Teaching Guide				
Identifying Data				2023/24
Subject (*)	Methodology of the Scientific Research		Code	730547007d
Study programme	Máster Universitario en Eficiencia Enerxética e Sustentabilidade (a distancia)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	1st four-month period	First	Optional	3
Language	SpanishGalician			
Teaching method	Non-attendance			
Prerequisites				
Department	Ciencias da Computación e Tecnoloxías da InformaciónEnxeñaría Industrial			
Coordinador	Sanchez Maroño, Noelia	E-mail	noelia.sanchez@udc.es	
Lecturers	Calvo Rolle, Jose Luis Sanchez Maroño, Noelia	E-mail	jose.rolle@udc.es noelia.sanchez@udc.es	
Web	campusvirtual.udc.gal			
General description	The aim of this course is to provide an overview of the world of research. The knowledge taught allow students to know the context related theoretical and applied research work and acquire some basic skills to find quality information, writing and presenting research results.			

Study programme competences	
Code	Study programme competences
B1	CB6 - Possess and understand knowledge that provides a foundation or opportunity to be original in the development and/or application of ideas, often in a research context
B7	CG2 - Develop analysis and synthesis skills; encourage critical discussion, defending arguments, and drawing conclusions
B10	CG5 - Boost creativity
C1	CT1 - Express themselves correctly, both orally and in writing, in the official languages of the autonomous community
C4	CT4 - Develop for the exercise of a respectful citizenship with the democratic culture, human rights and the gender perspective
C7	CT7 - Develop the ability to work in interdisciplinary or transdisciplinary teams, to offer proposals that contribute to sustainable environmental, economic, political and social development
C8	CT8 - Value the importance of research, innovation and technological development in the socioeconomic and cultural progress of society
C9	CT9 - Have the ability to manage time and resources: develop plans, prioritize activities, identify criticism, set deadlines and meet them

Learning outcomes			
Learning outcomes	Study programme competences		
Have a general vision of research in the university field, delving into the main lines in the field of engineering		BC1	CC1 CC4 CC8
Know what is expected of a doctoral thesis, how it is written and how it is presented		BC7	CC4 CC7 CC9
Perform searches for quality scientific-technical references in various sources		BC7	
Know the main scientific discussion forums and their usual operation in relation to sending papers, review, etc.		BC1	
Know what is expected of a doctoral thesis, how it is written and how it is presented		BC1 BC10	CC4 CC8 CC9
Write articles of a scientific-technical nature and present them appropriately		BC10	CC1 CC9

Contents

Topic	Sub-topic
8. Transfer of knowledge to industry and exploitation of results.	8.1. Patent licensing. 8.2. Creation of technology-based companies: spin-off. 8.3. Contract research and cooperative.
1. Scientific and technological research	1.1. The research concept. 1.2. Taxonomy of research. 1.3. Characteristics of scientific research. 1.4. Ethical aspects of research.
2. The research methodology.	2.1. Steps of the research process. 2.2. Main research methods.
3. The dissemination of research.	3.1. Types of publications. 3.2. Patents.
4. Management and search of scientific and technical references.	4.1. Information sources. 4.2. How to literature searches. 4.3. Tools for finding references. 4.4. Tools for managing references. 4.5. Introduction to citation indexes.
5. Drafting and presentation of scientific papers in the field of engineering.	5.1. Basic resources for scientific work. 5.2. The structure of a scientific paper. 5.3. Techniques for writing scientific papers. 5.4. Preparation of presentations of scientific papers.
6. Research projects and innovation.	6.1. Conception and planning of a research project. 6.2. essential elements of a research project. 6.3. Types of calls for research projects and innovation.
7. Development of a doctoral thesis.	7.1. What is a doctoral thesis?. 7.2. Selecting a new line or research problem.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Supervised projects	B1 B7 B10 C1 C7 C9	0	49	49
Mixed objective/subjective test	C1 C4	1.5	1.5	3
Document analysis	B1	0	4	4
Online discussion	C1 C8	3	3	6
Workbook	B1 C8	0	10	10
Objective test	B7 C4	1.5	1.5	3
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
Supervised projects	Development work on writing scientific articles, presentations at scientific-technical work and preparation of reports of research projects.
Mixed objective/subjective test	Realization of short questionnaires to see if knowledge of a specific topic has been acquired
Document analysis	Search and analyze different documentary sources (articles, doctoral dissertations, etc.)
Online discussion	Structured conversation with teachers and students to face two or more opinions about a certain controversial or debatable topic from different points of view

Workbook	Reading of selected documents to acquire specific knowledge of a certain topic or subject
Objective test	It will consist of theoretical and practical on any of the items included in the agenda of the current issues.

Personalized attention	
Methodologies	**Description**
Supervised projects	Student advice and assistance in tasks that require personal attention and resolution of doubts in their development will take place. Apart from teaching hours, attention is maintained in the official tutoring hours through the following channels: - Email: Of use to make short answer queries. - Teams: virtual meetings preferably upon request via email.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Objective test	B7 C4	Objective exam. It is necessary to exceed 50% of the score in the objective test to pass the subject.	50
Mixed objective/subjective test	C1 C4	Fill in the questionnaires, in time and form, established within the framework of this methodology.	10
Supervised projects	B1 B7 B10 C1 C7 C9	Realization of the tasks, in time and form, established in the matter within the framework of this methodology. To pass the subject is essential to have made and approved the "supervised projects". As part of the "supervised project" issues such as school attendance, personal work, proposed personal work, attitude, etc., to help obtaining approved will be included.	40

Assessment comments
For the second and extraordinay opportunities, students may resubmit those "supervised projects" not presented during the course, in any case it is possible to submit any project to obtain a better grade. If the project requires oral presentation, it will be done the same day of the objective test. The fraudulent performance of tests or assessment activities, once verified, will directly involve the qualification of failed in the call in which it is committed: the student will be qualified with "Failed" (numerical grade 0) in the corresponding call of the academic year, both if the offense is committed in the first opportunity as in the second. If necessary, the qualification will be modified in the first opportunity report To help achieve a sustainable immediate environment and meet the objective of action number 5: "Teaching and research healthy and sustainable environmental and social" of the "Plan of Action Green Campus Ferrol": 1.- The delivery of the documentary works that are carried out in this subject: 1.1. It will be requested in virtual format and / or computer support 1.2. It will be done through Moodle, in digital format without needing to print them 1.3. To be made on paper: - Plastics will not be used. - Two-sided prints will be made. - Recycled paper will be used. - Drafts print will be avoided.

Sources of information	
Basic	- Michael Jay Katz (2009). From Research to Manuscript: A Guide to Scientific Writing (2ª edición). Springer - José Cegarra Sánchez (2013). Metodología de la investigación científica y tecnológica. Ediciones Díaz de Santos - Roberto Hernandez-Sampieri (2014). Metodología de la investigación (6ª Edición). McGraw-Hill

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.