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

1.	**Module Title:** Chemical and ecotoxicological guidelines for management of dredged materials in open waters
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 or laboratory.** **(b) Private Study - reading time, preparing and taking assessments.** **Format of Teaching:** Lectures 8 Hours (a) Laboratories or Practicals 6 Hours (a) Other (private study) 36 Hours (b) **Teaching Strategy:** This module, as a theorical programme, 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.) for sediment and dredged material monitoring. In order to settle knowledge, students will be involved in the discussion of practical cases where advantages and limitations of the use of this monitoring strategy will be evaluated. The systematic analysis of documents and situations of all kinds is a type of task in which what is sought is to systematically observe situations or products elaborated to draw conclusions about a structure and value. You can learn a lot by observing and analysing what others do and how they do it. To some extent, this type of task has a certain similarity with the systematic observation of reality, but it differs because it allows a more relaxed work in which the process of contrasting opinions plays a very important role in broadening the points of view about how these types of issues may exist and are relevant in this type of learning.
7.	**Convener:** Mª Gemma Albendín García (Área de Toxicología)
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 and analytical chemistry. • It is advisable 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:** The content of this module intends to apply the methodology used for the integration of different LOEs for the evaluation and management of sediment and dredging material. It will be studied the advantages and disadvantages associated with the incorporation of sediment toxicity bioassays and new early warning measures (biomarkers) in the evaluation and management of dredging material. In the same way, the legal context of the management of dredging material in Spain and in other countries will be analyzed
15.	**Learning Outcomes:** After completing this module, the students should be able to apply their knowledge on the calculation of sediment quality guides to determine ecotoxicological quality guidelines for the evaluation of sediment and dredging material.
16.	**Summary of Course Content:** 1. Life cycle of sediments. Sustainability and management. 2. Legal framework of sediment management. Sediment quality guidelines and action levels. Technologies and strategies for waste management and dredging material. 3. Sediment management: Criteria, considerations and management options.
17.	**Key Skills Taught:** Analytical Chemistry. Ecotoxicology. Environmental Risk Assessment.
18.	**Assessment Methods:** Students will have to critically analyze a research work in which the methodology for dredged material monitoring has been applied. They will have to discuss the suitability of the methodology used. Students will be encouraged to present new proposals in order to improve the performed research. 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.

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.

Simeonov, V (2003). Environmentric strategies to classify, interpret and model risk assessment and quality of environmental systems.Clean Technol. Environ. Policy, 5, pp. 190-199

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:**

The module fits in the area of “Chemical analysis of water quality”

22. **Start Date:**

First Year, Second Semester

23.	**Is it intended that the module be available every year?** Yes