

TEACHING MODULES INFORMATION

EMJMD WACOMA (academic year 2018/19)

1.	Module Title: Weight of Evidence Assessment of Chemical Contamination in Aquatic Environments.
2.	Module Code: (not necessary yet)
3.	Maximum Number of Students: 24
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 10 (a) Other (Analysis of documents and cases of study) 4 (a) Other (private study) 36 (b) Teaching Strategy: Theoretical lectures explaining the Weight of Evidence Approach methodology for polluted sites assessment will be taught to students. 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 analyzing 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 these types of issues may exist and are relevant in this type of learning.
7.	Convener: Roberta Guerra
8.	Institution: University of Bologna
9.	Level (Please tick Y): Master degree
10.	Language(s) of Tuition: English

11.	<p>Pre-requisites:</p> <ul style="list-style-type: none"> • Not special requirements are needed except some background in contamination, bioaccumulation, bioavailability of contaminants and toxicity analysis. • Recommendable to have some experience dealing with decision-making framework for environmental quality regulation.
12.	<p>Co-requisites: None</p>
13.	<p>Programme(s) for which module is core: Erasmus Mundus Joint Master Degree in Water and Coastal Management (WACOMA)</p>
14.	<p>Module Description - The Purpose or Aims: WoE (Weight of Evidence) refers to integration of data generated from multidisciplinary environmental studies involving multiple, independent LoE (Line of Evidence), which typically comprise both chemical and biological measurements. It is a determination related to possible ecological impacts based on multiple LoE. WoE assessments provide three types of information: (1) relative certainty of adverse environmental effects due to stressors; (2) possible causation; and (3) key uncertainties that, if resolved, will improve management decision-making. The end goal of this module is to determine and predict thresholds/tipping points for the function of specific ecosystems to contaminants and/or other stressors, and thus provide reliable information for decision-making in environment quality assessment.</p>
15.	<p>Learning Outcomes: After completing this module, the student should be able to design monitoring research work that addresses environmental pollution assessment. Moreover, the student will be able to propose environmental protection strategies based on the integration of the most suitable LoEs.</p>
16.	<p>Summary of Course Content:</p> <ul style="list-style-type: none"> - Concept definition. - Introduction to Weight of Evidence. - Lines Of Evidence (LoE) in a Weight of Evidence Approach. - Role of Marine Ecotoxicology in Weight of Evidence. - Weight-of-evidence evaluation in environmental assessment: cases of study. - Future possibilities and probabilities: Major environmental stressors.
17.	<p>Key Skills Taught: Analytical Chemistry Ecotoxicology. Decision-making in an Environmental Regulatory framework.</p>
18.	<p>Assessment Methods: Students will have to critically analyze a research work in which the methodology WoE had been used for monitoring polluted marine areas. They will have to discuss the suitability of the use of certain LoEs and the results obtained in the research work. New proposals in order to improve the performed research will be more than welcome. Students will have to present the assessment in a written format.</p>

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)

ECHA (European Chemicals Agency), 2010. Practical Guide 2: How to Report Weight of Evidence. Helsinki, Finland. http://echa.europa.eu/documents/10162/13655/pg_report_weight_of_evidence_en.pdf.

ECHA, 2014. Principles for Environmental Risk Assessment of the Sediment Compartment. In: Proceedings of the Topical Scientific Workshop, Helsinki, Finland, 1e8 March, 2013. http://echa.europa.eu/documents/10162/13639/environmental_risk_assessment_final_en.pdf.

Environment Canada and Ontario Ministry of the Environment, 2008. Canada-Ontario Decision-making Framework for Assessment of Great Lakes Contaminated Sediment. Ottawa, ON, Canada. Available at: http://publications.gc.ca/site/archivée-archived.html?url=http://publications.gc.ca/collections/collection_2010/ec/En164-14-2007-eng.pdf.

Environment Canada, 2012. Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance. Prepared by Azimuth Consulting Group, Vancouver, BC, Canada. Available at: <http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=D86920CE2DFE-40CB-985F-60A3EA6069A9>.

Chapman, P.M., Anderson, J., 2005. A decision-making framework for sediment contamination. Integr. Environ. Assess. Manag. 1, 163-173.

Chapman, P.M., Hollert, H., 2006. Should the sediment quality triad become a tetrad, a pentad, or possibly even a hexad? J. Soils Sed. 6, 4-8.

Chapman, P.M., McDonald, B.G., 2005. Using the sediment quality triad in ecological risk assessment. In: Blaise, C., Férard, J.-F. (Eds.), Small-Scale Freshwater Toxicity Investigations, Hazard Assessment Schemes, vol. 2. Kluwer Academic Press, Netherlands, pp. 305-330.

Chapman, P.M., Smith, M., 2012. Assessing, managing and monitoring contaminated aquatic sediments. Mar. Pollut. Bull. 64, 2000-2004.

Chapman, P.M., McDonald, B.G., Lawrence, G.S., 2002. Weight of evidence frameworks for sediment quality and other assessments. Hum. Ecol. Risk Assess. 8, 1489e1515.

Chapman, P.M., 1990. The sediment quality triad approach to determining pollution-induced degradation. Sci. Total Environ. 97-98, 815-825.

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.

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: April, First Year, Second Semester
23.	Is it intended that the module be available every year? Yes