UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: PHYSICS
Type: BASIC
Degree: 398 - UNDERGRADUATE DEGREE PROGRAMME IN CHEMISTRY
Center: 1 - FACULTY OF SCIENCE AND CHEMICAL TECHNOLOGY
Year: 1
Main language: Spanish
Use of additional languages:
Web site:

Code: 57302
ECTS credits: 12
Academic year: 2020-21
Group(s): 20 23
Duration: AN
Second language:
English Friendly: Y
Bilingual: N

Lecturer: **MIGUEL ANGEL ARRANZ MONGE** - Group(s): **20 23**

Building/Office	Department	Phone number	Email	Office hours
Fac. CC y Tecnologías Químicas	FÍSICA APLICADA	926052663	miguelangel.arranz@uclm.es	Tuesday and Thursday from 17:00 to 20:00

Lecturer: **RICARDO LOPEZ ANTON** - Group(s): **20 23**

Building/Office	Department	Phone number	Email	Office hours
Fac. CC y Tecnologías Químicas	FÍSICA APLICADA	926052782	ricardo.lopez@uclm.es	Monday to Thursday (afternoon), upon email request

2. Pre-Requisites

Not established

3. Justification in the curriculum, relation to other subjects and to the profession

Not established

4. Degree competences achieved in this course

Course competences

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
E17	Develop the ability to relate to each other the different specialties of Chemistry, as well as this one with other disciplines (interdisciplinary character)
G01	Know the principles and theories of Chemistry, as well as the methodologies and applications characteristic of analytical chemistry, physical chemistry, inorganic chemistry and organic chemistry, understanding the physical and mathematical bases that require
T02	Domain of Information and Communication Technologies (ICT)
T08	Skills in interpersonal relationships
T11	Ability to obtain bibliographic information, including Internet resources

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Learn to search for and select information in the field of Physics, to process it and present it properly, both orally and in writing, developing its capacity for synthesis, being critical and objective.

Learn to solve complex problems that require to relate different branches of the studied physics and interpret the results obtained.

Learn to use data analysis software to prepare professional presentations of your experimental results

Develop abstract reasoning

Have the basic physical quantities necessary to face the most advanced chemistry concepts that will appear throughout the degree, being able to establish relationships between the different concepts

Master the basic scientific terminology as well as the management of units and their conversions.

In general and in a transversal way, all those values ¿¿and attitudes inherent to scientific activity will be raised and promoted in the student.

Familiarization with laboratory work: learn to take experimental measures by controlling the sources of error, quantify their scope and correctly express the result of a measurement accompanying error and units.

Homogenize the physics knowledge of the class, while providing them with the minimum physics base that every scientist should have

6. Units / Contents

Unit 1: Introduction to Physical Sciences

Unit 2: Point Kinematics

Unit 3: Dynamics of a particle

Unit 4: Dynamics of a particle system

- **Unit 4.1** Newton's Laws. Conservation theorems
- **Unit 4.2** The rigid solid
- **Unit 4.3** Fluids

Unit 5: Elastic interaction

Unit 5.1 Simple harmonic motion
Unit 5.2 Mechanical waves
Unit 6: Electric field
Unit 6.1 Electric field in a vacuum
Unit 6.2 Electric field in matter
Unit 7: Electric current
Unit 8: Magnetic field
Unit 8.1 Static magnetic field
Unit 8.2 Time-dependent electromagnetic fields
Unit 9: Introduction to electromagnetic waves and Optics
Unit 9.1 Maxwell's equations and electromagnetic waves
Unit 9.2 Introduction to Optics
Unit 10: Introduction to the Physics laboratory
Unit 10.1 Measurement theory and analysis
Unit 10.2 Experiments on Mechanics
Unit 10.3 Experiments on Electromagnetism

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	CB01 E17 G01	3.36	84	N	-	Teaching of theoretical classes corresponding to the syllabus of the subject. Solving practical exercises by both the teacher and the students.
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB01 E17 G01 T02 T08	0.8	20	Y	Y	Practical classroom teaching (laboratory)
Progress test [ON-SITE]	Assessment tests	CB01 E17 G01 T02 T08 T11	0.3	7.5	Y	Y	Written exams
Other off-site activity [OFF-SITE]	Self-study	CB01 E17 G01 T02 T11	5.7	142.5	N	-	Documentation, preparation, learning and resolution of practical cases
Study and Exam Preparation [OFF-SITE]	Self-study	CB01 E17 G01	1.84	46	N	-	Preparation and accomplishment of examinations
		Total:	**12**	**300**			
		Total credits of in-class work: 4.46					**Total class time hours: 111.5**
		Total credits of out of class work: 7.54					**Total hours of out of class work: 188.5**

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Progress Tests	80.00%	0.00%	The periodic exams distributed in the calendar will consist of a theoretical part (contents exposed in the master classes) and a practical part (resolution of exercises). The evaluation of the student's knowledge through these exams is automatically equivalent (and substitutes) to the ordinary call or final test.
Final test	0.00%	100.00%	The final test is an alternative to progress tests
Laboratory sessions	20.00%	0.00%	Its completion is mandatory and the student must succeed in this part in order to succeed in the subject. The student must carry out at least one Mechanics and one Electromagnetism experience, write the respective reports and, later, publicly expose or defend the conclusions of above works.
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

The course is divided into two semesters: Mechanics and Electromagnetism.
To be evaluated in the ordinary call, the student must select one of the following itineraries:
1) Evaluation through progress tests (see above). Each semester includes practical and theoretical controls, their grade being the weighted average of these exercises (each teacher will detail this weight on the first day of class). Subsequently, the final grade for the course will be the average of each semester as long as grades equal to or greater than four have been obtained in both parts. The course will be considered approved when the final grade is equal to or greater than five,
2) Evaluation through the final exam. For students who do not wish to take the progress tests, a final exam is proposed that will consist of two blocks (relating to the four-month period of the course), each with theoretical and practical questions. In the same way, the final mark of the exam will be the average of each block as long as grades equal to or greater than four have been obtained in both parts. The course will be considered approved when the final grade is equal to or greater than five.
Regardless of the chosen itinerary, only once the ordinary call has been approved will the laboratory practice grade be taken into account to calculate the final grade in the certificate. In any case, the student must succeed also in the laboratory sessions in order to be able to successfully pass the subject.

Non-continuous evaluation:

On the official date of the ordinary call, the student must take an exam (called final test) divided into two parts, as many as semesters. In each of them, you must answer two practical exercises and various theoretical questions according to the subject's syllabus. The final grade of the final test will be the average of both parts, provided that both equals or exceeds four. If that qualification is equal or higher than five, the student must additionally take a theoretical-practical laboratory exam on the same day as the exam. Once this laboratory test has been passed, 100% of the grade in your ceritificate will correspond to the final test.

Specifications for the resit/retake exam:

The extraordinary exam will be of the same type as the final exam of the ordinary call (Mechanics and Electromagnetism, with theoretical and practical questions).
Students who have not succeeded in the ordinary call must appear in addition to this final exam (extraordinary call). As considered, the student can sit the full exam, or only to the part of the semester where the previous grade was less than four.
The rest of the evaluation criteria are identical to those of the ordinary call.

Specifications for the second resit / retake exam:

The design of the written test and its evaluation criteria are the same as in the ordinary call (non-continuous option).

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	**hours**

Unit 1 (de 10): Introduction to Physical Sciences

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 2 (de 10): Point Kinematics

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 3 (de 10): Dynamics of a particle

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 4 (de 10): Dynamics of a particle system

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 5 (de 10): Elastic interaction

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 6 (de 10): Electric field

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 7 (de 10): Electric current

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 8 (de 10): Magnetic field

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 9 (de 10): Introduction to electromagnetic waves and Optics

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Unit 10 (de 10): Introduction to the Physics laboratory

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	9
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	20
Progress test [PRESENCIAL][Assessment tests]	7.5
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6

Global activity

Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	84
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	20
Progress test [PRESENCIAL][Assessment tests]	7.5
Other off-site activity [AUTÓNOMA][Self-study]	142.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	46
Total horas:	300

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Alonso, M y Finn, Edward J.	Física (Tomos I y II)	Addison-Wesley		0-201-62565-2	2007	
Burbano de Ercilla, Santiago	Problemas de física	Tébar		978-84-95447-27-2	2007	
González, F.A.	Problemas de fisica	Tébar Flores		84-7360-026-6	1994	
Olga Alcaraz I Sendra; José López López; Vicente López Solanas	Física: problemas y ejercicios resueltos	Pearson		8420544477	2005	
Sears, Francis W.	Física universitaria	Addison-Wesley Iberoamericana		978-607-33-2124-5	2013	
Serway, Raymond A.	Física: para ciencias e ingenierías	Thomson		970-686-423-7	2005	
Tipler, Paul Allen	Física para la ciencia y la tecnología	Reverté		978-84-291-4428-4	2012	
Hugh Young, Roger Freedman, Francis Sears, Mark Zemansky	University Physics	Pearson		978-8131758625	2016	
R. Serway	Physics for scientists and engineers (10th ed.)	NATIONAL GEOGRAPHIC LEARNING		9781337553278	2017	
Paul A. Tipler	Physics for scientists and engineers (6th ed.)	W.H. FREEMAN & COMPANY		9781429202657		