



## Teaching Guide

| Teaching Guide           |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                                                                                                                                                                                                                                                        |           |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Identifying Data         |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                                                                                                                                                                                                                                                        | 2019/20   |
| Subject (*)              | Master thesis                                                                                                                                                                                                                                                                                                                                                                                                                                      |        | Code                                                                                                                                                                                                                                                                                                   | 614522025 |
| Study programme          | Mestrado Universitario en Bioinformática para Ciencias da Saúde                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                                                                                                                                                                                                                                                        |           |
| Descriptors              |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                                                                                                                                                                                                                                                        |           |
| Cycle                    | Period                                                                                                                                                                                                                                                                                                                                                                                                                                             | Year   | Type                                                                                                                                                                                                                                                                                                   | Credits   |
| Official Master's Degree | 2nd four-month period                                                                                                                                                                                                                                                                                                                                                                                                                              | Second | Obligatory                                                                                                                                                                                                                                                                                             | 12        |
| Language                 | SpanishGalicianEnglish                                                                                                                                                                                                                                                                                                                                                                                                                             |        |                                                                                                                                                                                                                                                                                                        |           |
| Teaching method          | Face-to-face                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                                                                                                        |           |
| Prerequisites            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                                                                                                                                                                                                                                                        |           |
| Department               | BioloXíaCiencias da Computación e Tecnoloxías da InformaciónEnxeñaría de ComputadoresFisioterapia, Medicina e Ciencias Biomédicas                                                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                                                        |           |
| Coordinador              |                                                                                                                                                                                                                                                                                                                                                                                                                                                    | E-mail |                                                                                                                                                                                                                                                                                                        |           |
| Lecturers                | Bolón Canedo, Verónica<br>González Domínguez, Jorge<br>Ladra González, Susana<br>Martin Santamaria, Maria Jose<br>Martinez Lage, Andres<br>Munteanu , Cristian Robert<br>Novo Bujan, Jorge<br>Ortega Hortas, Marcos<br>Parapar López, Javier<br>Pereira Loureiro, Javier<br>Rey Expósito, Roberto<br>Rivadulla Fernandez, Juan Casto                                                                                                               | E-mail | veronica.bolon@udc.es<br>jorge.gonzalezd@udc.es<br>susana.ladra@udc.es<br>maria.martin.santamaria@udc.es<br>andres.martinez@udc.es<br>c.munteanu@udc.es<br>j.novo@udc.es<br>m.ortega@udc.es<br>javier.parapar@udc.es<br>javier.pereira@udc.es<br>roberto.rey.exposito@udc.es<br>casto.rivadulla@udc.es |           |
| Web                      | www.master.bioinformatica.udc.es                                                                                                                                                                                                                                                                                                                                                                                                                   |        |                                                                                                                                                                                                                                                                                                        |           |
| General description      | The Master's Thesis is an original exercise to be done individually, consisting of a comprehensive project in the field of bioinformatics from a technological perspective or from the life sciences or health. Professional or researcher in which the competences of the degree are synthesized, and that to overcome it will be presented and defended in front of a university court, when they have overcome the other credits of the degree. |        |                                                                                                                                                                                                                                                                                                        |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                                                                                       |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1   | CE1 - Ability to know the scope of Bioinformatics and its most important aspects                                                                                                                                                                                                  |
| A10  | CE10 - Draft a bioinformatics research project, anticipating obstacles and possible alternative strategies to resolve them.                                                                                                                                                       |
| 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                                                                    |
| B3   | CB8 - Students to be able to integrate knowledge and deal with the complexity of making judgements from information that could be incomplete or limited, including reflections on the social and ethical responsibilities linked to the application of their skills and judgments |
| B4   | CB9 - Students should know how to communicate their findings, knowledge and latest reasons underpinning them to specialized and non-specialized audiences in a clear and unambiguous way                                                                                          |
| 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                                                                        |
| C4 | CT4 - Be able to analyze the real situation, formulate and implement solutions based on knowledge and aimed at the common good and the exercise of open, educated, critical, committed, democratic and solidary citizenship. |
| C5 | CT5 - Understand the importance of entrepreneurial culture and know the means available to enterprising people                                                                                                               |
| C6 | CT6 - To assess critically the knowledge, technology and information available to solve the problems they face to.                                                                                                           |
| 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 |     |
| Saber desenvolver, presentar e defender ante un tribunal un proxecto integral de Informática biomédicas de natureza investigadora no que se sintetizan as competencias adquiridas no título |  | AJ1                         | BJ1 |
|                                                                                                                                                                                             |  | AJ10                        | BJ2 |
|                                                                                                                                                                                             |  |                             | BJ3 |
|                                                                                                                                                                                             |  |                             | BJ4 |
|                                                                                                                                                                                             |  |                             | BJ5 |
|                                                                                                                                                                                             |  |                             | BJ6 |
|                                                                                                                                                                                             |  |                             | BJ7 |
|                                                                                                                                                                                             |  |                             | BJ8 |
|                                                                                                                                                                                             |  | CJ1                         | CJ2 |
|                                                                                                                                                                                             |  |                             | CJ3 |
|                                                                                                                                                                                             |  |                             | CJ4 |
|                                                                                                                                                                                             |  |                             | CJ5 |
|                                                                                                                                                                                             |  |                             | CJ6 |
|                                                                                                                                                                                             |  |                             | CJ7 |
|                                                                                                                                                                                             |  |                             | CJ8 |

| Contents                                                                                                                                                                                                 |                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Topic                                                                                                                                                                                                    | Sub-topic                                                                                                    |
| No Traballo Fin de Mestrado, o estudante debe realizar un proxecto integral de bioinformática , de natureza investigadora ou profesional, no que se sintetizan as competencias adquiridas na titulación. | Para proceder a súa defensa, o estudante deberá ter superados os créditos do resto das materias do mestrado. |

| Planning                                                                                                                        |                                                              |                      |                               |             |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests                                                                                                           | Competencies                                                 | Ordinary class hours | Student?s personal work hours | Total hours |
| Oral presentation                                                                                                               | A1 A10 B1 B2 B3 B4<br>B5 B6 B7 B8 C1 C2<br>C3 C4 C5 C6 C7 C8 | 2                    | 3                             | 5           |
| Supervised projects                                                                                                             | A1 A10 B1 B2 B3 B4<br>B5 B6 B7 B8 C1 C2<br>C3 C4 C5 C6 C7 C8 | 15                   | 270                           | 285         |
| Personalized attention                                                                                                          |                                                              | 10                   | 0                             | 10          |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |                                                              |                      |                               |             |

| Methodologies       |                                                                                                                                                                                                                                                          |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies       | Description                                                                                                                                                                                                                                              |
| Oral presentation   | O traballo fin de mestrado será defendido fronte a un tribunal que será establecido pola Comisión Académica para cada convocatoria                                                                                                                       |
| Supervised projects | O alumno deberá facer un traballo no ámbito da bioinformática ou a informática da saúde orixinal tutorizado por un profesor da titulación coa posibilidade de codirección de outros profesionais ou investigadores relacionados coa temática do traballo |

| Personalized attention |
|------------------------|
|------------------------|



| Methodologies       | Description                                                                                                                            |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Oral presentation   | Durante o traballo o alumno deberá recibir atención personalizada por parte do seu tutor ou tutores.                                   |
| Supervised projects | A atención personalizada é fundamental para definir, orientar, supervisar e delimitar o traballo, así como para preparar a proba oral. |

| Assessment          |                                                              |                                                                                                                                                                                                                                                                                    |               |
|---------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Methodologies       | Competencies                                                 | Description                                                                                                                                                                                                                                                                        | Qualification |
| Oral presentation   | A1 A10 B1 B2 B3 B4<br>B5 B6 B7 B8 C1 C2<br>C3 C4 C5 C6 C7 C8 | Presentación oral e defensa ante un tribunal.<br><br>A presentación debe plasmar de maneira resumida as características e a profundidade do traballo realizado.<br><br>No turno de preguntas debe demostrarse claridade e coñecemento sobre as cuestións planteadas polo tribunal. | 30            |
| Supervised projects | A1 A10 B1 B2 B3 B4<br>B5 B6 B7 B8 C1 C2<br>C3 C4 C5 C6 C7 C8 | Realización dun proxecto integral e orixinal no ámbito da bioinformática de natureza investigadora ou profesional.<br><br>Os elementos a valorar son:<br>- Orixinalidade, calidade e alcance do traballo presentado (40%)<br>- Memoria (30%)                                       | 70            |

| Assessment comments                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Master website publishes the regulations and deadlines for the procedures for the delivery and defense of the Master Thesis<br><a href="https://www.master.bioinformatica.fic.udc.es/trabajo-fin-master/normativa-tfm/">https://www.master.bioinformatica.fic.udc.es/trabajo-fin-master/normativa-tfm/</a> |

| Sources of information |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic                  | - Web master Bioinformatica (2018). Normativa TFM Máster Bioinformática.<br><a href="https://www.master.bioinformatica.fic.udc.es/">https://www.master.bioinformatica.fic.udc.es/</a><br><a href="https://www.master.bioinformatica.fic.udc.es/trabajo-fin-master/normativa-tfm/">https://www.master.bioinformatica.fic.udc.es/trabajo-fin-master/normativa-tfm/</a><br><a href="https://www.master.bioinformatica.fic.udc.es/trabajo-fin-master/normativa-tfm/">https://www.master.bioinformatica.fic.udc.es/trabajo-fin-master/normativa-tfm/</a> |
| Complementary          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Recommendations                                      |
|------------------------------------------------------|
| Subjects that it is recommended to have taken before |



Introduction to databases/614522002  
Introduction to molecular biology/614522004  
Genetics and molecular evolution/614522005  
Genomics/614522006  
Data structures and algorithmics for biological sequences/614522013  
Advanced processing of biological sequences/614522020  
New trends and applications in bioinformatics and biomedical engineering/614522021  
Biomedical knowledge management /614522022  
Design and management of research projects/614522023  
Computational intelligence for high dimensional data/614522024  
Biomechanical engineering, sensing and telemedicine/614522014  
Fundamentals of neuroscience/614522015  
Neuroengineering and innovation in neuroscience/614522016  
Health Information Systems/614522017  
Advanced medical visualization/614522019  
Computational intelligence for bioinformatics/614522012  
Fundamentals of bioinformatics/614522008  
Advanced statistical methods in bioinformatics/614522009  
Analysis of biomedical images/614522010  
High performance computing in bioinformatics/614522011  
Introduction to programming/614522001  
Probability. statistics and elements of biomathematics/614522007  
Foundations of Artificial Intelligence/614522003

#### Subjects that are recommended to be taken simultaneously

Practicum (professional practice)/614522018

#### Subjects that continue the syllabus

#### Other comments

To help get an sustainable environment, the classworks will be :a.- Majority will be requested in digital electronic.b.- If is necessary use paper:-  
Plastics will not be used.- Double-sided prints will be made.- Recycled paper will be used.- Drafting will be avoided.PLAGIARISMCase of detecting  
fraud, copy or plagiarism in the writing of the work of the subject, implying a failure in the evaluation opportunity (0,0) and direct referral to the following  
opportunity. This attitude will be communicated to the Academic Committee and the other professors of the degree. In the event that the irregularity is  
reiterated in a 2nd evaluation, the Commission will be responsible for the temporary or perpetual expulsion of the student from the Degree taken.

(\*)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.