

25237 - Waste application on soil and fertility

Información del Plan Docente

Academic Year	2016/17
Academic center	201 - Escuela Politécnica Superior
Degree	277 - Degree in Environmental Sciences
ECTS	6.0
Course	
Period	Four-month period
Subject Type	Optional
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

The teaching activities can be broken down into the following categories:

- Lectures: cover the basics of a subject and act as a starting point. Each lecture typically lasts around 50 minutes
- Practicals: Practical laboratory work (two hours a week) and technical visits (6 hours in two visits) are an integral part of teaching
- Tutorials: one hour a week, plus preparation time

5.2. Learning activities

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The learning process for this subject is based on the following:

Theoretical sessions

Laboratory sessions

Field-Practical sessions and technical visits

Seminar sessions

Tutorial sessions

Individual work and Independent learning

Assessment tasks: Includes tests of theoretical concepts and oral presentation of practical results

5.3.Program

1. SOIL FERTILITY AND GENERAL ASPECTS

1. Introduction: The problems with the creation of subproducts of human activity.
2. The planning of applying sewage to soil. Limitations, advantages and adverse effects.
3. Soil quality. Concepts, definitions and management.
4. Soil fertility. M.O. and mineral nutrients.

2 SPECIFIC CYCLES, INTERESTS AND WASTE CONSIDERATIONS

1. Generation of and destination of waste. General aspects and definitions.
2. Cycle of secondary nutrients elements Ca, Mg, Na and K. The importance of soil. Needs and effects for the plants.
3. Ciclo de los microelementos. Importancia en el suelo. Necesidad y efectos para las plantas. Microelement cycles. Importance of soil. Needs and effects for the plants
4. Heavy metals in soil. Origin and accumulation. Effects on plants.
5. The management of waste destined for agriculture. Gestión de residuos con destino a la agricultura. Applicable regulations.
6. Interests and restrictions on the use of residual wastes from industrial activity or extractive. Main characteristics. Agricultural interests. Interests and restrictions.
7. Interests and restrictions on the use of residual wastes from urban and leisure activities. Main characteristics. Agricultural interests.
8. Interests and restrictions on the use of residual wastes from animal husbandry. Main characteristics. Agricultural interests.
9. Interests and restrictions on the use of residual wastes from agricultural, forestal, and food and agricultural activities. Main characteristics. Agricultural interests
10. Transport and distribution of wastes. Application techniques. Incorporation in soil.

The field trips are considered to be formative and supporting and 6 hours of mandatory attendance is required. They will involve a visit to a demonstration of the application of agricultural and livestock subproducts to fields and a visit to a RSU compost plant, each one with being 3 hours.

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5.4.Planning and scheduling

Week	2	3	4	5	6*	7	SS	8	9	10	11*	12	13	14	15	Total
Lectures	T1 T2	T2 T3	T3 T4	T4	T4 T5 T6	T8		T9	T10	T11	T11		T12 T13	T13	T14	
Hours	2	1	2	1	2	2		2	2	1	2		2	2	1	30
problem based learning			T3		T4			T9					T12			
Hours			1		1			2					2			6
Laboratory sessions/Seminars	T2	T3 T4	T3 T4	T4	T4	T7	T8		T10		T12	T12	T13			
Hours	2	2	2	2	2	2			2		2	2	2			18
Technical visits											S1				S2	
Hours											3				3	6
Assesment tasks																2
Individual work	5	6	6	6	6	5	5	8	5	5	6	5	5	5	5	88

5.5.Bibliography and recomended resources

Basic bibliography

1. Guerrero García, A. 1990. El suelo, los abonos y la fertilización de los cultivos. MundiPrensa.
2. Moreno, J; Moral R. (Eds.) 2008.Compostaje. MundiPrensa.

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3. Saña Vilaseca, J. et al. La gestión de la fertilidad de los suelos: fundamentos para la interpretación de los análisis de suelos y la recomendación de abonado. MAPA.
4. Stoffella, P.J; Kahn, B. A. (Eds.). 2005. Utilización de compost en los sistemas de cultivo hortícola . MundiPrensa
5. Tchobanoglous G; Thiesen H; Vijil A. S. 1998. Gestión integral de residuos sólidos, Volumen I y II. Mc Graw Hill.

Complementary bibliography

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- Varios autores. 2006. Fertilización nitrogenada. Guía de actualización. Informaciones Técnicas. Gobierno de Aragón. Número extraordinario.
- Vázquez, E; Josa, J.M; Alcalá del Olmo, J. 1996. Actuaciones en infraestructuras para la gestión de residuos sólidos urbanos. Centro de Publicaciones. Ministerio de Medio Ambiente. Dirección General de Calidad y Evaluación Ambiental. Madrid.