



## IDENTIFYING DATA

### Chemistry, physics and geology: Integrated laboratory II

Subject	Chemistry, physics and geology: Integrated laboratory II			
Code	V11G200V01202			
Study programme	(*)Grao en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	Spanish			
Department				

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General description	"Machine translation into english of the original teaching guide" In this matter students will apply in a more specific way the criteria and practical skills learnt in the matter Integrated Laboratory I. Students will carry out diverse experiments that will allow them to work in more specialized laboratories. There will be a focus on the observation and preparation of a laboratory notebook as well as in the realisation of a final report of the work carried out.

## Competencies

Code	
A5	Students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy
C25	Handle chemicals safely, considering their physical and chemical properties, including the evaluation of any specific risks associated with its use
C26	Perform common laboratory procedures and use instrumentation in synthetic and analytical work
C27	Monitor, by observation and measurement of physical and chemical properties, events or changes, and document and record them in a consistent and reliable way
C28	Interpret data derived from laboratory observations and measurements in terms of their significance and relate them to the appropriate theory
C29	Demonstrate skills for numerical calculations and interpretation of experimental data, with special emphasis on precision and accuracy
D1	Communicate orally and in writing in at least one of the official languages of the University
D3	Learn independently
D4	Search and manage information from different sources
D5	Use information and communication technologies and manage basic computer tools

- D6 Use mathematics, including error analysis, estimates of orders of magnitude, correct use of units and data representations
- D7 Apply theoretical knowledge in practice
- D8 Teamwork
- D9 Work independently
- D12 Plan and manage time properly
- D13 Make decisions
- D14 Analyze and synthesize information and draw conclusions
- D15 Evaluate critically and constructively the environment and oneself

### Learning outcomes

Expected results from this subject	Training and Learning Results		
Analyse as they affect the speed of distinct reaction factors, as for example the nature of the reagents, the concentration of the same, the presence of a catalyst or the temperature.	A5	C28	D3 D7 D9 D13 D14
Distinguish a galvanic in a electrolytic cell and learn to build both types of cells.	A5	C25 C28	D1 D3 D4 D7 D8 D12 D13 D14 D15
Reproduce basic experiences in physics with the aim to show or apply some of the basic laws.	A5	C27 C28 C29	D4 D6 D7 D8 D9 D13 D14 D15
Apply the knowledge and the skills purchased the resolution of simple problems of separation, purification and characterisation of chemical compounds.	A5	C25 C26 C27 C28	D1 D3 D4 D7 D9 D12 D13 D14
Handle different *equipación *comun in the laboratory of Physics and Chemical: *polímetro, sources of feeding, oscilloscope, etc	A5	C26 C27 C29	D6 D14
Adjust the experimental conditions for a chemical process (temperature, agitation, etc.).	A5	C26 C27 C28	D3 D7 D8 D13
Handle properly the molecular models for the representation of organic and inorganic compounds	A5	C28	D1 D3 D7 D9 D12 D13 D14
Carry out the *sintesis of organic and inorganic substances simple	A5	C25 C26 C27 C28	D1 D3 D4 D9 D12 D13 D14 D15

Use programs of diffraction and interpret images of electronic microscopy differentiating the structural information (\*HREM, \*SAED) and the morphological (SEM)

A5 C28 D1  
D3  
D4  
D5  
D7  
D8  
D14

## Contents

### Topic

- Voltaic and electrolytic cells. The Nernst equation. (2 sessions)
- Separation techniques: solid- liquid extraction and thin layer chromatography. (1 session)
- Separation techniques: thin layer chromatography and column chromatography. (1 session)
- Chemical Equilibrium: Study of equilibrium of dissociation of a chemical reaction. (1,5 sessions)
- Chemical kinetics: kinetic study of a chemical reaction. (1,5 sessions)
- Equation of state of the ideal gases. (1 session)
- Representation of simple inorganic molecules: molecular models. (1 session)
- Representation of organic molecules: molecular models. (1 session)
- Synthesis of simple inorganic compounds. (2 sessions)
- Synthesis of simple organic compounds. (1 sessions)
- Synthesis of organic polymers. (1 session)
- Introduction to morphological and microstructural characterization of crystals with optical microscopy with polarised light.(2 sessions)
- Introduction to crystal growth techniques in the laboratory: crystallization from solutions ways of generation of the supersaturation. Formation of large crystals. Crystal growth in gels: the diffusion-reaction technique. (1 session)
- Determination of the specific resistance of a conductor. (1 session)
- Ohm´s law: DC circuits. (1 session)
- Calibration of a thermistor. (1 session)
- Electromagnetic induction phenomena: induced currents , Faraday and Lenz laws. Transformer. (1 session)
- Theorem of transfer of maximum power in a circuit. (1 session)

## Planning

	Class hours	Hours outside the classroom	Total hours
Laboratory practises	72	40	112
Outdoor study / field practices	8	10	18
Short answer tests	2	6	8
Practical tests, real task execution and / or simulated.	3	9	12

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

## Methodologies

	Description
Laboratory practises	They will be conducted laboratory practice sessions of 3 hours each. Students have practice scripts the supporting material in the FAITIC platform, so you may have prior knowledge of the experiments.
Outdoor study / field practices	There will be a report on the subject of field practice. Attendance is mandatory to be able to be evaluated.

## Personalized attention

Methodologies	Description
Laboratory practises	Time spent by the teacher to address all concerns and issues raised by the student along the course. The student will consult with faculty clarifications deemed appropriate in order to better understand the subject and successful develop tasks that were proposed to him/her. These queries will be handled in the titorias schedule.
Outdoor study / field practices	The student will consult with faculty clarifications deemed appropriate in order to better understand the subject and successful develop tasks that were proposed to him/her.

## Assessment

	Description	Qualification	Training and Learning Results
Laboratory practises	<p>The teacher will track the experimental work done by students in laboratory, as well as elaborate notebook sessions. Since it is experimental matter, attendance at laboratory sessions is mandatory. It is important to indicate that the non-attendance will be penalized in the final grade. If the number of absences is greater than 3, it will mean suspended matter. The days that are missing will be considered zeros in the laboratory note.</p> <p>In this section scored charged special relevance the following points:</p> <ul style="list-style-type: none"><li>-As the student in the laboratory, including its degree of autonomy developed is.</li><li>-As it solves the problems that arise when making practice.</li><li>-Which is his/her mastery of the knowledges necessary to carry out the practice.</li><li>-Cleaning and treatment of the material.</li><li>-Domain of the calculations for the internship.</li><li>-Development of laboratory notebook/reports.</li></ul>	40	A5 C25 D1 C26 D3 C27 D4 C28 D5 C29 D6 D7 D8 D9 D12 D13 D14 D15
Outdoor study / field practices	It will realise a memory on the subject of the practice of field. The assistance is compulsory to be able to be evaluated.	10	A5 C27 D1 C28 D7 D14 D15
Short answer tests	It will realise a proof written (of brief answer) relative to concrete appearances of the operations realised in the laboratory.	25	A5 C28 D1 C29 D6 D7 D14
Practical tests, and / or simulated.	It will realise a practical proof (session of laboratory) that will allow to evaluate the competitions and skills purchased by the student/the. Said proofs will be realised of independent form for each group of practices.	25	A5 C25 D1 C26 D7 C28 D9 D12 D13 D14

## Other comments on the Evaluation

To be evaluated the student has to obtain a minimum note in some of the distinct sections that comprises the evaluation, this minimum note is of 3.5 in the theoretical and practical proofs and in the outdoor study/field practices, and of 4 in the assessment of the practices of laboratory.

The assistance to more than two practical sessions will involve that the student already is being evaluated, therefore, his/her qualification will not be able to be "No Presented".

Requires a honest and responsible conduct of the students who curse this matter. Fraudulent conduct may be suspend the matter during full course.

### In the second announcement the evaluation will carry out of the following way:

A theoretical proof-practical in which they will evaluate the results of the learning of the student: 50 %.

Will conserve the punctuation reached by the student during the course; in the following sections: follow-up of the work of

laboratory (40%) and outdoor study/field practices (10%).

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### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

Atkins, P.; Jones, L., **Principios de Química**, 5ª, Panamericana, 2012

Atkins, P.; de Paula, J., **Química Física**, 8ª, Panamericana, 2008

Beckmann, W., **Crystallization: Basic Concepts and Industrial Application**, John Wiley & Sons, 2013

Chang, R.; Goldsby, K.A., **Química**, 12ª, McGraw-Hill, 2017

Martínez Grau, M.A.; Csáký, A.G., **Técnicas Experimentales en Síntesis Orgánica**, 2ª, Síntesis, 2012

Petrucci, R.; Herring, F.G.; Madura, J.D.; Bissonette, C., **Química General**, 11ª, Pearson, 2017

Shoemaker, D. P.; Garland, C.W.; Nibler, J.W., **Experiments in Physical Chemistry**, 8ª, McGraw-Hill, 2008

Tipler, P.A.; Mosca, G., **Física para la Ciencia y la Tecnología**, 6ª, Reverte, 2010

Wade, L.G., **Química Orgánica**, 7ª, Pearson Educación, 2012

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### Recommendations

#### Subjects that are recommended to be taken simultaneously

Physics: Physics II/V11G200V01201

Geology: Geology/V11G200V01205

Mathematics: Mathematics II/V11G200V01203

Chemistry: Chemistry 2/V11G200V01204

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#### Subjects that it is recommended to have taken before

Biology: Biology/V11G200V01101

Physics: Physics I/V11G200V01102

Mathematics: Mathematics I/V11G200V01104

Chemistry, physics and biology: Integrated laboratory I/V11G200V01103

Chemistry: Chemistry I/V11G200V01105

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