



## Course Syllabus: Advanced Topics in Pelagic Ecology - MarS 323

<b>Division</b>	Biological and Environmental Sciences & Engineering Division
<b>Course Number</b>	MarS 323
<b>Course Title</b>	Advanced Topics in Pelagic Ecology
<b>Academic Semester</b>	Fall
<b>Academic Year</b>	2019/2020
<b>Semester Start Date</b>	08/25/2019
<b>Semester End Date</b>	12/10/2019
<b>Class Schedule</b> (Days & Time)	01:00 PM - 04:00 PM   Mon

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Carlos Manuel Duarte	carlos.duarte@kaust.edu.sa	+966128082842	Level 3, Room 3219, 2, Ibn Al-Haytham (bldg. 2)	by appointment
Susana Requena Agusti	susana.agusti@kaust.edu.sa	+966128082848	3218, 2, Ibn Al-Haytham (bldg. 2)	by appointment

Teaching Assistant(s)	
Name	Email
Sebastian Overmans	sebastian.overmans@kaust.edu.sa

Course Information	
<b>Comprehensive Course Description</b>	<p>The course focuses on different aspects of the ecology of pelagic marine ecosystems. Through a review of the relevant literature, the students will follow progress on the state of the art on the ecology of pelagic marine ecosystems, addressing a suite of ecosystems and their particular specificities. The concepts and major drivers of global change affecting pelagic marine ecosystems will be examined. The subjects addressed will include:</p> <ul style="list-style-type: none"> <li>- Seasonality and natural variability</li> <li>- Ecosystem and food web structure.</li> <li>- Oxygen minimum zones</li> <li>- Deep Sea</li> <li>- The Oligotrophic Ocean</li> <li>- The Arctic Ocean</li> <li>- Global change and the Anthropocene</li> <li>- Climate change</li> <li>- Increased pCO<sub>2</sub> and Ocean Acidification.</li> <li>- Pollution and long-range atmospheric transport</li> <li>- Connectivity among pelagic marine ecosystems</li> </ul>
<b>Course Description from Program Guide</b>	<p>Students from programs other than MarSE must have instructor permission to register for this course. The course will address one or a few central topics in pelagic ecology in-depth. It will primarily be based on seminars in which the students will present and discuss scientific papers. The aims are to acquire knowledge of the state-of-the-art of current research questions, as well as to train communication skills and the ability to critically read research papers. Assessment includes a final oral exam.</p>

<b>Goals and Objectives</b>	The objective of this course is to provide the students with a basic understanding of the ecology of pelagic marine ecosystems, with a focus on particularly relevant cases, as well as to introduce the major drivers of global change affecting pelagic ecosystems across the global ocean. The course will also address practical problems.
<b>Required Knowledge</b>	Previous marine courses and general knowledge of key concepts in ecology and ecosystem science
<b>Reference Texts</b>	Valiela, I. Marine Ecological processes (2015). Springer. Available as ebook from KAUST Library. Duarte, Carlos M. "Global change and the future ocean: a grand challenge for marine sciences." <i>Frontiers in Marine Science</i> 1 (2014): 63. Steffen, Will, Paul J. Crutzen, and John R. McNeill. "The Anthropocene: are humans now overwhelming the great forces of nature." <i>AMBIO: A Journal of the Human Environment</i> 36.8 (2007): 614-621.
<b>Method of evaluation</b>	<b>20.00%</b> - Written report <b>20.00%</b> - Scientific review article presentation <b>60.00%</b> - Attendance and Participation
<b>Nature of the assignments</b>	Presentations to the class based on readings of assigned papers Practical problems addressed in groups
<b>Course Policies</b>	Attendance is mandatory to all lectures. Participation is a significant component of the grade. As a block course, students are expected to be available at any time and on short notice during the block period. Any anticipated absence should be cleared with the instructor by written (email) notification as early as possible. Students with approved absences are responsible for catching up on the materials from their classmates.
<b>Additional Information</b>	It is strongly preferred communications via email.

### Tentative Course Schedule

*(Time, topic/emphasis & resources)*

Week	Lectures	Topic
1	Mon 08/26/2019	Introduction to the course
2	Mon 09/02/2019	Pelagic Food Webs
3	Mon 09/09/2019	Pelagic biogeochemistry
4	Mon 09/16/2019	Practical
5	Mon 09/23/2019	Saudi National day
6	Mon 09/30/2019	Temporal variability
7	Mon 10/07/2019	Metabolism
8	Mon 10/14/2019	Thermal control of pelagic structure and processes
9	Mon 10/21/2019	Practical
10	Mon 10/28/2019	Polar oceans
11	Mon 11/04/2019	Global Ocean Genome
12	Mon 11/11/2019	Practical
13	Mon 11/18/2019	The Twilight and Dark pelagic ocean
14	Mon 11/25/2019	Pollution
15	Mon 12/02/2019	Eutrophication
16	Mon 12/09/2019	Final presentation

#### Note

The instructor reserves the right to make changes to this syllabus as necessary.