



Teaching Guide

Teaching Guide				
Identifying Data				2016/17
Subject (*)	Química, Información e Sociedade		Code	610G01031
Study programme	Grao en Química			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Second	Obligatoria	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Química AnalíticaQuímica Física e Enxeñaría Química 1			
Coordinador	Penedo Blanco, Francisco Jose	E-mail	francisco.penedo.blanco@udc.es	
Lecturers	Penedo Blanco, Francisco Jose	E-mail	francisco.penedo.blanco@udc.es	
Web				
General description	In this area the main aspects related to the development of Science, sources of scientific information, and the Science, Society and Industry relationship are addressed. A critical and ethical vision of scientific work is the primary objective.			

Study programme competences / results

Code	Study programme competences / results
A16	Ability to source, assess and apply technical bibliographical information and data relating to chemistry
A18	Risk management in relation to use of chemical substances and laboratory procedures
A21	Understanding of qualitative and quantitative aspects of chemical problems
A23	Critical standards of excellence in experimental technique and analysis
A24	Ability to explain chemical processes and phenomena clearly and simply
A25	Ability to recognise and analyse link between chemistry and other disciplines, and presence of chemical processes in everyday life
A28	Acquisition, assessment and application of basic principles of industrial activity, organisation and task management
B2	Effective problem solving
B3	Application of logical, critical, creative thinking
B4	Working independently on own initiative
B5	Teamwork and collaboration
B6	Ethical, responsible, civic-minded professionalism
B7	Effective workplace communication
C3	Ability to use basic information and communications technology (ICT) tools for professional purposes and learning throughout life
C4	Self-development as an open, educated, critical, engaged, democratic, socially responsible citizen, equipped to analyse reality, diagnose problems, and formulate and implement informed solutions for the common good
C5	Understanding importance of entrepreneurship, and knowledge of resources available for people with business ideas
C6	Ability to assess critically the knowledge, technology and information available for problem solving
C7	Acceptance as a professional and as a citizen of importance of lifelong learning
C8	Understanding role of research, innovation and technology in socio-economic and cultural development

Learning outcomes

Learning outcomes	Study programme competences / results		
Know the different mass media for chemical information, throughout history and today.	A16 A24 A25 A28	B3 B7	C6



Know the methods of current and past research, and environmental influences.	A16 A23 A25		C6 C7
Learn to use different means of access to information in chemistry, both written and audiovisual and on-line	A16 A24 A25 A28	B2 B4	C3
Knowing and understanding the different pathways leading to the results in the process of chemical research. Knowing the structure of the various research institutions in today's society	A16 A25 A28	B3 B5 B7	C8
Know, learn and critically evaluate the research ethics and outcome. Know and judge responsible behavior, good praxis. Observe and correct mistakes and negligence in the daily work	A18 A21 A23 A25 A28	B3 B6 B7	C4
Know and understand the relationship between society, science and industry at present and over time, including both the positive momentum as interference.	A24 A25 A28	B2 B3 B6 B7	C4 C5 C8

Contents	
Topic	Sub-topic
SECTION I: Origin and development of research and theories	Topic 1. The beginnings of modern science and chemistry Topic 2. The scientific and chemical revolution Topic 3. Methods of Science Topic 4. Practice of Science
SECTION II: Communication of results	Topic 5. Sources of information Topic 6. Decisions, dissemination and evaluation of results Topic 7. Responsible Science Topic 8. Intellectual property and patents Topic 9. Structure and financing in Science. Scientific Societies Topic 10.-Publications. Popular science
SECTION III: Risks and Benefits of Chemistry and Chemical Industry for the Society	Topic 11.- Science-Technology Interaction. The Chemical Industry. Scientific and military industry.

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student's personal work hours	Total hours
Guest lecture / keynote speech	A16 A18 A21 A25 B6 C4 C7 C8	30	30	60
Workshop	A16 A25 C3 C6	2	3	5
Seminar	A16 A23 A24 B2 B3 B4 B7 C3	8	32	40
Supervised projects	A16 A18 A21 A23 A24 A28 B2 B3 B5 C5 C6	8	32	40
Mixed objective/subjective test	A16 A21 A24 A25 B3 B6 C4 C5 C6 C7 C8	3	0	3
Personalized attention		2	0	2

(*)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	The teacher presents and explains the fundamental concepts of each topic.
Workshop	Two sessions (1 hour each) will be given by the library staff of the Faculty of Science to explain the resources and advanced management in the library.
Seminar	They are interactive small group sessions in which the teacher provides concrete examples related to the keynote speech. Case studies and discussion will take place between students and handling diverse scientific documentation is encouraged. Also, sessions in the computer lab to perform activities of obtaining scientific information using networked databases will be carried out
Supervised projects	In small group sessions, students will solve individual and group problems posed by the teacher, who will supervise the ongoing work of the student. Problems that relate chemistry to the health, food, environment, etc. will be discussed, encouraging student participation. Students shall make a final report and oral presentation of the developed work, supervised by the teacher.
Mixed objective/subjective test	Final exam in which multiple choice questions, short answer and essay are included. It aims to assess the knowledge acquired by the students and their ability to reason, synthesis, writing and critical thinking.

Personalized attention	
Methodologies	Description
Seminar Supervised projects	Throughout all sessions of the small group classes, the tutoring of students will be enhanced, helping to raise doubts and to solve them. Mandatory personal attention (2 hours) will be scheduled throughout the class period, via interactive tests which intend to assess the progress of the student achieving the learning aims of the subject. The students may apply for individual tutorials in the teacher's office in the appropriate schedule. In the specific case of part-time students, or exemption of assistance, seminars and supervised work will be led through interactive online support, email or moodle, with a timing similar to that of small group classes scheduled.

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Seminar	A16 A23 A24 B2 B3 B4 B7 C3	Student work in these sessions is evaluated by correcting individual or group tokens, and student participation in debates and issues raised in the classroom. The completion of all activities related to the information research in bibliographic databases is mandatory.	30
Mixed objective/subjective test	A16 A21 A24 A25 B3 B6 C4 C5 C6 C7 C8	This exam includes multiple choice questions, short answer and essay.	40
Supervised projects	A16 A18 A21 A23 A24 A28 B2 B3 B5 C5 C6	Evaluation is carried out taking into account the following aspects: - Participation and critical thinking demonstrated by students throughout the debates raised in the classroom. - Capacity for synthesis, reasoning, etc.. reflected in the papers presented orally and / or written.	30



Assessment comments

To pass the course there are two basic requirements:

1) Regular attendance to all evaluable activities; in addition, the attendance at the Computer Classroom practices (analysis of documentary sources) is compulsory, except for students with part-time or waiver of assistance, as indicated below.

2) To achieve a minimum score of 4 (out of 10) in every evaluable activities. Such minimum score not be achieved in any one of these activities, the final grade will be Fail (4.0). To pass the subject, the overall rating may not be less than 5 (out of 10).

"Not attended" assessment mark will be applied when the conducted activities add up to less than 30% of the total score.

In the context of continuous assessment, marks obtained in seminars and supervised work can be retained for the second chance, provided they score above the minimum of 4 previously cited. The rating of the mixed test achieved in this second chance will replace that the first one.

Students evaluated in the second chance may only qualify for honors if

the maximum number of licenses for the course were not exhausted at the first opportunity.

In

the following academic courses, the teaching-learning process,

including assessment, would start which means that the students must

complete all scheduled activities for the new course.

In the case of students with part-time, or exemption from assistance, all assessed activities can be conducted online, including the practices of databases search, and ranked as if they were in attendance, so the design of a specific protocol it is not necessary.

Sources of information

Basic	<ul style="list-style-type: none"> - P. J. Bowler, I.R. Morus (2007). Panorama general de la ciencia moderna. Editorial Crítica, Madrid - Committee on Science, Engineering and Public Policy (EEUU) (1992). Responsible Science: Ensuring the Integrity of the Research Procces, vol.1.. National Academic Press, Washington - Committee on Science, Engineering and Public Policy (EEUU) (1995). On Being a Scientist. National Academy Press - David C. Lindberg. (2002). Los inicios de la ciencia occidental . Editorial Paidós, Barcelona - W.H. Brock (1998). Historia de la química, serie: Ciencia y Tecnología . Editorial Alianza Editorial, 1998, Madrid - A.F. Chalmers (1993). ¿Qué es cosa llamada ciencia?. Siglo XXI, Madrid - Patricia Fara (2009). Breve historia de la ciencia . Editorial Ariel, Barcelona <p>The following are some of the web sites we will work:- http://www.udc.es/biblioteca- http://echa.europa.eu/http://ec.europa.eu/index_es.htmThe following are some of the web sites we will work:- http://www.udc.es/biblioteca- http://echa.europa.eu/http://ec.europa.eu/index_es.htm</p>
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

- For the non english-speaking students, it is strongly recommended to have knowledge of English language, because the best part of the sources of information to be used is written in that language. - Clear and orderly writing skills are required, as well as to manage common IT tools (word processing, internet access, etc..).



(*)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.