

COURSE SYLLABUS

1. COURSE DESCRIPTION

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| Degree: | Geography and History |
| Double Degree: | |
| Course: | History of Science |
| Module: | Additional training in the field of Arts and Humanities |
| Department: | Geography, History and Philosophy |
| Term: | 1 |
| Total Credits: | 6 |
| Year: | 4º |
| Type of Course: | Optional |
| Course Language: | General/background: Spanish Theory-into-practice/developmental knowledge-building: English |

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| Teaching model: | A1 | |
| a. General/background: | | 70% |
| b. Theory-into-practice/developmental knowledge-building | | 30% |
| c. Guided Academic Activities: | | |

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2. COURSE COORDINATOR

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| Name: | Cinta Canterla González |
| Faculty: | Faculty of Humanities |
| Department: | Geography, History and Philosophy |
| Academic Area: | Philosophy |
| Category: | Professor (Catedrática de Universidad) |
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3. ACADEMIC CONTEXT

3.1. Course Description and Objectives

The aim of this subject is to trace the historic genealogy of contemporary scientific and philosophical knowledge, showing how the intellectual concepts that are part of our cultural heritage today emerged. Within this context, and given the limitations of being a subject worth six credits, the essential core of the subject taught should revolve around the Scientific Revolution, progressively studying:

- a) The previous preparatory period (Greek philosophy and science; its recovery in the Middle Ages through Arab philosophy and science, and the work carried out by the Toledo School of Translators; and the development of Aristotelian physics and cosmology in the late Scholastic period).
- b) The Revolution itself (in its first phase, initiated with the development of experimentation by the Oxford Aristotelians in the late Middle Ages; and its second phase, which begins with anti-Scholasticism and Renaissance experimentalism, reaching a pinnacle with Copernicus, Kepler and Galileo, and develops subsequently through the philosophy of rationalist and empiricist science up to Newtonian science and its Kantian foundations).
- c) The subsequent transformations it sparks in science and philosophy up to the 20th Century.

The unifying thread running through the subject shows the development of philosophical and scientific thought in Europe as something coherent and continuous beyond the usual fragmentations found in the ancient, the mediaeval, the modern and the contemporaneous. The aim is for students to understand that this thread stretches right up to the present day and that this way of thinking is contingent and not necessary, has a historical origin and can be explained in its genesis. In short, the purpose of this subject is to provide students with exhaustive knowledge of the changes that have occurred in Europe in relation to the conception of science and rationality, as well as investigation techniques in the history of science, so that they are competent in this field of work with regard to their professional future, and aware of the social implications of science.

To achieve these cognitive and attitudinal objectives, Spanish is used as the language of communication for basic teaching, and English for audiovisual practical sessions, to give students bilingual teaching credits enabling them to complete between 60 and 120 ECTS credits in English if they wish, so they can obtain the accreditation in bilingual teaching.

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3.2. Contribution to the Training Plan

This subject, which provides students with tools for independent and critical learning regarding knowledge of the major genetic lines present in the History of Science, contributes to the priority objective of the course, described on page 14 of its Memorandum of Verification (emphasising the aspects indicated in italics):

“Achieve *rational and critical knowledge* of the spaces and territories that make up the planet, as well as the *knowledge and processes that shaped Humanity’s past*, and interrelate these geographical and historical realities, *in order to understand the present and its complexity, value territorial and cultural diversity as wealth, commit to the transformation of inequalities and make all of this understandable to others*”.

The optional subject History of Science, due to its working system, enables students to enhance their training in skills that capacitate them to access, use and effectively and efficiently manage information: search skills, selection, critical analysis, rewriting and communicating information from multiple sources; all these skills are also described among the objectives for the Degree in Geography and History. Furthermore, by showing the interrelations between the history of science and technology, in its different historical and geographical contexts, and other cultural productions, it also reinforces the student’s basic training in interdisciplinary contents related to knowledge of the diachronic structure of the past, space-time coordinates, geographical interrelations, as well as cultural and artistic heritage.

Furthermore, the teaching delivered in English as part of this subject helps to facilitate the international mobility of students: subsequently moving towards universities offering Masters’ and Doctoral Programmes in English; in the professional market, facilitating their professional integration in other countries. But also making graduates more versatile when it comes to finding work in Spain, for example, as possible teachers of bilingual teaching programmes in public primary and secondary schools within Andalusia (where this is a primary objective in the region’s current education policy), or working in the audiovisual communication sector, in the world of publishing, the press or as documentalists in companies, archives or libraries, as well as all kinds of activities related with international cooperation and the management of international projects.

And, finally, owing to the special characteristics of philosophy (the history of science is also at the same time the history of philosophy, at least until the Scientific Revolution, and even after that it continued to be forged in close correlation) as rational, critical and reasoned knowledge, aware of the interrelation between current problems and their diachronic genesis, and the global nature of collective heritage (in which the values of democracy are also found), the subject presented by this Teaching Guide also contributes to the purpose of the Degree in Geography and History, described on page 4 of its Memorandum of Verification:

“The solid interdisciplinary and global training provided is the best guarantee that this study programme will train people to have sufficient resources to tackle and understand the complex reality that characterises contemporary society and the dynamics that have shaped it from multiple angles, and with sufficient perspective to offer a transversal and multidisciplinary approach to said reality. Its basic aim is that graduates from this



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programme will be capable of understanding problems in a multidimensional way and making decisions grounded in their knowledge of the space in which they live, its history, thought, and artistic experiences. People equipped with the skills required to understand and interpret written texts, images and maps in a reasoned manner; capable of adequately managing all kinds of information and of putting forward and justifying their arguments in public; people who are, in short, confident of their capacities, but respectful of dissenting opinions. The aim is to train future high performing professionals, capable of evolving and adapting to the changes occurring in our time, and capable of giving new uses to traditional knowledge”.

3.3. Recommendations or Prerequisites

Essential: Basic level of English (A2). Recommended: Level B1 in English

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4. SKILLS

4.1 Degree Skills Developed during this Course

Generic:

1. Development of linguistic competence in Spanish and in English.
4. Decision making in order to adapt to new situations and solve problems. Development of self-criticism and critical awareness in order to assess and optimise the learning process.
7. Autonomous information search and Management promoting intellectual rigour.

Specific:

Disciplinary:

12. Knowledge of the general diachronic structure of history and capacity to describe the relevant historical periods, their inner subdivisions with respect to the different criteria of political, economic, social, religious or cultural history.
35. Knowledge of the different philosophical schools and their contribution to the general theory of knowledge, especially in relation to the Humanities and the Social Sciences.

Professional:

37. Oral and written communication in Spanish and in English using specific terminology and techniques which are commonly accepted among professionals in the field.

Academic:

63. The development of self-critical awareness by thinking and judging individually, improving the capacity to understand and question the world and its problems as well as promotion of reflection on values and favourable attitudes towards peace and dialogue among civilizations.
64. Criticism and self-criticism of prejudices and antidemocratic ideologies, adopting an attitude of respect towards differences and criticism of all attempts to justify social inequalities and any kind of discrimination, either because of gender, ethnic group, culture, beliefs or other individual and social characteristics.
65. Knowledge and promotion of Human Rights, as well as the democratic principles of equality among men and women, solidarity, environmental preservation, universal accessibility and design for all and promotion of peace culture.

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4.2. Module Skills Developed during this Course

Generic:

4. Decision making in order to adapt to new situations and solve problems. Development of self-criticism and critical awareness in order to assess and optimise the learning process.
6. Active learning, showing autonomy, initiative, planning and organization skills, entrepreneurship and creativity.
7. Autonomous information search and management promoting intellectual rigour.

Specific:

Disciplinary:

17. Knowledge of the different philosophical schools and their contribution to the general theory of knowledge, especially in relation to the Humanities and the Social Sciences.
13. Critical awareness of the relationship between the historical knowledge linked to the present problems and the facts of past.

Professional:

19. Elaboration of a research report dealing with a basic topic included in the syllabi of the different subjects, showing the skill of gathering and interpreting relevant data in order to express an opinion or judgement.
23. Oral and written public defence of theses or own points of view before a specialised or non specialised audience, applying acquired knowledge and valuing dialogue and the free expression of ideas in order to enrich, clarify and test one's own viewpoint.

4.3. Course-specific Skills

The specific skills associated with this subject in its planning will help to enable the student to subsequently develop their professional knowledge and expertise. They are:

- C1. Skill in applying research techniques to create the contents of this subject and recover them should they become lost. (Procedural)
- C2. Skill to manage techniques that facilitate learning through the use of English in academic contexts (EAP: English for Academic Purposes) and its subsequent use in academic and professional contexts (Procedural)
- C3. Mature critical awareness regarding the contingent nature of the modes of rationality that currently shape the European mentality and the system of verbal expression itself (Attitudinal)



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C4. Self-critical capacity for bias relating to one's own particular mentality (ideas, beliefs, values, etc.) received without reflection during the education and training received as children and adolescents. (Attitudinal).

In the context of these skills, the practical objectives proposed by this subject are described previously in section 3.1. of this Guide, with a view to developing within the students the ability to:

Objective 1 Draft reports and research articles in Spanish pertaining to the contents of this subject. (C1, C3, C4)

Objective 2 Manage knowledge independently, creatively and critically in multilingual contexts (C1, C2, C3, C4)

Objective 3 Know techniques that facilitate the understanding of lectures, lessons and documentaries in English relating to the contents of this subject. (C1, C2, C3, C4)

Objective 4 Draft essays, brief articles and presentations with slides in Spanish and in English relating to the contents of this subject. (C1, C2, C3, C4).

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5. COURSE CONTENT (COURSE TOPICS)

CONTENT UNIT 1. PHILOSOPHY, SCIENCE AND TECHNOLOGY IN THE ANCIENT WORLD.

CONTENT UNIT 2. SCIENCE IN THE MIDDLE AGES.

CONTENT UNIT 3. THE RENAISSANCE AND THE SCIENTIFIC REVOLUTION.

CONTENT UNIT 4. MODERN SCIENCE AND THE ENLIGHTENMENT.

CONTENT UNIT 5. SCIENCE, TECHNOLOGY AND SOCIETY IN THE 19th CENTURY.

CONTENT UNIT 6. SCIENCE, TECHNOLOGY AND SOCIETY IN THE 20th AND 21st CENTURIES.

6. METHODOLOGY AND RESOURCES

BASIC TEACHING (LANGUAGE: SPANISH)

Objective 1 Draft reports and research articles in Spanish pertaining to the contents of this subject. (C1, C3, C4)

Objective 2 Manage knowledge independently, creatively and critically in multilingual contexts (C1, C2, C3, C4)

Regarding the teaching methodology in basic teaching (BT), the planning of work in this subject is characterised by importing practices from the field of scientific research into the student's activity, with a view to developing autonomous work and the skills required to construct knowledge and innovation.

To achieve this, the subject is divided into content units, each of which is proposed to the student as a research project. Explanations are given about the characteristics of scientific research and the students are told that they are going to conduct what is known as exploratory research, focusing on a specific field that they have no knowledge about, tackled as a project: the specific title of each content unit they are going to complete. Similarly, the process whereby research findings are published is explained (submitted to a specialist journal) and the students are told that we are going to simulate a peer review in which I as a teacher will write a review of each piece of work. The six *Thematic or Content Units* into which this subject is divided are described in the previous section.

For each of these teaching units, the teacher provides a *Keyword* and an *Analytical Contents Index*, so that students can use these like an abstract and the

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contents of a future publication for their research. They are given *six working hours a week* for the subject, establishing a timeline of points corresponding to the research work set out for each week, where two are covered in Basic Teaching in which the teacher sets out the basic contents of the subject matter they will be working on, and one is covered in Practical and Development Teaching, where they work on a specific issue, applying it to a specific problem of modern-day society by means of an audiovisual seminar. The rest of their working hours are dedicated to the student's independent research, following bibliographic recommendations which, for subjects at the initial level are textbooks and a few chosen sources, and for advanced levels are sources and monographic studies. Every week, internet links are activated in the Virtual Classroom corresponding to complementary material available on the web related to the objectives of the research proposed.

Once the period of time allocated in the schedule to a Content Unit is over, the student drafts their piece of writing, starting with an abstract and then developing the initial outline, respecting the contents structure proposed, systematising the findings and submitting the *Research Memorandum* to the teacher.

In the academic field, a *Memorandum* is understood as a didactic sub-genre in which a report is provided of the work carried out within a subject or in relation to an activity in a global way. Memoranda can either focus on the actions carried out or the contents developed. The second kind is used by UPO's Department of Philosophy: *memoranda of contents that reflect the findings of research conducted independently by the student in a specific subject, tackled in the manner of a research problem*. However, the difference between memoranda and reports also resides in the fact that the first are lighter and more schematic, in line with the allocation of just four months for this subject.

To avoid problems of plagiarism and guarantee intellectual property, the Research Memorandum is handwritten and the maximum length is 10 pages (preferably 5 pages). In order to speed up the student's work, the formal framework established is the one set out for *structuring and format* by the authors C. Arroyo and F.J. Gallardo, in their book *Libro de estilo universitario*, establishing a similarity between the Research Memorandum and what they call a "Study Document" to prepare for an exam or evaluation:

"Study Document. The ideal material to prepare for exams is a study document drawn up on the basis of notes, textbooks, additional bibliographic material, lectures, reflections and consultations. The content is very important, but what truly brings added value to the work of a student is the way in which it is structured. The study document is not drafted by simply writing up notes in neat or copying a textbook. Merely copying takes time and gives a false impression of mastering the subject matter. If there is no transformation, there cannot be a true study document.

The structuring and format of the study document depend on the type of subject matter, specific needs and preferences. Among other possibilities, outlines can be drawn up (a kind of contents list to which highly summarised contents are added), summaries (very concisely written texts with the appearance of a normal

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piece of writing), diagrams (flow chart, block diagram, tree diagram), tables, charts, mixed documents (with some sections laid out as outlines and others as diagrams, for example), or a collection of exercise models.

*Working documents are subsequently used to revise for the exam and for quick reference. Preparation for exams is carried out by means of these documents, not using the primary or secondary sources, no matter how underlined and highlighted they might be”.*¹

Once the student has handed in the memorandum, the teacher reads it, corrects it, indicates any gaps, makes suggestions, and returns it to the student, setting up a tutorial either in person or virtually with the student to deal with any specific problems detected, so that the student can apply the improvements and what they have learned when drafting the next one (as indicated previously, the correction of the Memorandum acts as a peer review for research articles submitted to scientific journals). Teaching activity is planned in this way so that between the Memorandum for Content Unit I, the first, and VI, the last one, there is continual, negotiated and reflective progress in the student’s independent work and in the supervision of the student by the teacher.

This system of the independent drafting of contents through Research Memoranda is very useful because it immediately identifies areas in which the student presents previous shortcomings that need to be worked on: problems in reading and writing, shortcomings in prior skills, etc.: difficulties understanding the methodology and contents of the subject are very quickly detected, along with problems of dispersion and lack of planning with regard to the objectives and skills of the subject; similarly, individualised tutoring, either in person or virtually, both during the process of drafting the memorandum and after its correction, allows us to ascertain the professional interests of the students and use their vocation as a means of motivation, and also to awaken interests in students who have not yet found theirs.

PRACTICAL OR DEVELOPMENT TEACHING (LANGUAGE: ENGLISH)

Objective 3 Know techniques to facilitate the understanding of lectures, lessons and documentaries in English relating to the contents of this subject. (C1, C2, C3, C4)

Objective 4 Draft essays, brief articles and presentations with slides in Spanish and in English relating to the contents of this subject. (C1, C2, C3, C4).

Practical classes consist of ten sessions each lasting an hour and a half, with the following planning:

Session 1. Presentation of the objectives of practical and development teaching and working methodology.

Session 2. Presentation and viewing of documentary No. 1.

Session 3. Presentation and viewing of documentary No. 2.

Session 4. Presentation and viewing of documentary No. 3

Session 5. Presentation and viewing of documentary No. 4.

¹ C. Arroyo y F.J. Gallardo, en su obra *Libro de estilo universitario*. Madrid, Acento Ed., 1997. Pág. 512.



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- Session 6. Presentation and viewing of documentary No. 5.
- Session 7. Presentation and viewing of documentary No. 6.
- Session 8. Presentation of student work and peer review.
- Session 9. Presentation of student work and peer review.
- Session 10. Self-assessment of students and evaluation of group objectives.

After each documentary has been shown, the student writes an essay in English of a least one page in length, with 1.5 spacing, New Times Roman font, size 12, about the contents of the documentary seen in class. These documentaries will be available on the WebCT so students can examine them in greater depth at home. A complete practical session involves attending the presentation and viewing of the documentary in class and subsequently drafting the commentary essay. Incomplete or isolated parts of practical sessions will not be assessed or graded.

Student presentations will consist of the student presenting two of their essays about the documentaries in class in English, followed by evaluation by the other students.

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7. ASSESSMENT

In order to monitor and evaluate objectives, activities and skills, this Teaching Guide divides the work into three modules: Attendance-based module (A), Working module in Basic Teaching (B), Working module in Practical and Development Teaching (C). The weightings are as follows: 20% to the first module, 40% to the second, and 40% to the third. The criteria for evaluating the modules (all voluntary but evaluable) are as follows:

Evaluation of Attendance-Based Module (Module A): up to 2 points

- 100% of the evaluation of this module for full attendance of the 45 classroom hours (weekly Basic Teaching and Practical and Development Teaching). Proportionally decreasing evaluation for partial attendance.

Evaluation of the Working Module for Basic Teaching (Module B): up to 4 points.

- Evaluation of *basic teaching* through handwritten *Research Memoranda* (maximum 10 pages, preferably 5 in outline format), one for each of the six content units. Memoranda can be scanned and uploaded to a learning folder in the Virtual Classroom, or handed in to the teacher in class, on the day indicated by the teacher. Maximum score if the six memoranda are submitted and receive the maximum grade (therefore, 0.66 points for each memorandum graded with a 10, and as of then, decreasing evaluation according to the number of memoranda submitted and their grades).

Evaluation of the Working Module for Practical and Development Teaching (Module C): up to 4 points.

- For each practical class completed, 0.66 points. A practical session includes: active attendance of the class; drafting the practical report by the deadline given by the teacher; public presentation of the report. Partial practical sessions are not evaluated.

Exceptional incidents: serious circumstances (illnesses, death of close relatives, etc.) that have an impact on evaluation will be dealt with by the teacher during tutorial hours, having notified the teacher of the problem as soon as it occurs by e-mailing the virtual classroom, substituting the missing work, following a convincing justification by the student, for another piece of work, always written and submitted immediately. This process must be notified and agreed by the student representative for the year (delegate) with a view to guaranteeing equal and fair treatment for all students.

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8. BIBLIOGRAPHY

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