



1. General information

Course: MEASUREMENT AND CONTROL OF ATMOSPHERIC POLLUTION
Type: ELECTIVE
Degree: 2326 - MASTER DEGREE PROGRAMME IN CHEMICAL RESEARCH
Center: 1 - FACULTY OF SCIENCE AND CHEMICAL TECHNOLOGY
Year: 1

Main language: Spanish

Use of additional languages:

Web site:

Code: 310588

ECTS credits: 6

Academic year: 2019-20

Group(s): 20

Duration: C2

Second language: English

English Friendly: Y

Bilingual: N

Lecturer: JOSE ALBALADEJO PEREZ - Group(s): 20

| Building/Office | Department | Phone number | Email | Office hours |
|---------------------------------|----------------|--------------|-------------------------|--|
| EDIFICIO MARIE CURIE, 2ª PLANTA | QUÍMICA FÍSICA | 3451 | jose.albaladejo@uclm.es | Martes y Jueves: 12:30-14:00 17:00-18:30 |

Lecturer: BEATRIZ CABAÑAS GALAN - Group(s): 20

| Building/Office | Department | Phone number | Email | Office hours |
|------------------------------------|----------------|--------------|-------------------------|------------------------------|
| Edificio Marie Curie (primer piso) | QUÍMICA FÍSICA | 926052042 | beatriz.cabanas@uclm.es | Lunes y martes 16:30 a 18:30 |

Lecturer: MARIA SAGRARIO SALGADO MUÑOZ - Group(s): 20

| Building/Office | Department | Phone number | Email | Office hours |
|----------------------|----------------|--------------|--------------------------|---|
| EDIFICIO MARIE CURIE | QUÍMICA FÍSICA | 3450 | sagrario.salgado@uclm.es | Monday from 9:30 a.m. to 12:30 a.m. and 4:00 p.m. Tuesday from 10:30 to 12:30 |

Lecturer: FLORENTINA VILLANUEVA GARCÍA - Group(s): 20

| Building/Office | Department | Phone number | Email | Office hours |
|-----------------|----------------|--------------|----------------------------|--------------|
| | QUÍMICA FÍSICA | | Florentina.VGarcia@uclm.es | |

2. Pre-Requisites

Not established

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

The current concern for the environment and the necessary consideration that any activity causes alterations in it, is being translated into an inclusion of subjects of environmental themes in the curricula of University degrees and Masters, especially in science. The study of environmental problems caused by human activity has a multidisciplinary nature given the interrelation between the phenomena of air pollution, water, and those derived from the improper management of waste. The purpose of this subject is to focus on the problem of air pollution and get the student to acquire a correct idea of why air pollution problems, the factors that influence them, the way to quantify them, the way to minimize them and the consequences that will result when opting for certain solutions. Although in the degree of Chemistry of this university there is an optional subject Chemistry and Atmospheric Pollution, in this Master subject, although an introduction to Atmospheric Chemistry and pollution is made, the knowledge is expanded in the following points: study of the dispersion of pollutants, sampling and analysis methods, other detection techniques, environmental regulations and processes to minimize pollution. Therefore, the training acquired by the student will enable him to develop professional activities in environmental quality laboratories or pollution control.

4. Degree competences achieved in this course

Course competences

| Code | Description |
|------|--|
| E09 | Knowing the possibilities offered by new analytical methodologies in different fields of application, such as environmental analysis, pharmacological analysis, etc. |
| E12 | Being able to plan and develop projects and experiments, as well as linking different scientific specialties (interdisciplinary character). |
| E13 | Knowing the methods to measure and control air pollution at different levels, and being able to design new methods to avoid the problems it causes. |
| G01 | Knowing the precision of the experimental data and its use for the planning of experimental research work. |
| G02 | Having the necessary ability to perform advanced laboratory procedures and the use of instrumentation in synthetic and analytical work. |
| T02 | Ability to work in a team and to exercise leadership functions, fostering the entrepreneurial character |
| T03 | Motivation for quality, job security and awareness of environmental issues, with knowledge of internationally recognized systems for the correct management of these aspects |
| T05 | Ability to obtain bibliographic information at the research level, including Internet resources (databases, specialized scientific bibliography, social networks, etc ...), as well as carry out a selection and classification of it. |
| T06 | Being able to develop professionally through continuous training. |

5. Objectives or Learning Outcomes

Course learning outcomes

Not established.

Additional outcomes

6. Units / Contents

Unit 1:
Unit 2:
Unit 3:
Unit 4:
Unit 5:
Unit 6:
Unit 7:
Unit 8:

7. Activities, Units/Modules and Methodology

| Training Activity | Methodology | Related Competences (only degrees before RD 822/2021) | ECTS | Hours | As | Com | R | Description |
|---|------------------------|---|--|------------|---|-----|---|-------------|
| Class Attendance (theory) [ON-SITE] | Lectures | E09 E13 G01 T03 T06 | 0.88 | 22 | Y | N | Y | |
| Workshops or seminars [ON-SITE] | Workshops and Seminars | E12 T05 T06 | 0.56 | 14 | Y | N | Y | |
| Laboratory practice or sessions [ON-SITE] | Group Work | E12 G02 T02 T06 | 0.8 | 20 | Y | Y | Y | |
| Study and Exam Preparation [OFF-SITE] | Self-study | E09 E12 E13 G01 G02 T03 T05 | 1.76 | 44 | Y | N | Y | |
| Study and Exam Preparation [OFF-SITE] | Self-study | E09 E12 E13 G01 G02 T03 T05 | 0.56 | 14 | Y | N | Y | |
| Progress test [ON-SITE] | Assessment tests | E09 E12 E13 G01 G02 T03 | 0.16 | 4 | Y | N | Y | |
| Study and Exam Preparation [OFF-SITE] | Assessment tests | E09 E12 E13 G01 G02 T05 | 0.88 | 22 | Y | N | Y | |
| Practicum and practical activities report writing or preparation [OFF-SITE] | Group Work | E09 E12 E13 T02 | 0.4 | 10 | Y | N | Y | |
| Total: | | | 6 | 150 | | | | |
| | | | Total credits of in-class work: 2.4 | | Total class time hours: 60 | | | |
| | | | Total credits of out of class work: 3.6 | | Total hours of out of class work: 90 | | | |

As: Assessable training activity

Com: Training activity of compulsory overcoming

R: Rescheduling training activity

8. Evaluation criteria and Grading System

| Evaluation System | Grading System | | Description |
|---|----------------|--------------------|-------------|
| | Face-to-Face | Self-Study Student | |
| Projects | 30.00% | 0.00% | |
| Final test | 20.00% | 0.00% | |
| Laboratory sessions | 20.00% | 0.00% | |
| Assessment of problem solving and/or case studies | 30.00% | 0.00% | |
| Total: | 100.00% | 0.00% | |

9. Assignments, course calendar and important dates

| Not related to the syllabus/contents | |
|--|--------------|
| Hours | hours |
| Unit 1 (de 8): | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 3 |
| Workshops or seminars [PRESENCIAL][Workshops and Seminars] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 6 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 2 |
| Unit 2 (de 8): | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 3 |
| Workshops or seminars [PRESENCIAL][Workshops and Seminars] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 6 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 2 |
| Unit 3 (de 8): | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 3 |
| Workshops or seminars [PRESENCIAL][Workshops and Seminars] | 2 |

| | |
|---|--------------|
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 6 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 2 |
| Unit 4 (de 8): | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 3 |
| Workshops or seminars [PRESENCIAL][Workshops and Seminars] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 6 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 2 |
| Progress test [PRESENCIAL][Assessment tests] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Assessment tests] | 11 |
| Unit 5 (de 8): | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 4 |
| Workshops or seminars [PRESENCIAL][Workshops and Seminars] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 8 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 2 |
| Unit 6 (de 8): | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 3 |
| Workshops or seminars [PRESENCIAL][Workshops and Seminars] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 6 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 2 |
| Unit 7 (de 8): | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 3 |
| Workshops or seminars [PRESENCIAL][Workshops and Seminars] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 6 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 2 |
| Progress test [PRESENCIAL][Assessment tests] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Assessment tests] | 11 |
| Unit 8 (de 8): | |
| Activities | Hours |
| Laboratory practice or sessions [PRESENCIAL][Group Work] | 20 |
| Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work] | 10 |
| Global activity | |
| Activities | hours |
| Workshops or seminars [PRESENCIAL][Workshops and Seminars] | 14 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 14 |
| Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work] | 10 |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 22 |
| Laboratory practice or sessions [PRESENCIAL][Group Work] | 20 |
| Study and Exam Preparation [AUTÓNOMA][Assessment tests] | 22 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 44 |
| Progress test [PRESENCIAL][Assessment tests] | 4 |
| Total horas: 150 | |

| 10. Bibliography and Sources | | | | | | |
|------------------------------|--|------------------|------|------|------|-------------|
| Author(s) | Title/Link | Publishing house | Citv | ISBN | Year | Description |
| Campbell J. | Introduction to remote sensing | Guildford | | | 2007 | |
| Charles Elachi | INTRODUCTION TO THE PHYSICS AND TECHNIQUES OF REMOTE SENSING | Jakob Van Zyl, | | | 2006 | |
| Orozco, C y col | Contaminación ambiental, una visión desde la química | Thomson | | | 2008 | |
| Mariano Seoanez Calvo | TRATADO DE LA CONTAMINACIÓN ATMOSFÉRICA | MundiPrensa | | | 2002 | |
| http://www.radiello.com | R&P-CO. (2001). RADIELLO® | | | | | |