
| C2                                    | CT2 - Dominate the expression and understanding of oral and written form of a foreign language   |



|    |   |
|----|---|
| C3 | CT3 - Use the basic tools of the information technology and communications (ICT) necessary for the exercise of their profession and lifelong learning |
| C7 | CT7 ? To maintain and establish strategies for scientific updating as a criterion for professional improvement.                                       |
| C8 | CT8 - Rating the importance that has the research, innovation and technological development in the socio-economic and cultural progress of society    |

| Learning outcomes  |  |                                       |  |                                 |
|--|--|---------------------------------------|--|---------------------------------|
| Learning outcomes  |  | Study programme competences / results |  |                                 |
| Understanding the basis of the information of the hereditary material, its transmission, analysis and evolution. |  | AJ8                                   | BJ1<br>BJ2<br>BJ5<br>BJ6<br>BJ7<br>BJ8 | CJ1<br>CJ2<br>CJ3<br>CJ7<br>CJ8 |

| Contents                                  |  |
|---|--|
| Topic                                     | Sub-topic  |
| Nucleic acids                             | Nucleic acids characteristics<br>Replication<br>Transcription<br>Translation |
| Proteins                                  | Proteins: structure and levels of organization<br>Processing of proteins     |
| Principles of Regulation                  | Regulation of gene expression in eukaryotes and prokaryotes                  |
| General principles of cellular signalling | Introduction to the molecular mechanisms of cell communication               |

| Planning                       |                        |                                      |                               |             |
|--------------------------------|------------------------|--------------------------------------|-------------------------------|-------------|
| Methodologies / tests          | Competencies / Results | Teaching hours (in-person & virtual) | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech | A8 B1 B7 C7 C8         | 20                                   | 0                             | 20          |
| Problem solving                | B2 B5 B6 B8 C1 C3      | 29                                   | 33                            | 62          |
| ICT practicals                 | B2 B6 B8 C2 C3         | 30                                   | 30                            | 60          |
| Personalized attention         |                        | 8                                    | 0                             | 8           |

(\*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

| Methodologies                  |  |
|--------------------------------|--|
| Methodologies                  | Description  |
| Guest lecture / keynote speech | Theoretical description of the basic principles of the molecular biology   |
| Problem solving                | Application of acquired knowledge in the solution of real problems   |
| ICT practicals                 | Using computer programs for analysis of nucleotide and proteins sequences, related to basic principles of transmission of the genetic information and its regulation |

| Personalized attention            |   |
|-----------------------------------|---|
| Methodologies                     | Description   |
| Problem solving<br>ICT practicals | Students can request personalized tutorials to answer any questions |



## Assessment

| Methodologies   | Competencies / Results | Description   | Qualification |
|-----------------|------------------------|---|---------------|
| Problem solving | B2 B5 B6 B8 C1 C3      | Evaluation of the capacity of the student to solve problems on molecular biology by exercises and/or in a test  | 50            |
| ICT practicals  | B2 B6 B8 C2 C3         | Evaluation of the capacity of the student to use computer programs for nucleotide and protein sequence analysis | 50            |

## Assessment comments

According to regulations of Qualifications and Proceedings, the Faculty's Commission of Quality agreed that the recommendation of the Honours will be given to the students who obtain the highest marks in the first evaluation.

NO PRESENTED will be applicable when the student do not take the objective test.

Exceptionally, in the case of those students that, by justified reasons, could not realize all the proofs of evaluation, the professor will adopt the measures that he would consider opportune.

## Sources of information

|                      |   |
|----------------------|---|
| <b>Basic</b>         | <ul style="list-style-type: none"><li>- Harvey Lodish ... [et al.] (2015). <i>Biología celular y molecular</i>. Buenos Aires ; Madrid : Médica Panamericana</li><li>- Karp, Gerald (2014). <i>Biología celular y molecular : conceptos y experimentos</i>. México D.F. : McGraw-Hill</li><li>- Nancy Craig ... [et al.] (2014). <i>Molecular biology : principles of genome function</i>. Oxford : Oxford University Press</li><li>- Whitford, David. (2005). <i>Proteins : structure and function</i>. Chichester (England) : John Wiley &amp; Sons</li><li>- Marks, Friedrich (2009). <i>Cellular signal processing : an introduction to the molecular mechanisms of signal transduction</i>. Friedrich Marks, Ursula Klingmèuller, Karin Mèuller-Decker.</li></ul> |
| <b>Complementary</b> |   |

## Recommendations

### Subjects that it is recommended to have taken before

### Subjects that are recommended to be taken simultaneously

Genetics and molecular evolution/614522005

### Subjects that continue the syllabus

Genomics/614522006

### Other comments

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.