

UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

C	ourse: ENVIRO	NMENTAL POLLUTION		Code: 37324								
	Type: CORE C	OURSE		ECTS credits: 6								
D	egree: 340 - UN	IDERGRADUATE DEGREE PROGRA	MME IN ENVIR	Academic year: 2021-22								
(Center: 501 - FA	CULTY OF ENVIRONMENTAL SCIEN	CES AND BIOC	Group(s): 40								
Year: 3							Duration: C2					
Main language: Spanish							Second language:					
Use of additional languages:							English Friendly: Y					
We	b site:						Bil	ingual: N				
Lecturer: MARIA JIMENEZ MORENO - Group(s): 40												
Building/Office	Department		Phone number	E	mail		Office hours					
Sabatini/0.8	Q. ANALÍTICA Y TGIA. ALIMENTOS 926051710			m	maria.jimenez@uclm.es Tuesday, Wednesday and Thurse			lay from 12 to 14 h. Arrange an appointment by e-mail.				
Lecturer: ANA MARIA ROI	RIGUEZ CER	/ANTES - Group(s): 40					· ·					
Building/Office Department				Phone number Email			Office hours					
Sabatini, despacho 0.222 QUÍMICA FÍSICA				5494	anamai	ria.rodriguez@uclm.es	Arrange an appointment by e-mail.					
Lecturer: DIANA RODRIGUEZ RODRIGUEZ - Group(s): 40												
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Lecturer: ARMANDO SÁNCHEZ CACHERO - Group(s): 40												
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ICAM/Laboratorio 0.22 Q. ANALÍTICA Y TGIA. ALIMENTOS						Armando.Sanchez@u						

2. Pre-Requisites Not established

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

Nowadays, pollution is one of the most serious problems affecting both environmental compartments and humans. Thus, this subject presents a brief introduction of the scientific basis of air, water and soil pollution and the practical approachesthat can be apply for it

4. Degree competences acm	
Course competences	
Code	Description
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
CB06	Students have developed the ability to work as a team and lead, direct, plan and supervise multidisciplinary teams
E04	Ability to integrate experimental evidence found in field and/or laboratory studies with theoretical knowledge.
E05	Capacity for qualitative data interpretation
E06	Capacity for quantitative data interpretation
E13	Ability to handle software.
E25	Capacity to treat contaminated soil.
E26	Ability to assess air quality and purify air emissions
G01	Proficiency in a second foreign language at level B1 of the Common European Framework of Reference for Languages.
G03	Good oral and written communication

5. Objectives or Learning Outco Course learning outcomes

Description

That the student knows and understands the main types of chemical balances and their implications in natural and/or industrial processes of both pollution and decontamination

The student will be able to apply his or her knowledge to extract relevant information on the chemical nature of both the components of the natural environment and the pollutants, their reactivity in the environmental systems (atmosphere, soil, water and interfaces) and their toxicity or dangerousness as well as to evaluate different possibilities for their control, prevention, mitigation and remediation of pollution.

That the student is able to leave and treat environmental and/or industrial samples for their control and analysis using the most appropriate analytical techniques in each case.

Additional outcomes
That the student will be able to evaluate and predict the dispersion of air pollutants in different situations regarding the source of emission and taking into account the local climate conditions.
That the student knows and identifies the main natural and anthropogenic air, soil and water pollutants and understands their dynamics and transformations in the environmental compartments.

6. Units / Contents

Unit 1: Introduction to environmental pollution. Unit 2: Atmospheric circulation, transport, diffusion and dispersion of pollutants.

Unit 3: Air quality in Castilla-La Mancha.

Unit 4: Air pollution control strategies. Unit 5: Water pollution: sources, transport, dispersion and effects of pollutants. Control and assessment.

Unit 6: Soli pollution: sources, transport, dispersion and effects of pollutants. Control and assessment. Unit 7: Water and soil quality. Regulatory framework. ADDITIONAL COMMENTS, REMARKS

Laboratory sessions:

A Simulation Program for Modelling Atmospheric Pollutant Dispersion. Detection of Air Pollutants by Fourier Transform Infrared Spectrometry. Catalytic Converter Efficiency in Cars.

Catalytic converse Europhysics and the second secon

7. Activities, Units/Modules and Methodology										
Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Corr	Description			
Class Attendance (theory) [ON-SITE]	Lectures	E25 E26 G01	1	25	5 1	4	Teaching classes will be developed in an interactive way with the students including open discussion. The presentations to follow the classes will be available at the Moodle virtual platform for download.			
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CB02 E04 E05 E06	0.5	12.5	5 1	4 .	These sessions pretend to improve the comprehension of the studied topics through the execution of exercises and cases studies.			
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	CB02 CB06 E04 E05 E06 E13 E25 E26 G03	0.62	15.5	i I	()	Practical sessions will be compulsory and will be organized in working groups. These practical sessions will enable the students to apply the theoretical concepts to real situations. These lab sessions will not be recoverable, but the evaluation of this activity could be recover in the different calls.			
Other on-site activities [ON-SITE]	Assessment tests	CB02 E04 E05 E06 E25 E26 G03	0.04		١	()	A written evaluation test about laboratory sessions will be performed.			
Final test [ON-SITE]	Assessment tests	CB02 E05 E06 E25 E26 G03	0.12		3 1	()	A final written test including two different exams (theory and problems solving) will be performed. This final test will evaluate both theoretical contents and problem solving ability.			
Study and Exam Preparation [OFF-SITE]	Self-study	CB02 E04 E05 E06 G01	3.6	90) N	1	-			
Other on-site activities [ON-SITE]	Other Methodologies	CB02 E05	0.1	2.5	5 1	r n	Questions of concern related to the proposed topics will be discussed at classes with Turning Point.			
Other on-site activities [ON-SITE]	Assessment tests	CB02 E05	0.02	0.5	5 1	()	An initial written evaluation test will be performed before the lab sessions. This activity will be compulsory and unrecoverable.			
Total:										
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					

sessable training activity As: As

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				
Other methods of assessment	20.00%	0.00%	Participation in different activities that will be proposed during the course. These activities are not compulsory nor recoverable.				
Laboratory sessions	10.00%	10.00%	An initial written exam will be performed before the lab sessions in order to assess the comprehension about the lab guidelines. This activity will be compulsory and unrecoverable.				
Test	10.00%	10.00%	A written exam about laboratory sessions will be performed. A minimum grade of 4.0 points out of 10 will be required to make average with the qualifications obtained in the rest of activities.				
Final test	30.00%	40.00%	A final exam of theoretical concepts which include questions about the entire subject (air, water and so pollution) will be performed. A minimum of 4.0 points out to 10 will be required to be able to sum the rest of the activities.				
Final test	30.00%	40.00%	A final exam of problems/exercises related to all types of pollution will be performed. A minimum of 4.0 points out to 10 will be required to be able to sum the rest of the activities.				
Total:	100.00%	100.00%					
According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who car an ordinary and an extraordinary one (evaluating 100% of the competences).	nnot regularly attend face-t	p-face training activities th	e passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject,				

Evaluation criteria for the final exam:

Continuous assessment:

In order to pass the subject, it will be compulsory to have completed and passed the lab work. For that purpose, attendance to all laboratory sessions will be compulsory. In addition, the evaluation test of the laboratory sessions must also be passed. Lab work mark will be kept the next academic year if the subject is not passed. The final exam will consist of some questions about the theoretical contents and numerical cases studies. A minimum of 4 points out of 10 in both parts will be necessary to average the mark of this exam with the marks obtained in the rest of activities. In any case, the subject will be passed if the global mark of the overall assessable activities are 5 or higher over 10.

Non-continuous evaluation:

In order to pass the subject, it will be compulsory to have completed and passed the lab work. For that purpose, attendance to all laboratory sessions will be compulsory. In addition, the evaluation test of the laboratory sessions must also be passed. Lab

work mark will be kept the next academic year if the subject is not passed in the based in the intervence of an about the theoretical contents and numerical cases studies. A minimum of 4 points out of 10 in both parts will be necessary to average the mark of this exam with the marks obtained in the rest of activities. In any case, the subject will be passed if the global mark of the overall assessable activities are 5 or higher over 10.

Specifications for the resit/retake exam:

The resit/retake exam will consist of some questions about the topics of the subject and the lab work (if it has not been previously passed). In this resit/retake exam, a minimum of 4 points out to 10 must be required to sum the marks obtained in the rest of activities. In any case, the subject will be passed if the global mark of the overall assessable activities are 5 or higher over 10.

Specifications for the second resit / retake exam:

The special retake exam will consist of some questions about the topics of the subject and the lab work (if I has not been previously passed). In the special retake exam, a minimum of 4 points out to 10 must be required in both theory and lab exams to pass the subject.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	16
Other on-site activities [PRESENCIAL][Assessment tests]	1
Final test [PRESENCIAL][Assessment tests]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Other on-site activities [PRESENCIAL][Other Methodologies]	1
Other on-site activities [PRESENCIAL][Assessment tests]	.5
Unit 1 (de 7): Introduction to environmental pollution.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Unit 2 (de 7): Atmospheric circulation, transport, diffusion and dispersion of pollutants.	
Activities	Hours
Class Attendance (theory) IPRESENCIALI[Lectures]	1.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Other on-site activities [PRESENCIAL][Other Methodologies]	.5
Unit 3 (de 7): Air quality in Castilla-La Mancha.	
Activities	Hours
Class Attendance (theory) IPRESENCIAI III ectures]	2
Other on-site activities IPRESENCIAI liCither Methodologies	1
Linit 4 (de 7): Air rollution control strategies	·
	Hours
Class Atandanse (theon) IRRESENCIAI II estures	7
Problem solving and/or pre-barrows_precisionary	3
Other on-site activities (PBESENCIA) (Other Methodologies)	1
Diff 5 (dd 2): Water politicity: environment denormal interaction and affacts of politizatis. Control and assessment	•
onit of the reliable point on sources, nansportaispersion and energies of point and assessment.	Hours
	5.5
Vides Automatic (interity) (FIGSERVINE] (Educates)	3.5
To be no solving and to case studies (The Control Action solving and exercises)	1
United data accesses in the Elevent Elevent methodologies	•
Unit o (ue 7): Son policition: sources, transport, dispersion and enects of policiants. Control and assessment.	Heure
Activities	nours
Vides Autoritation (info) (PEDSENVIAL]Lectures)	5.5
Provini soving anoni case succes (Proceducine) and exercises	2
	1
Unit / (de /): water and soil quality. Hegulatory tramework.	Using
	Hours
Viass Autoritation (Interview) (Procession Autoritation and	1.5 F
	.5
	h
Activities Dicklem sching and/or sees studies (DECENCIA) (Disklem sching and susrises)	hours
Provenin solving anouncase subures [Processive Act] Provening and exercises]	9.5
Vides Autoritative (intervity) (PriceServolac) Lectures)	20
Lauriaury practice or sessions (r n. 50-roma) r factical or factoronia (r factoronia dal vintes)	1
	2
	2
United outside aduitings (r https://one.jpunetimeal/doulogies)	0.5
United united additional of Inclustrational provided in the state of t	0.5
	Lborge: 150

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Domènech, Xavier	Química ambiental de sistemas terrestres	Reverté		84-291-7906-2	2006	
Manahan, Stanley E.	Introducción a la química ambiental	Universidad Nacional Autónoma de México Reve	r	968-6708-60-X	2007	
Marín García, María Luisa	Análisis químico de suelos y aguas: manual de laboratorio	Universidad Politécnica. Departamento de Química,		84-9705-242-0	2002	
Marín García, María Luisa	Análisis químico de suelos y aguas: transparencias y problemas	Universidad Politécnica de Valencia. Servicio de P		978-84-9705-448-5	2003	
Mirsal, Ibrahim A.	Soil pollution: origin, monitoring & remediation	Springer		978-3-540-70775-2	2008	
Orozco Barrenetxea, Carmen y otros	Contaminación ambiental: una visión desde la química	Thomson		978-84-9732-178-5	2008	
Cruz-Guzmán Alcalá, Marta	La contaminación de suelos y aguas: su prevención con nuevas sustancias naturales	Universidad de Sevilla, Secretariado de Publica		978-84-472-0926-2	2007	
Orozco Barrenetxea, Carmen y otros	Problemas resueltos de contaminación ambiental	Thomson editores		84-9732-188-X	2003	
Vallero, Daniel A.	Environmental contaminants: assessment and control	Academic Press		0-12-710057-1	2004	
Vicent Espert y P. Amparo López	Dispersión de contaminantes en el aire	UNIVERSIDAD POLITECNICA DE VALENCIA. SERVICIO DE PUBLICACION		9788477219149	2000	
Wark Warner	Contaminación del aire. Origen y control	Limusa		968-18-1954-3		
	Manual de contaminación ambiental	Fundación Mapfre		84-7100-801-7	2000	
						Portal de información ambiental

http://pagina.jccm.es/medioambiente/rvca/calidadaire.htm

http://www.ipcc.ch/

Grupo intergubernamental de expertos sobre el cambio climático