

## 60432 - Scientific and technical communication skills

### Información del Plan Docente

<b>Academic Year</b>	2016/17
<b>Academic center</b>	100 - Facultad de Ciencias
<b>Degree</b>	541 - Master's in Geology: Techniques and Applications
<b>ECTS</b>	6.0
<b>Course</b>	1
<b>Period</b>	First semester
<b>Subject Type</b>	Compulsory
<b>Module</b>	---

### 1. Basic info

#### 1.1. Recommendations to take this course

The present subject, by its instrumental and transversal character, aims to develop diverse and different abilities in the students. Some of them will surely be already partly acquired, as the students are supposed to have fulfilled a University degree. Therefore, such basic skills as dealing with bibliographic information; oral, written and graphic expression, as well as basic knowledge of English, are intended to be developed more in detail. The mainly practical character of the course requires active participation of the student in all programmed activities.

#### 1.2. Activities and key dates for the course

- First week of October: Beginning of lectures and sessions.
- Second, third, fourth and seventh week: Delivery of (parcial) practical works.
- Third week of December: End of ordinary teaching sessions.
- Third week of December: Delivery of the final, written work.
- Second week of January: Oral presentation of the final work.

### 2. Initiation

#### 2.1. Learning outcomes that define the subject

1. Abilities for searching, selecting and processing scientific information from bibliographic (and other) resources.
2. Abilities to select, understand, and summarize scientific information about a certain, chosen topic.
3. Development of oral and written expression abilities on different scientific contents.

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4. Abilities to shape, synthesize, and adapt relevant graphic and audio-visual information relevant for the communication of scientific contents on a certain scientific topic.
5. Practical knowledge of communication mechanisms inside the scientific community.
6. Abilities to elaborate and write a scientific work.

### 2.2.Introduction

The subject has an instrumental and "transversal" character in relation to other topics of the Master Title. It intends to develop some skills of handling with information, expression and communication within the scientific community, which are needed to develop any research or professional activity for the students to be developed in the future

It basically consists of a series of theoretical and practical scientific sessions in which the students will try to improve the acquired skills. On the basis of brief introductions by the professors, the student will shape a short scientific work of his choice. Such selected work will be completed and supplemented along the successive sessions of the course, in order to be submitted and presented orally in a sharing session at the end of the course (the end of the semester).

### 3.Context and competences

#### 3.1.Goals

#### 3.2.Context and meaning of the subject in the degree

#### 3.3.Competences

#### 3.4.Importance of learning outcomes

### 4.Evaluation

The student should demonstrate that he has reached the previewed learning results by means of the following evaluation activities:

#### a) PARTIAL PRACTICAL WORKS:

a.1) Selection and processing of bibliographic information on a freely selected topic. Elaboration of a selected reference list.

a.2) Elaboration of a script, or a conceptual framework ("conceptual map") of the selected topic. Brief oral presentation (in Spanish).

a.3) Lecturing and underlining of a selected English paper. Redaction of a brief critical comment (in Spanish).

a.4) Redaction of a preliminary Abstract (in English) of the personal, shaped work.

a.5) Preparation and updating, by means of adequate informatic tools, of a Plate including both pictures and line drawings

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susceptible to be included in it as personal work.

### b) PERSONAL SCIENTIFIC WORK:

b.1) Final written work (in English). Four page manuscript in the format of the template of the Journal *Geotemas*.

b.2) Oral presentation of the final work, with graphical support on screen.

### EVALUATION CRITERIA:

- Partial practical work (activities a.1 to a.5): 30 %

- Final written work (activity b.1): 50 %

- Final oral presentation (activity b.2): 20 %

## 5. Activities and resources

### 5.1. General methodological presentation

The methodology is based on practical learning and development of a series of technical abilities and skills. This is intended to be acquired in a series of theoretical-practical, 2,5-hour lasting sessions.

The practical part will be almost exclusively devoted to the personal work of the students, shaping a series of partial works leading to a final personal work. This final work will be presented both as a written contribution in the shape of the template of the journal *Geotemas*, and orally, in a seminar session in front of the other companions and teachers.

### 5.2. Learning activities

The course includes 12 lessons, each of them developed through one or two theoretical-practical, 2.5-hour lasting sessions in which the students will try to improve the acquired skills.

- Lessons 1, 2, 3, 4 and 7 involve short practical works for students. Most of them will represent partial tasks that will be completed and supplemented along the successive sessions in order to accomplish the personal scientific work. They should be written and delivered, as a general rule, before the day previous to the next session.

- Lesson 2 also includes an oral presentation.

- After sessions corresponding to lessons 1-11, the student should deliver the final written scientific work of his/her choice.

- The personal scientific work will be presented orally in a sharing session at the end of the semester.

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### 5.3.Program

1. Introduction: Communication abilities in the scientific community. Practical analyses of some selected cases. Selection and use of documentary (bibliographic and other) sources. Searching and handling strategies. Dealing with bibliographic references.
2. Structuring the information. Syntheses and Abstracts; conceptual maps. Oral expression (in Spanish)
3. Written expression in Spanish. Style and structure of scientific writing: lexical, orthography, punctuation, syntax and structure of a scientific text. Writing exercises and correction of the most common errors.
4. Written expression in English. Style and structure of scientific writing: lexical, orthography, punctuation, syntax and structure of a scientific text. Writing exercises and correction of the most common errors.
5. Organizing and writing a scientific paper in English. Title, key-words, abstract, description, interpretation, discussion, conclusions, graphics, bibliography. Case analyses.
6. Graphic expression (I). The graphic style in Geology: maps, stratigraphic successions, legends, field drawings, Informatic tools for the treatment of images and photographs. Case analyses.
7. Graphic expression (II). Drawings in Geology. Informatic tools for scientific drawings. Case analyses.
8. Graphic expression (III). Informatic tools for the graphic support of oral presentations. Case analyses.
9. Social structure of Science: communication in the scientific community. Papers and scientific meetings. Control and evaluation mechanisms; peer reviewing. The scientific controversies.
10. Organizing and shaping a technical report. Some particular cases of reports for mining and constructing projects. Reports on environmental and heritage impact. Case analyses.
11. Scientific communication in culture. Scientific and social spread of science. The case of geological heritage. Case analyses.
12. Oral communication in English. General rules and features. Oral presentations with graphic support on screen.

### 5.4.Planning and scheduling

- The 12 lessons are developed through 20-22 theoretical-practical, 2.5-hour lasting sessions along the semester.
- Partial practical works corresponding to lessons 1, 2, 3, 4 and 7 are made during weeks 2nd, 3th, 4th and 7th, and delivered, as a general rule, before the day previous to the next session.
- Lesson 2 includes an oral presentation.

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- The final written scientific work is delivered after developing lessons 1-11, at the third week of december.
- The oral presentation of the personal scientific work takes place at the second week of january.

### 5.5. Bibliography and recommended resources

#### BASIC BIBLIOGRAPHY:

1) *La redacción en inglés de trabajos sobre Ciencias de la Tierra (I): Programa, conceptos y textos básicos* . G. Meléndez. Departamento de Publicaciones, Universidad de Zaragoza. 2014.

2) *Curso de redacción de trabajos científicos en inglés (II) Sesiones docentes* . Versión editada en pdf. G. Meléndez. Universidad de Zaragoza. 2014.

3) *Manual de estilo para la redacción de textos científicos y profesionales* . X. Fuentes Arderiu, F. Antoja Ribó y M.J. Castiñeiras Lacambra. Sociedad Española de Bioquímica Clínica y Patología Molecular

<http://www.bio-nica.info/biblioteca/Fuentes&Antoja.pdf>

#### COMPLEMENTARY BIBLIOGRAPHY:

1) *Scientific Research II: The Search for Truth*. M. Bunge, Springer, New York, 373 pp. 1967.

2) *The Structure of Scientific Revolutions* . T. S. Kuhn, 4th edition, University of Chicago Press, Chicago-London, 216 pp. 2012.

3) *Conceptual Foundations of Scientific Thought: An Introduction to the Philosophy of Science* . M.W. Wartofsky, Macmillan Company, Toronto, 560 pp. 1968.

4) *The Logic of Scientific Discovery* . K.R. Popper. Routledge, Oxford, 544 pp. 2002.

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5) *The Sociology of Science - Theoretical and Empirical Investigations*. R.K. Merton. University of Chicago Press, Chicago-London, 636 pp. 1973.

6) *Reliable Knowledge: An exploration of the grounds for belief in science*. J. Ziman. Cambridge University Press, 199 pp. 1978.

7) *Aprender a razonar*. M. J. Pizarro, Biblioteca de recursos didácticos Alhambra (BREDA). 137 pp. 1987.

8) *How to reply to peer review comments when submitting papers for publication*. H.C. Williams H.C. Journal of the American Academy of Dermatology, 51, 79-83, 2004. [http://eprints.nottingham.ac.uk/859/2/How\\_to\\_reply\\_to\\_referees.pdf](http://eprints.nottingham.ac.uk/859/2/How_to_reply_to_referees.pdf)

9) El lenguaje visual-gráfico en Geografía. R. Fernández, Univ. Mendoza, 2007.

[www.fao.org/nr/lada/index.php?option=com\\_docman&task=doc\\_download&gid=495&Itemid=165](http://www.fao.org/nr/lada/index.php?option=com_docman&task=doc_download&gid=495&Itemid=165)

### WEB SITES:

1) <http://www.uottawa.ca/academic/arts/writcent/hypergrammar>

2) <http://www.editage.com/insights/how-to-respond-to-comments-by-peer-reviewers>