UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				**2017/18**
Subject (*)	Methodology of the Scientific Research		**Code**	770523006
Study programme	Mestrado Universitario en Eficiencia e Aproveitamento Enerxético			
Descriptors				
Cycle	**Period**	**Year**	**Type**	**Credits**
Official Master's Degree	1st four-month period	First	Optativa	3
Language	SpanishGalicianEnglish			
Teaching method	Face-to-face			
Prerequisites				
Department	ComputaciónEnxeñaría Industrial			
Coordinador	Sanchez Maroño, Noelia	**E-mail**	noelia.sanchez@udc.es	
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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**
B3	Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación.
B7	Desarrollar las capacidades de análisis y síntesis; fomentar la discusión crítica, la defensa de argumentos y la toma de conclusiones.
B10	Potenciar la creatividad.
C1	Adquirir la terminología y nomenclatura científico-técnica para exponer argumentos y fundamentar conclusiones.
C4	Desarrollar el pensamiento crítico

Learning outcomes		
Learning outcomes	**Study programme competences**	
An overview of research at the university level, deepening the main lines in the field of engineering.	BC3	CC1
Knowing the work of management in research, especially in relation to applications for research projects in various fields.	BC7	
Know the main forum for scientific discussion and its normal operation regarding abstract submission, review, etc.	BC3	
Search for quality scientific and technical references in various sources.		CC1
Write articles with scientific and technical nature and present them properly.	BC10	CC4
Knowing what is expected of a doctoral dissertation, how is written and how it is presented.	BC10	CC1
		CC4

Contents	
Topic	**Sub-topic**
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.
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.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	B3 C1	9	9	18
Case study	B7 C4	12	12	24
Supervised projects	B10 C4	0	25	25
Oral presentation	B7 C4	1	3	4
Objective test	B3 B7 C4	3	0	3
Personalized attention		1	0	1
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Guest lecture / keynote speech	Oral presentation complemented with the use of audiovisual media and the introduction of some questions to students, in order to transmit knowledge and facilitate learning.
Case study	They are mandatory for all students. It involves the resolution of cases. The student's done individually.
Supervised projects	Development work on writing scientific articles, presentations at scientific-technical work and preparation of reports of research projects.
Oral presentation	For some supervised project, students should prepare an oral presentation where they present their work in the classroom, highlighting the main contributions and conclusions.
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 Case study	Student advice and assistance in tasks that require personal attention and resolution of doubts in their development will take place.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Supervised projects	B10 C4	Tasks in a timely manner, established in the area in the framework of this methodology.	40

| Oral presentation | B7 C4 | It would be included in some supervised project and it would affect the final grade of the project, however it is not graded on its own. | 0 |
| Objective test | B3 B7 C4 | Exam objective type test. | 60 |

Assessment comments
To pass the subject is essential to have made and approved the Care JobsAs part of the "protected work" issues such as school attendance, personal work, proposed personal work, attitude, etc., to help obtaining approved will be included.It is necessary to exceed 50% of the score in the objective test to pass the subject.The rating corresponds to "protected works" may range between 20% indicated and 40%, consequently the "objective test" may vary between 60% and 80% indicated.

Sources of information	
Basic	- 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 - Michael Jay Katz (2009). From Research to Manuscript: A Guide to Scientific Writing (2ª edición). Springer
Complementary	? Li, V.O.K. ?Hints on writing technical papers and making presentations?, IEEE Transactions on Education, May 1999, pp. 134-137? Francisco Herrera (2013). Algunas ideas sobre investigación (reflexiones y consejos): Tesis doctoral, metodología de la investigación y escritura de artículos científicos:http://sci2s.ugr.es/sites/default/files/files/TutorialsAndPlenaryTalks/SEMATICA-2013-Algunas_ideas_sobre_la_investigacion.pdf? Alberto Prieto (2014). Cómo realizar una publicación de investigación:http://atc.ugr.es/pages/personal/propia/alberto_prieto/conferencias_pdfs/publicacion_cientifica/!? Alban Alencar, A.: (2007). Manual de oratoria, Edición electrónica gratuita. Texto completo en: http://www.eumed.net/libros-gratis/2007b/302/? Aspectos generales de cualquier presentación: https://media.upv.es/player/?id=98096b63-7ad7-be46-b921-595407dc0d51? Alberto Prieto. Como presentar oralmente un trabajo científico:http://citic.ugr.es/pages/formacion/conferencias/como_presentar_en_publico_untrabajo_cientifico_aprieto/!? Daniel Torres-Salinas, Álvaro Cabezas-Clavijo (2012). Búsquedas en bases de datos de información científica: del rescate de citas a la creación de perfiles:http://citic.ugr.es/pages/formacion/conferencias/busquedaenbasesdedatosdocumentales/

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.