TEACHING MODULES INFORMATION
EMJMD WACOMA (academic year 2020/21)

1.	**Module Title:** Remote Sensing: algal blooms
2.	**Module Code:**
3.	**Maximum Number of Students:** No limit
4.	**Total ECTS Credits:** 2 ECTS
5.	**Month:** 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 (theory) 6 Hours (a) Laboratories or Practicals Hours Other (computer workshops) 9 Hours (a) Other (tutorials) Hours Other (private study) 36 Hours (b) **Teaching Strategy:** Theoretical lectures in support of practical exercises in the computer laboratory. Lectures: Ocean Colour Remote Sensing. Computer workshops: practical lessons related to the lectures content. Use of Bilko software for satellite data and image processing.
7.	**Convener:** Irene Laiz
8.	**Institution:** University of Cadiz
9.	**Level:** **MASTER**
10.	**Language(s) of Tuition**: ENGLISH
11.	**Pre-requisites:** Basic computer skills.
12.	**Co-requisites:**
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:** Acquiring knowledge related to harmful algal blooms (HABs): - Definition of algal blooms and HABs - Mechanisms responsible for HABs - Climate change and HABs Understanding the basis of the Ocean Colour Remote Sensing: - Introduction to optical oceanography - Types of water: Case 1 and Case 2 waters - Ocean Colour Remote Sensing - Remote sensing data processing levels - Ocean colour sensors - Remote sensing techniques for monitoring HABs
15.	**Learning Outcomes:** At the end of this course the students should: - Understand the importance of forecasting and monitoring HABs - Know the basic principles of Ocean Colour Remote Sensing - Know the main techniques for Ocean Colour Remote Sensing - Know how to process satellite data for different water types
16.	**Summary of Course Content:** Theory: - Introduction to HABs - Introduction to optical oceanography - Classification schemes of water types - Ocean Colour Remote Sensing - Remote sensing data processing levels - Ocean colour sensors - Remote sensing techniques for monitoring HABs Computer workshops - Introduction to Bilko. Basic principles of satellite image analysis. - Study of an algal bloom event off the coast of Namibia - Analysis of chlorophyll images on the Mozambique Channel using different algorithms
17.	**Key Skills Taught:** - Ability to process Ocean Colour Remote Sensing data - Ability to identify algal blooms using satellite data - Ability to distinguish the difference between Case 1 and Case 2 waters

18.	**Assessment Methods:** Students will answer questionnaires during the practical lessons (50%). Students will deliver a dissertation (50%) Their score will be based upon the correctness of their answers.
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**: ***Core texts*** Robinson, I (2004). Measuring the Oceans from Space. Springer-Verlag Berlin Heidelberg. 670 pp. Robinson, I. (2010). Discovering the Ocean from Space. Springer-Verlag Berlin Heidelberg. 638 pp.
21.	**Does this module replace existing provision? If so, please indicate modules to be replaced:** This module fits in the area of "Biology of aquatic organisms".
22.	**Start Date:** First year, second semester
23.	**Is it intended that the module be available every year?** Yes