

# 2018/19 Undergraduate Module Guide

## Chemistry 2

**ECTS credit:** 6

**Total number of student hours:** 150

**Code:** 25151105

**Supervisor/Teaching staff:** Dr Celeste Brindley Alías

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**Taught:** Semester 2

**Year running:** 2018/19

**Co-requisites:** 25151104 Química 1 (Chemistry 1)

### MODULE DESCRIPTION

#### Objectives

On completion of this module, students will be familiar with the chemical principles relevant to any agricultural engineer and will gain an understanding of how to use thermodynamic and equilibrium data to calculate specific features of a given reaction. The relevance to specific areas of agricultural engineering will be described. Specifically, this course introduces students to aqueous equilibria, electrochemistry, coordination compounds and organic chemistry.

#### Syllabus

- Acids and Bases: concepts of strong/weak acids/bases, water and pH, acid-base reactions, buffer solutions;

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1/4



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- Solubility Equilibria: common-ion effect, predicting precipitation, selective precipitation, complex ion formation;
- Electrochemistry: redox reactions, electrode potentials, half-cells, Nernst equation, electrolysis, corrosion;
- Coordination Compounds: coordination complex formation, isomerism, electronic structure;
- Organic Chemistry: main functional groups, nomenclature, general reactions.

## Skills

On completion of the course, students should have achieved the following skills:

Transversal skills:

- UAL1: basic knowledge of the profession (to be completed with specific skills).
- UAL2: ability in the use of ICT.
- UAL3: capability for solving problems.
- UAL4: oral and written communication.
- UAL6: teamwork.
- UAL9: capability to learn to work independently.

Specific skills:

- E-CB04: basic knowledge in general chemistry, organic and inorganic chemistry and its applications in engineering.

## Private study

Reading assignments of supporting textbook  
 Review of textbook and in-class notes  
 Weekly viewing of laboratory videos for preparation of practices  
 Completion of weekly formative activities  
 Preparation for practices and seminars  
 Revision for written examinations, questionnaires, and in-class tests

## Progress monitoring

Tests on reading assignments from the study guide  
 Questionnaires  
 Teamwork problem-solving  
 Laboratory reports  
 Oral test regarding laboratory work  
 Homework and assignments

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2/4



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Partial exams and/or formal written exam

## Assignments

Recommended reading is listed below and will be described in detail during the course (study guide). Additional reading lists may be announced occasionally in class and eLearning Platform.

Homework assignments will be announced with sufficient notice. **No late homework will be accepted.**

Preparation of practices and watching the specific videos for practice preparation is **compulsory**, so students should solve any visualisation-related problems they might encounter well in advance.

## Written Exams

There will be two 2-h partial exams and one 3-h formal exam. Partial exams will be done during lecture hours. The formal exam will be done during Summer Examination period. All written exams are in English.

## Assessment (percentages may vary slightly as coursework develops)

### Coursework

Assessment type	Notes	% of formal assessment
In-class activities and other activities	Tests on reading assignments, questionnaires, team work, and homework assignments	20.00
	Seminar work, laboratory work <sup>1</sup> and laboratory reports <sup>2</sup>	20.00
Total percentage (Assessment Coursework)		40.00

### Exams

Exam type	Exam duration	% of formal assessment
Laboratory exams and attendance <sup>1</sup>	1 h	10.00
Partial/Formal exams <sup>4</sup>	2/3 h	50.00
Total percentage (Assessment Exam)		60.00

<sup>1</sup> Attendance to laboratory sessions and seminars is compulsory.

<sup>2</sup> If there is a lack of data treatment in one or more reports, students might have to do a written exam of lab data treatment as part of the formal (final) exam.

<sup>3</sup> 10 points out of 10 in the written and oral laboratory exams are requirements to pass this module

<sup>4</sup> A minimum of 5 points out of 10 in written exams is required to pass this course.

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PÁGINA

3/4



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The **final mark** for this course is calculated as the weighted average, provided that all the passing requirements are met. The **passing mark** is 5 out of 10 points.

## Bibliography

Recommended reading:

- [Chemical principles. The quest for insight](#). Peter Atkins, Loretta Jones, Leroy Laverman. W.H. Freeman & Co. 2016. 7th Edition.

Supplementary texts:

- [Analytical chemistry](#). Gary D. Christian. John Wiley & Sons. 2004.

- [Chemistry in the laboratory](#). Postma, Roberts and Hollenberg. W.H. Freeman & Co. 2000.

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