COURSE DESCRIPTION

COURSE DETAILS

Title (of the course): **COLOIDES: FUNDAMENTOS Y APLICACIONES EN ALIMENTOS**
Code: 102250
Degree/Master: **GRADO DE CIENCIA Y TECNOLOGÍA DE LOS ALIMENTOS** Year: 4
Name of the module to which it belongs: OPTATIVIDAD / RECONOCIMIENTO
Field: OPTATIVIDAD
Character: OPTATIVA
ECTS Credits: 3.0
Face-to-face classroom percentage: 40%
Online platform: Moodle
Duration:
Classroom hours: 30
Study hours: 45

LECTURER INFORMATION

Name: CANO LUNA, MANUEL
Department: QUÍMICA FÍSICA Y TERMODINÁMICA APLICADA
Area: QUÍMICA FÍSICA
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PREREQUISITES AND RECOMMENDATIONS

Prerequisites established in the study plan

None

Recommendations

None specified

INTENDED LEARNING OUTCOMES

CB4	To be able to transmit information, ideas, problems and solutions to either a specialised audience or an unspecialised one.
CB5	To develop the the skills necessary to undertake further studies with a high degree of autonomy.
CE1	To recognise and apply the basics of physics, chemistry, biology, physiology, mathematics, and statistics necessary for the comprehension and development of Science and Technology.
CE2	To know the models of food production, as well as it’s composition and physical, physical-chemical and chemical properties, to determine its nutritional value and functionality.
CT10	To have developed the motivation for quality.
CT3	Ability to work in a team.
CT4	Ability to apply theoretical knowledge to your practice.
CT8	To develop critical thinking

OBJECTIVES

-To know the basic principles of the Physical Chemistry in Colloidal Systems.
-To study the types of natural and artificial colloids.
-To evaluate the colloidal properties of natural systems in general, and in food products.
-Other objectives related to the competences of the subject, such as transmitting information, ideas, problems and

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solutions both to specialized and non-specialized publics with the topic of this subject.

CONTENT

1. Theory contents

TOPIC 1. Colloidal systems. Description. Gels, micelles, dispersions, suspensions, emulsions, foams.
TOPIC 2. Basic concepts of chemical kinetics. Kinetic versus thermodynamic control. Application in colloids and food products.
TOPIC 3. Surface and interfacial tension. Adsorption at interfaces. Function in colloids and foods.
TOPIC 4. Electrostatic stabilization of colloids. Double electric layer. Theory and examples.
TOPIC 5. Characterization of colloids. Transport phenomena. Viscosity, Diffusion, Sedimentation. Application in colloids and food products.
TOPIC 6. Vitreous transition. Methods for determination, affecting factors and examples in foods.

2. Practical contents

-Seminars of problems and for application development.
-Laboratory:
(1) Association colloids. Critical micelle concentration. Krafft temperature.
(2) Foams. Bubbles and pomps. Plateau lines.

METHODOLOGY

Methodological adaptations for part-time students and students with disabilities and special educational needs

The specific circumstances of part-time students will be studied, and through the coordination of the degree, the common criteria will be established in order to fulfil face-to-face and non face-to-face hours of the subject.

Face-to-face activities

Activity	Large group	Medium group	Total
Assessment activities	-	3	3
Group work (cooperative)	-	6	6
Lab practice	-	6	6
Lectures	15	-	15
Total hours:	***15***	***15***	***30***

Off-site activities

Activity	Total
Exercises	10
Group work	10

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Activity	Total
Self-study	25
Total hours	***45***

WORK MATERIALS FOR STUDENTS

Dossier
Exercises and activities
Placement booklet

EVALUATION

Intended learnig	Exams	Placement reports	Problem solving
CB4	X	X	X
CB5		X	
CE1	X		X
CE2	X	X	X
CT10		X	X
CT3		X	X
CT4		X	X
CT8	X	X	X
Total (100%)	***60%***	***20%***	***20%***
Minimum grade	***4***	***4***	***4***

(*)Minimum grade necessary to pass the course

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Method of assessment of attendance:

-Es necesaria la asistencia a seminarios y prácticas de laboratorio para aprobar la asignatura.
-La asistencia regular a las clases magistrales puede suponer hasta un 5% en la calificación final.
-Se controlará la asistencia mediante una hoja de firmas.
-Attendance to seminars and laboratory practices is necessary to pass the subject.
- The regular attendance to the lectures/master-classes can suppose up to 5% of the final grade.
-The attendance will be controlled by a signature sheet.

General clarifications on instruments for evaluation:

The final exams the 60% of the final grade, and it is necessary to obtain a minimum grade of 4 in each evaluation tool. If the latter requirement is not exceeded, the final grade will be suspended (less than or equal to 4).

Clarifications on the methodology for part-time students and students with disabilities and special educational needs:

The specific circumstances of each part-time student will be studied, and through the coordination of the degree, the common criteria will be established in order to evaluate to the student. However, the casuistry and the number of students will be considered.

Qualifying criteria for obtaining honors:

De acuerdo con la normativa vigente en la UCO / In accordance with the regulations of the UCO

BIBLIOGRAPHY

1. Basic Bibliography

S.C. Walwork, D.J.W. Grant (1987) Química Física para estudiantes de Farmacia y Biología, Cap. 12: Coloides. Ed. Alhambra.
P. Sanz Pedrero (1992) Fisicoquímica para farmacia y biología. Masson.Salvat.
P.C. Hiemenz, R. Rajagopalan, (1997) Principles of Colloid and Surface Chemistry, Marcel Dekker.

2. Further reading

-Colloids and Surfaces A: Physicochemical and Engineering Aspects
http://www.sciencedirect.com/science/journal/09277757/open-access
-Food Hydrocolloids
http://www.sciencedirect.com/science/journal/0268005X/open-access

COORDINATION CRITERIA

Tasks deadlines
Tasks performance

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SCHEDULE

Period	Assessment activities	Group work (cooperative)	Lab practice	Lectures
1# Week	0.0	0.0	0.0	1.0
2# Week	0.0	0.0	0.0	1.0
3# Week	0.0	2.0	0.0	1.0
4# Week	0.0	0.0	0.0	1.0
5# Week	0.0	0.0	0.0	1.0
6# Week	0.0	0.0	3.0	1.0
7# Week	0.0	0.0	3.0	1.0
8# Week	0.0	0.0	0.0	1.0
9# Week	0.0	0.0	0.0	1.0
10# Week	0.0	2.0	0.0	1.0
11# Week	0.0	0.0	0.0	1.0
12# Week	0.0	0.0	0.0	1.0
13# Week	0.0	0.0	0.0	1.0
14# Week	0.0	2.0	0.0	1.0
15# Week	3.0	0.0	0.0	1.0
Total hours:	***3.0***	***6.0***	***6.0***	***15.0***

The methodological strategies and the evaluation system contemplated in this Course Description will be adapted according to the needs presented by students with disabilities and special educational needs in the cases that are required.