



## Teaching Guide

| Teaching Guide           |                                                                                                                                                             |        |                       |           |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------|-----------|
| Identifying Data         |                                                                                                                                                             |        |                       | 2019/20   |
| Subject (*)              | Advanced medical visualization                                                                                                                              |        | Code                  | 614522019 |
| Study programme          | Mestrado Universitario en Bioinformática para Ciencias da Saúde                                                                                             |        |                       |           |
| Descriptors              |                                                                                                                                                             |        |                       |           |
| Cycle                    | Period                                                                                                                                                      | Year   | Type                  | Credits   |
| Official Master's Degree | 1st four-month period                                                                                                                                       | Second | Optional              | 3         |
| Language                 | Spanish                                                                                                                                                     |        |                       |           |
| Teaching method          | Face-to-face                                                                                                                                                |        |                       |           |
| Prerequisites            |                                                                                                                                                             |        |                       |           |
| Department               | Ciencias da Computación e Tecnoloxías da InformaciónComputación                                                                                             |        |                       |           |
| Coordinador              | Ortega Hortas, Marcos                                                                                                                                       | E-mail | m.ortega@udc.es       |           |
| Lecturers                | Gonzalez Penedo, Manuel                                                                                                                                     | E-mail | manuel.gpenedo@udc.es |           |
|                          | Ortega Hortas, Marcos                                                                                                                                       |        | m.ortega@udc.es       |           |
|                          | Rouco Maseda, Jose                                                                                                                                          |        | jose.rouco@udc.es     |           |
| Web                      | moodle.udc.es                                                                                                                                               |        |                       |           |
| General description      | Aspectos Teóricos e Prácticos relacionados coa Visualización e o tratamento automáticos de datos adquiridos mediante diferentes modalidades de imaxe médica |        |                       |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                                                                                                   |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1   | CE1 - Ability to know the scope of Bioinformatics and its most important aspects                                                                                                                                                                                                              |
| A2   | CE2 ? To define, evaluate and select the architecture and the most suitable software for solving a problem in the field of bioinformatics                                                                                                                                                     |
| A3   | CE3 ? To analyze, design, develop, implement, verify and document efficient software solutions based on an adequate knowledge of the theories, models and techniques in the field of Bioinformatics                                                                                           |
| A4   | CE4 - Ability to acquire, obtain, formalize and represent human knowledge in a computable form for the resolution of problems through a computer system in any field of application, particularly those related to aspects of computing, perception and action in bioinformatics applications |
| 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                                                                                                                                                    |
| C1   | CT1 - Express oneself correctly, both orally writing, in the official languages of the autonomous community                                                                                                                                                                                   |
| C3   | CT3 - Use the basic tools of the information technology and communications (ICT) necessary for the exercise of their profession and lifelong learning                                                                                                                                         |
| C6   | CT6 - To assess critically the knowledge, technology and information available to solve the problems they face to.                                                                                                                                                                            |
| 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 |
|-------------------|-----------------------------|
|-------------------|-----------------------------|



|                                                                                                                                    |     |     |     |
|------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|
| Comprender e interpretar o movemento e a temporalidade en diferentes dominios médicos.                                             | AJ1 | BJ1 | CJ1 |
|                                                                                                                                    | AJ2 | BJ2 | CJ3 |
|                                                                                                                                    | AJ3 | BJ5 | CJ6 |
|                                                                                                                                    | AJ4 | BJ6 | CJ8 |
|                                                                                                                                    |     | BJ7 |     |
| Entender conceptos para a segmentación baseada en modelos.                                                                         | AJ1 | BJ1 | CJ1 |
|                                                                                                                                    | AJ2 | BJ2 | CJ3 |
|                                                                                                                                    | AJ3 | BJ5 | CJ6 |
|                                                                                                                                    | AJ4 | BJ6 | CJ8 |
|                                                                                                                                    |     | BJ7 |     |
| Comprender estratexias orientadas á visualización médica avanzada: representación do movemento, reconstrucción de estruturas, etc. | AJ1 | BJ2 | CJ1 |
|                                                                                                                                    | AJ3 | BJ5 | CJ3 |
|                                                                                                                                    | AJ4 | BJ6 | CJ6 |
|                                                                                                                                    |     | BJ7 | CJ8 |

| Contents                                         |                                                         |
|--------------------------------------------------|---------------------------------------------------------|
| Topic                                            | Sub-topic                                               |
| Fundamentos de Visión Dinámica                   | Detección e Análise de movemento<br>Rexistro temporal   |
| Segmentación baseada en modelos                  | Contornos Activos<br>Level Sets<br>Modelos volumétricos |
| Técnicas de visualización para o soporte clínico | Modelos de visualización<br>Aplicacións                 |

| Planning                                                                                                                        |                               |                      |                               |             |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests                                                                                                           | Competencies                  | Ordinary class hours | Student?s personal work hours | Total hours |
| Laboratory practice                                                                                                             | A3 A4                         | 10                   | 20                            | 30          |
| Oral presentation                                                                                                               | B1 B2 B5 B6 B7 C1<br>C3 C6 C8 | 3                    | 21                            | 24          |
| Objective test                                                                                                                  | A1 A2 A3 A4                   | 1                    | 0                             | 1           |
| Guest lecture / keynote speech                                                                                                  | A1 A2 A3 A4                   | 8                    | 12                            | 20          |
| Personalized attention                                                                                                          |                               | 0                    |                               | 0           |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |                               |                      |                               |             |

| Methodologies                  |                                                                                        |
|--------------------------------|----------------------------------------------------------------------------------------|
| Methodologies                  | Description                                                                            |
| Laboratory practice            | Boletines específicos para os temas presentados nas clases maxistrais                  |
| Oral presentation              | Presentación do traballo feito sobre unha metodoloxía de visualización médica avanzada |
| Objective test                 | Exámen escrito para a avaliación dos coñecementos adquiridos                           |
| Guest lecture / keynote speech | Presentación dos temas e desenvolvemento dos conceptos relacionados coa materia        |

| Personalized attention |                                                                 |
|------------------------|-----------------------------------------------------------------|
| Methodologies          | Description                                                     |
| Oral presentation      | Apoio para o desenvolvemento de contidos e a súa sintetización. |

| Assessment |
|------------|
|------------|



| Methodologies       | Competencies                  | Description        | Qualification |
|---------------------|-------------------------------|--------------------|---------------|
| Laboratory practice | A3 A4                         | Prácticas          | 15            |
| Oral presentation   | B1 B2 B5 B6 B7 C1<br>C3 C6 C8 | Exposición pública | 25            |
| Objective test      | A1 A2 A3 A4                   | Exame              | 60            |

#### Assessment comments

| Sources of information |  |
|------------------------|--|
| Basic                  |  |
| Complementary          |  |

#### Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

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.