TEACHING MODULES INFORMATION
EMJMD WACOMA (academic year 2018/19)

1.	**Module Title:** Ecotoxicity tests in Risk Assessment.
2.	**Module Code:** (not necessary yet)
3.	**Maximum Number of Students:** 16
4.	**Total ECTS Credits:** 2 ECTS
5.	**Month: April-June** First Year-Second Semester
6.	**Notional Learning Hours (Please fill a number in box)**: **(a) Contact Time - e.g in the classroom, or fieldwork** **(b) Private Study - reading time, preparing and taking assessments** **Format of Teaching:** Lectures 6 Hours (a) Laboratory……..…..8 Hours (a) Other (Private study)……..……36 Hours (b) **Teaching Strategy:** This theoretical input of this module establishes the basis for the correct design, development and application of the different techniques (toxicity tests, determination of lethal or sublethal responses, determination of the integrity of the ecosystem, etc.) to assess toxicity of anthropogenic sources of contamination. The module is developed mainly in the laboratory, where the students design and learn a complete experimental study for the evaluation of the environmental quality of coastal systems. These are practices that are performed in the laboratory will be conducted in sessions with time limitation. It is considered opportune that the practical classes are carried out with a maximum number of 16 students per session and grouped in pairs, so as to enhance teamwork and the exchange of ideas.
7.	**Convener:** MLaura Martín
8.	**Institution:** University of Cadiz
9.	**Level (Please tick Y):** Master degree
10.	**Language(s) of Tuition**: English
11.	**Pre-requisites:** • Not special requirements are need except some background in lethal and sublethal toxicity. • Recommendable to have some experience dealing with environmental risk assessment regulation framework. .

12.	**Co-requisites:** None
13.	**Programme(s) for which module is core:** **Erasmus Mundus Joint Master Degree in Water and Coastal Management (WACOMA)**
14.	**Module Description - The Purpose or Aims:** Toxicity tests have been carried out for a variety of purposes, from establishing sediment and water quality standards (eg, defining safety limits or acceptable concentrations of a pollutant), or monitoring their effects from various types of effluents, especially when they contain a complex mixture of chemicals whose precise composition is unknown. The main aim of this module is to involve the students in the acquirement of ecotoxicology concepts as a tool for environmental monitoring, and concretely, learn the most used methodologies worldwide for lethal and sublethal toxicity assessment of environmental stress agents.
15.	**Learning Outcomes:** After completing this module the student should be able to determine lethal and sublethal toxicity of anthropogenic sources of contamination. Moreover, the student will be able to determine environmental risk guidelines for environmental risk assessment.
16.	**Summary of Course Content:** 1. Introduction to basic techniques based on biological / ecological response measures for environmental quality assessment 2. Introduction to basic ecotoxicological techniques under laboratory conditions: toxicity bioassays with equinoderms, bivalves and fish. 4. Techniques for environmental risk assessment calculation: Predictive no effect concentrations.
17.	**Key Skills Taught:** Ecotoxicology. Environmental Risk Assessment.
18.	**Assessment Methods:** Students will have to calculate the risk of different substances taking into consideration the results obtained in the Laboratory. They will have to discuss the environmental implications of obtained results for environmental regulatory framework Students will have to present the assessment in a written format.

19. **Assessment Criteria:**

A successful candidate should have or be able to do the following:

Threshold

A basic understanding of the appropriate science and modelling approach and a reasonable understanding of the model results and their implications.

Good

A good understanding of the science and correct model results which are presented and interpreted to a good standard, with some reference to independent literature data and results.

Excellent

A good to excellent understanding of the science and correct model results which are presented and interpreted to a high standard, with plenty of references used for comparisons and to critically evaluate the results.

20. **Resource Implications of Proposal and Proposed Solutions:**

(Recommended Bibliography: compulsory, optional, other sources of information)

ASTM International. (2004). Standard guide for conducting acute toxicity test starting with embryos of four species of saltwater bivalve molluscs. E724 – 98.

AZUR Environmental, Microtox M500 Manual, A toxicity testing Handbook. Carslbad, CA, USA, 1998.

Beiras R., Vázquez E., Bellas J., Lorenzo J.I., Fernández N., Macho G., Mariño J.C., Casas L. 2001. Sea-urchin embryo bioassay for in situ evaluation of the biological quality of coastal seawater. Estuar. Coast. Shelf S., 52: 29-32.

EC, 1994. Risk assessment of existing substances: technical guidance document, XI/919/94-EN No. European Commission.

EC, 1996. Technical Guidance Document in Support of Commission Directive 93/67/EEC on Risk Assessment for New Notified Substances and Commission Regulation (EC) No. 1488/94 on Risk Assessment for Existing Substances. European Commission.

ECETOC, 1993. Environmental hazard assessment of substances.

ECETOC Document No. 51. European Centre for Ecotoxicology and Toxicology of Chemicals.

EMEA, 1998. Note for Guidance: Environmental Risk Assessment for Veterinary Medicinal Products other than GMO containing and Immunological Products. EMEA, London (EMEA/CVMP/055/96).

EMEA, 2005. Note for Guidance on Environmental Risk Assessment of Medicinal Products for Human Use, MPC/SWP/4447/draft.

The European Agency for the Evaluation of Medicinal Products (EMEA), London European Commission, 2003. Technical Guidance Document on Risk Assessment in Support of Commission Directive 93/67/EEC on Risk Assessment for New Notified Substances, Commission Regulation (EC) No. 1488/94 on Risk Assessment for Existing Substances, and Directive 98/8/EC of the European Parliament and of the Council Concerning the Placing of Biocidal Products on the Market Part II.

EUR 20418 EN/2 Joint Research Centre, Ispra, Italy (2003) MSFD (Marine Strategy Framework Directive), 2008. Directive 2008/56/EC of the European Parliament and the Council of 17 June, 2008 Establishing a Framework for Community Action in the Field of Marine Environmental Policy. http://ec.europa.eu/environment/marine/eucoast-and-marine-policy/marine-strategy-frameworkdirective/index_en.htm.

OECD/OCDE. (2013). Oecd Guidelines for the Testing of Chemicals, (26 July 2013), 1–24.

Specific Resource Implications for Students:

Internet access to Science Direct is recommended.

21.	**Does this module replace existing provision? If so, please indicate modules to be replaced:** Not /Applicable
22.	**Start Date:** April, First Year, Second Semester
23.	**Is it intended that the module be available every year?** Yes