UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: PHYSICS
Type: BASIC
Degree: 409 - 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: 2023-24
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	Monday 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	Please, contact the teacher by email

Lecturer: **JOSÉ CARLOS MENA ARROYO** - Group(s): **20 23**

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2. Pre-Requisites

It is advised to have a solid background in Physics equivalent to the adquired in the Scientific-Technological high school: Physical magnitudes and Units, Kinematics, Dinamics and Electromagnetism. It is also convenient to know some concepts of Mathematical Analysis: derivatives, integrals and so on.

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

This subject develops the contents of Physical Sciences in the basic formation module of the Chemistry Degree. It is closely related to other fundamental sciences as Mathematics and Chemistry and it provides background for othe subjects of higher courses as Materials Science and Chemistry Physics. In order to know more about its relationship with other subjects of the degree and to the profesional activity, the memory of the Chemistry degree of the UCLM should be consulted.

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)
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
Progress test [ON-SITE]	Assessment tests	CB01 E17 G01 T02 T08 T11	0.3	7.5	Y	Y	
		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%	Each mid-term exam (one per term) is divided in five exams distributed along the semester. These periodic exams 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 to the ordinary call or final test(and substitutes it).
Final test	0.00%	80.00%	The final test is an alternative to mid-term exams
Laboratory sessions	20.00%	20.00%	Except for official cause and duly justified by the student, their 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 subject consists of two semesters, Mechanics and Electromagnetism, and a experimental part (laboratory).
Each semester includes practical and theoretical controls, being your grade the weighted average of these exercises, as the teacher will detail in class.
Subsequently, the overall grade will be the average of each semester, provided that in both parts grades equal to or greater than four have been obtained.
These semesters (80% of the subject) will be considered approved globally when the average grade is equal to or greater than five. Only then, the grade of the laboratory part (20% of the subject) will be taken into account to calculate the complete and definitive grade of the subject.

Non-continuous evaluation:

For students who do not wish to take the progress tests, a final exam is proposed, consisting of two blocks (related to the semesters of the course), each of them with theoretical questions and two practical exercises. As in the continuous evaluation, the final grade of the exam will be the average of each block, provided that in both parts grades equal to or greater than four have been obtained. The subject will be considered approved when the final grade is equal to or greater than five. If this final grade is greater than or equal to five, the subject will be considered passed by 80% and only then the grade of laboratory part is added (remaining 20%). If the student has not previously carried out that experimental part (only for officially justified cause), he must then take a theoretical-practical laboratory exam. Once this laboratory test has been passed, your grade would correspond to the remaining 20%.

Specifications for the resit/retake exam:

The extraordinary exam (call) will be of the same type as the final exam of the ordinary call (Mechanics and Electromagnetism, with theoretical and practical issues). Students who have not passed the ordinary call must additionally take this final exam (extraordinary call), which is divided into two parts corresponding to the respective semesters. In this written test, the student must answer the theoretical and practical questions of the failed semester or semesters (with grades less than four), and optionally, keep the notes of those parts with grades equal to or greater than the four obtained in the ordinary call.
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**
Progress test [PRESENCIAL][Assessment tests]	7.5
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
Other off-site activity [AUTÓNOMA][Self-study]	14.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.6
Global activity	
Activities	**hours**
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	20
Class Attendance (theory) [PRESENCIAL][Lectures]	84
Other off-site activity [AUTÓNOMA][Self-study]	142.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	46
Progress test [PRESENCIAL][Assessment tests]	7.5
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		