



## IDENTIFYING DATA

### Quantum computing architectures

|                     |                                                                                                                                                                                                                                                                                                                                           |          |      |            |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|------------|
| Subject             | Quantum computing architectures                                                                                                                                                                                                                                                                                                           |          |      |            |
| Code                | V05M198V01120                                                                                                                                                                                                                                                                                                                             |          |      |            |
| Study programme     | (*)Máster Universitario en Ciencia e Tecnoloxías de Información Cuántica                                                                                                                                                                                                                                                                  |          |      |            |
| Descriptors         | ECTS Credits                                                                                                                                                                                                                                                                                                                              | Choose   | Year | Quadmester |
|                     | 3                                                                                                                                                                                                                                                                                                                                         | Optional | 1st  | 1st        |
| Teaching language   |                                                                                                                                                                                                                                                                                                                                           |          |      |            |
| Department          |                                                                                                                                                                                                                                                                                                                                           |          |      |            |
| Coordinator         |                                                                                                                                                                                                                                                                                                                                           |          |      |            |
| Lecturers           | Fernández Veiga, Manuel                                                                                                                                                                                                                                                                                                                   |          |      |            |
| E-mail              |                                                                                                                                                                                                                                                                                                                                           |          |      |            |
| Web                 | <a href="http://guiadocente.udc.es/guia_docent/index.php?centre=614&amp;ensenyament=614551&amp;assignatura=614551022&amp;any_academic=2023_24&amp;any_academic=2023_24">http://guiadocente.udc.es/guia_docent/index.php?centre=614&amp;ensenyament=614551&amp;assignatura=614551022&amp;any_academic=2023_24&amp;any_academic=2023_24</a> |          |      |            |
| General description |                                                                                                                                                                                                                                                                                                                                           |          |      |            |

## Training and Learning Results

|      |                                                                                                                                                                                                                                                                                                                                                  |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Code |                                                                                                                                                                                                                                                                                                                                                  |
| A9   | Know and know how to apply advanced aspects of quantum computing: quantum learning, efficient quantum architecture, mode of operation of two quantum accelerators, high-performance computing, quantum systems based on rules and applications to numerical calculation.                                                                         |
| A10  | Know scenarios of practical application of quantum computing in problems of scientific, technological and financial interest. Identify domains that exhibit quantum advantage. Know the institutions and companies that are actors in quantum computing, acquiring a perspective of the agenda that is reasonable to expect in the coming years. |
| B4   | To have knowledge of quantum computing, algorithms, circuits, its programming in different languages and accessible platforms.                                                                                                                                                                                                                   |
| B16  | To have knowledge of quantum computer architectures, different platforms and "full stack".                                                                                                                                                                                                                                                       |
| C1   | To analyze and break down a complex concept, examine each part and see how they fit together                                                                                                                                                                                                                                                     |
| C2   | To classify and identify types or groups, showing how each category is different from the others                                                                                                                                                                                                                                                 |
| C3   | To compare and contrast and point out similarities and differences between two or more topics or concepts                                                                                                                                                                                                                                        |

## Expected results from this subject

| Expected results from this subject | Training and Learning Results                                                                    |
|------------------------------------|--------------------------------------------------------------------------------------------------|
| New                                | A14<br>A9<br>A10<br>B18<br>B18<br>B4<br>B18<br>B18<br>B18<br>B16<br>C1<br>C2<br>C18<br>C3<br>D18 |

## Contents

|       |
|-------|
| Topic |
|-------|

| Planning                                                                                                                      |               |                               |             |
|-------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
|                                                                                                                               | Class hours   | Hours outside the classroom   | Total hours |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |               |                               |             |
| Methodologies                                                                                                                 |               |                               |             |
|                                                                                                                               | Description   |                               |             |
| Personalized assistance                                                                                                       |               |                               |             |
| Assessment                                                                                                                    |               |                               |             |
| Description                                                                                                                   | Qualification | Training and Learning Results |             |
| Other comments on the Evaluation                                                                                              |               |                               |             |
| Sources of information                                                                                                        |               |                               |             |
| Basic Bibliography                                                                                                            |               |                               |             |
| Complementary Bibliography                                                                                                    |               |                               |             |
| Recommendations                                                                                                               |               |                               |             |