

## Annexe A: New/Revised Course Content in OBTL+ Format

### Course Overview

The sections shown on this interface are based on the templates [UG OBTL+](#) or [PG OBTL+](#)

If you are revising/duplicating an existing course and do not see the pre-filled contents you expect in the subsequent sections e.g. Course Aims, Intended Learning Outcomes etc. please refer to [Data Transformation Status](#) for more information.

Expected Implementation in Academic Year	
Semester/Trimester/Others (specify approx. Start/End date)	
Course Author * Faculty proposing/revising the course	Patrick Martin (Asst Prof);#128
Course Author Email	pmartin@ntu.edu.sg
Course Title	Blue Planet: How the Oceans Work
Course Code	ES5003
Academic Units	0
Contact Hours	39
Research Experience Components	

## Course Requisites (if applicable)

Pre-requisites	None
Co-requisites	
Pre-requisite to	
Mutually exclusive to	
Replacement course to	
Remarks (if any)	

## Course Aims

The oceans are the largest habitat on our planet, and they are a fascinating environment that is physically, chemically, and biologically different from the land environment we humans are used to. Yet we depend on healthy oceans in many ways, for example to regulate our climate and provide food. This course aims to teach you how the oceans work as a system, and so will cover physical, chemical, and biological oceanography. You will learn about coastal environments and the open ocean, and from shallow waters to the deep abyssal plains. We will look at how ocean currents flow and why they are important, at why seawater has the chemical composition that it does, at how organisms have adapted to live in ocean environments, and at how different marine ecosystems, including coral reefs, function. The course will also examine in what ways we are threatening the health of the oceans, and how we can better preserve the oceans. The course thus aims to foster a fascination and appreciation for the oceans, and to promote ocean literacy amongst students from diverse disciplinary backgrounds. As an unrestricted elective, the course will be accessible to all students with an interest in the oceans, regardless of your major programme (non-science students with an interest in the oceans are extremely welcome).

## Course's Intended Learning Outcomes (ILOs)

Upon the successful completion of this course, you (student) would be able to:

ILO 1	Explain the basic principles of the physics, chemistry, biology, and ecology of the oceans;
ILO 2	Explain how the oceans affect Earth's climate;
ILO 3	Distinguish different marine ecosystems based on functional characteristics;
ILO 4	Explain in what ways human activities threaten the health of the oceans, and how we might be able to mitigate these impacts;
ILO 5	Communicate the importance of the oceans to a general audience

## Course Content

The course will consist of 11 lectures that will outline what you are expected to know by the end of the course. In the lectures, I will explain the key concepts using diagrams and figures, show video clips to visualize these concepts, occasionally perform practical demonstrations to illustrate aspects of the ocean environment, and use clicker questions to test your understanding. Your knowledge will be assessed through two mid-term multiple-choice exams. In addition, you will prepare a short video as a group assignment (3–6 students per group) in which you explain one aspect of the oceans in a way that would appeal to, and be understood by, the general public.

## Reading and References (if applicable)

The library has copies of numerous introductory oceanography textbooks, each of which covers most of the course contents in more than enough detail. The lectures draw material specifically from the textbook by Trujillo & Thurman (below), of which several copies are available in the library, including of earlier editions. Required textbook reading will not be set for this course. Trujillo A.P. & Thurman H.V. (2016) Essentials of Oceanography 12th Edition. Pearson, ISBN-13: 978-0134073545

## Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Course introduction; History of Oceanography; Tectonics and the seafloor	1,2,3,4		In-person	
2	Physical circulation: why (and how) the ocean is in motion	1,2,3,4		In-person	
3	Ocean chemistry: why the sea is salty	1,2,3,4		In-person	
4	Marine biology: how life has adapted to the sea	1,2,3,4		In-person	
5	Marine ecology: oceanic webs of life	1,2,3,4		In-person	
6	Oceanography in practice: how scientists study the sea	1,2,3,4		In-person	
7	Mid-term exam 1	Oceanography in practice: how scientists study the sea		In-person	

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
8	Around the edges: ecosystems in shallow seas	1,2,3 ,4		In-person	
9	Into the abyss: deep-sea ecology	1,2,3 ,4		In-person	
10	Ocean and the Earth System: how the ocean controls climate	1,2,3 ,4		In-person	
11	Ocean in peril: global and local threats to marine ecosystems	1,2,3 ,4		In-person	
12	Marine conservation: how we can protect the ocean	1,2,3 ,4		In-person	
13	Mid-term exam 2	1,2,3 ,4		In-person	

## Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lectures	Lectures will efficiently outline the knowledge you are expected to acquire during the course. They will illustrate the critical concepts of the subject through figures, videos, and demonstrations. Clicker questions will be used to test how well you are following the material.
Online quizzes	Two multiple-choice quizzes will be made available on NTULearn to practice exam-style questions without being assessed. You will be allowed multiple attempts, so that you can use the quizzes as a way of deepening your knowledge.
Group video	Producing a short video to explain a specific aspect of how the oceans work will further deepen your knowledge of oceanography. Because the video should be aimed at the general public, you will also learn how to communicate technical concepts in an accessible way, and to explain how important the oceans are for our societies.

## Assessment Structure

Assessment Components (includes both continuous and summative assessment)

No.	Component	ILO	Related PLO or Accreditation	Weightage	Team/Individual	Rubrics	Level of Understanding
1	Continuous Assessment (CA): Others([quiz/test])	1,2,3	Knowledge, intellectual flexibility and critical thinking	35			
2	Continuous Assessment (CA): Others([quiz/test])	1,2,3	Knowledge, intellectual flexibility and critical thinking	35			
3	Continuous Assessment (CA): Others([group or individual projects/evaluations] Group video)	1,3,4	Knowledge, passion and communication	30			

Description of Assessment Components (if applicable)

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Formative Feedback

You will receive feedback on your understanding during lectures by answering clicker questions. In addition, 2 multiple-choice quizzes will be made available to you on NTULearn during the semester to practice questions for the mid-term tests (quizzes will not be assessed, and multiple attempts will be allowed, so that you can use them as a learning opportunity).

## NTU Graduate Attributes/Competency Mapping

This course intends to develop the following graduate attributes and competencies (maximum 5 most relevant)

Attributes/Competency	Level
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# Course Policy

## Policy (Academic Integrity)

## Policy (General)

### (1) General

You are expected to attend all lectures punctually and take all scheduled assignments and tests by due dates. You are expected to take responsibility to follow up with course notes, assignments and course related announcements for classes you have missed. You are expected to participate in all clicker questions during class.

## Policy (Absenteeism)

### (2) Absenteeism

Absences from lectures will likely affect your overall course grade, so you are strongly encouraged to attend all lectures. If you miss a mid-term exam without a valid reason (e.g. illness as supported by a medical certificate), you will be given zero marks for it. If you have a valid reason for missing a mid-term exam, you need to inform me as soon as possible, and you will need to sit a make-up exam. Since you will have longer to prepare, any make-up exams will be harder than the ordinary exams.

## Policy (Others, if applicable)

### (3) Compulsory Assignments

You are required to submit the video presentation by the due date, and no extensions will be granted. Exceptions may be made if you have a valid reason, e.g. a long illness as supported by a medical certificate. If you do need an extension for a valid reason, you must inform me as soon as possible by e-mail (pmartin@ntu.edu.sg). Any extension is at the instructor's discretion.

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