SYLLABUS

1. COURSE DESCRIPTION

Degree:	**Biotechnology**
Course:	**Environmental Biotechnology**
Module:	**Optional Training**
Department:	**Molecular Biology and Biochemical Engineering**
Academic Year:	**2017-18**
Term:	**Second**
ECTS credits:	**6**
Year:	**3rd year**
Type:	**Optional**
Language:	**Spanish**

Course Model:	**C1**	
a. Basic learning (EB):		**60%**
b. Practical learning (EPD):		**40%**

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2. LECTURERS

Coordinator	
Name:	**Aroa López Sánchez**
School:	**School of Experimental Sciences**
Department:	**Molecular Biology and Biochemical Engineering**
Area:	**Microbiology**
Office Hours:	**Mondays, Wednesdays: 15.00 – 18.00** **(Please contact previously through e-mail)**
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3. TOPICS

1. Introduction to Environmental Biotechnology:
- Concept of waste
- Pollution: types and sources
- Biotechnology application to environmental problems

2. Environmental monitoring:
- Biomarkers
- Toxicity bioassays
- Biosensors

3. Bioremediation:
- Bioremediation concept
- Factors that determine the effectiveness of bioremediation. Biodegradability and bioavailability
- Natural attenuation
- Biostimulation and bioaugmentation
- Techniques in situ and ex situ

4. Biodegradation of natural compounds:
- Biodegradation of cellulose, hemicelluloses and lignin.
- Residues from the production of olive oil.
- Biodegradation of cyanides
- Oil biodegradation

5. Biodegradation of xenobiotics:
- Biodegradation of chlorinated polychlorinated biphenyls and dioxins.
- Biodegradation of nitroaromatic compounds.

6. Phytoremediation and rhizoremediation:
- Phytoremediation
- Rhizodegradation.
- Stimulation of phytoremediation
.
7. Metal bioremediation
- Biosorption and bioaccumulation
- Bioaccumulation
- Biomineralization

8. Environmental technology in liquid fluids.

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- Conventional treatment in Urban Wastewater Treatment Plant: Water and Sludge Line
- Biological reactors. Oxygen requirements
- Stabilization and dehydration of sludge

9. Environmental technology in solid materials.
- Biorefinery of organic materials.
- Treatment of biodegradable solid materials by vermicomposting.
Foundation and factors that influence the process. Ecotechnology.

10. Environmental technology in gas streams
- General notions about the dispersion, separation and/or elimination of atmospheric pollutants.
- Biotechnology for the treatment of atmospheric emissions: Biofilters, Biopercoladores and Biolavadores.