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**Title of the course**

- **230501 Design of the research plan of a doctoral thesis in engineering**

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**Organizing center/area leading the course**

Deusto International Research School (DIRS) – PhD program in Engineering for the Information Society and Sustainable Development

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**Training category**

AF7. Methodology and research techniques

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**Professor/Coordinator of the training course**

Coordinator: Pablo Garaizar Sagarminaga

Lecturers: Hugo Landaluce, Pablo García Bringas, Diego López-de-Ipiña, Pablo Garaizar Sagarminaga

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**Priority group**

First year PhD students

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**Competences**

SPECIFIC COMPETENCE SC1. Select the research methodology and bibliographic resources most suitable to the topic of a given PhD dissertation.

SPECIFIC COMPETENCE SC2. Apply qualitative and quantitative methods to undertake research in Engineering.

SPECIFIC COMPETENCE SC3. Develop a feasible research plan to tackle successfully a PhD dissertation in Engineering.

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**Pre-requisites / prior knowledge**

Awareness of research in Engineering

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**Contents**

**Unit 1. Introduction to PhD in Engineering** (7 hours – Diego López de Ipiña). Features of a PhD in Engineering. Research methodologies applied to Engineering. Components of a PhD dissertation in Engineering. Lessons learned from previous dissertations in Engineering. Scientific indicators and impact publications in Engineering.

**Unit 2. Qualitative methods** (5 hours – Hugo Landaluce). Research methodologies based on experimentation applied to Engineering. Strengths and weaknesses of a scientific publication which describes an experimentation.

**Unit 3. Quantitative methods** (5 hours – Pablo García Bringas). Quality metrics and quantitative sample and data to undertake research in Engineering. Methods and tools to validate and handle data.

**Unit 4. Research plan preparation** (10 hours – Enrique Onieva). Hypothesis formulation and thesis objectives. Bibliographic revision. Methodology to apply: phases, tasks and chronogram for its elaboration.

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**Level of the course**

Introductory

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**Methodology**

Next, the methods and techniques used during the course are summarized and the research strategy is defined:

- *Lecture*. The lecturer presents the contents of the course in a detailed and organized manner, within the lecture room. The contents, available during the lectures, will be made available in advance to the students (as slides) and classified by units.
- *Individual work*. The students will have to develop a research plan for their PhD dissertation in Engineering, clearly stating what they will do, how and when, during the following three years, in order to achieve a PhD dissertation which meets the expectations and components of a high quality dissertation.

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**Language of instruction**

English

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**Mode of instruction**

In-class

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**Number of places**

PhD students: 30

Personnel: 10

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**Assessment**

Submission of a PhD dissertation research plan which meets the quality criteria set by the PhD programme in Engineering.

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**Number of hours**

27 hours

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## **Bilbao Campus**

- Month when the course begins: November 2023
- Dates and time:
  - Monday, 13 November 2023 (15:00-18:00)
  - Tuesday, 14 November 2023 (15:00-18:00)
  - Wednesday, 15 November 2023 (15:00-18:00)
  - Thursday, 16 November 2023 (15:00-18:00)
  - Monday, 20 November 2023 (15:00-18:00)
  - Tuesday, 21 November 2023 (15:00-18:00)
  - Wednesday, 22 November 2023 (15:00-18:00)
  - Thursday, 23 November 2023 (15:00-18:00)
  - Monday, 27 November 2023 (15:00-18:00)