
Marine Coastal and Delta Sustainability for Southeast Asia

Learner's Manual

Oceanography **LOB 10403**



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1.0 Introduction

This course is offered at the beginning of the programme to expose students to the maritime environment. The knowledge imparted to students will give them the basic understanding required in order to be involved in maritime operations and the management of maritime activities. Amongst others, the knowledge garnered will enable them to plan port activities and scheduling ships passages

Upon completion of this course students should be able to:

1. Explain the evolution of the ocean basin, the features of the marine provinces and the theories of tides.
2. Illustrate the air-sea interaction with its effects on offshore activities
3. Calculate tides for standard and secondary ports
4. Examine the elements in ocean circulation and the types of waves.
5. Differentiate between the various type of marine provinces and marine sediments.



2.0 Course Structure

2.1 Learning Schedule

Topic	Description
Topic 1	<p>INTRODUCTION TO OCEANOGRAPHY</p> <ol style="list-style-type: none"> 1 Characteristics and geographic features of Earth's principal oceans 2 Differences between an ocean and a sea 3 Early history of ocean exploration 4 Origin of atmosphere and oceans
Topic 2	<p>PLATE TECTONICS AND THE OCEAN FLOOR</p> <ol style="list-style-type: none"> 1 The continental drift theory 2 The theory of plate tectonics 3 Types of plate boundaries 4 Plate tectonics and Evolution of ocean Islands
Topic 3	<p>MARINE PROVINCES & MARINE SEDIMENTS</p> <ol style="list-style-type: none"> 1 Methods of direct and remote sea floor investigation 2 Features of the continental margins, ocean basin floor and mid-ocean ridge 3 Active and passive continental margins 4 Origin of submarine canyons and turbidity currents 5 Subduction zones and associated deep-sea trenches 6 Differences between transform faults and fracture zones. 7 Main types of marine sediments
Topic 4	<p>PROPERTIES OF SEA WATER</p> <ol style="list-style-type: none"> 1 Structure, geometry and polarity of water molecule 2 Thermal properties of water



- 3 The importance of water in transferring heat around the earth
- 4 Seawater salinity and salinity process
- 5 Seawater density and ocean layering Pycnocline, thermocline and halocline.

Topic 5

AIR-SEA INTERACTION

- 1 Causes of uneven solar heating on earth
- 2 Nature, origin and consequences of Coriolis effect
- 3 Circulation cells
- 4 Pressure belts, wind belts and boundaries
- 5 Weather and climate
- 6 Formation of tropical revolving storms and types of destruction caused by them

Topic 6

OCEAN CIRCULATION

- 1 Measurement of ocean currents
- 2 Subtropical surface gyres
- 3 Western intensification and boundary currents
- 4 Ekman transport
- 5 Upwelling, downwelling and their effects on marine life
- 6 Origin and effects of deep-water circulation
- 7 El Nino Southern Oscillation.

Topic 7

WAVES

- 1 Origin of waves
- 2 Orbital motion and differences between deep and shallow-water waves
- 3 Relationship between a “sea” and a swell
- 4 The wave trains
- 5 Destructive and constructive interference
- 6 Wave reflection and refraction
- 7 Origin, coastal effects and hazards associated with tsunamis

Topic 8

TIDES AND TIDAL STREAMS

- 1 The theories of tides
- 2 Monthly tidal cycle
- 3 Variations in the orbit of the earth and moon and



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- changes to tidal forces
- 4 Diurnal, semidiurnal and mixed tidal patterns
- 5 Types of tidal currents and their effects
- 6 Understanding Tide Table and tidal calculation.

Topic 9

BEACHES AND SHORELINE PROCESSES

- 1 Characteristics of beaches and coastal regions
- 2 Seasonal changes on beaches
- 3 Longshore currents and longshore drifts
- 4 Formation of coastal beaches
- 5 Local changes in coastline elevation
- 6 Climate change and nature of coastline
- 7 Formation and evolution of barrier islands
- 8 Types of hard stabilization and their effects on shorelines.



2.0 Course Structure

2.2 Mode of Delivery



Course were thought online using Microsoft Teams application. Link to the webinar will be provided by teacher through email or e-learning platform.



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2.0 Course Structure

2.3 Teaching Strategy



Teaching and Learning

Teaching and learning will be via lecture, collaborative learning, group discussion and peer presentation. Students will also be required to conduct self-study and information gathering on their own for certain topics, homework, and assignments



Assessment

Assessment will be both formative (with feedbacks) and summative. Students learning will be assessed using quizzes, oral presentations, tests and group assignments. Peer evaluation may be part of the assessment of a teamwork.







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2.0 Course Structure

2.4 Learning Material



Lectures

-  Oceanography slides shb chapter1
-  Chapter 2
-  Oceanography slides shb chapter3
-  Oceanography slides shb chapter4

All learning materials such as lecture notes, videos and articles related to the learning topics will be made available online in e-Learning platform.



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2.0 Course Structure

2.3 Additional Learning Material (video/notes/articles)

Video Related to Course

 Oceanography (T01)

 Oceanography (T02)

 Oceanography (T01)

You need to discuss about coriolis effect here.

 Tutorial 2

All additional materials such as lecture notes, videos and articles related to the learning topics will be made available online in e-Learning platform.



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2.0 Course Structure

2.4 Assessment

Type of Assessment	% Contribution
Quizzes	10%
Assignment	20%
Written Test	30%
Final examination	40%
TOTAL	100%



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3.0 Course Structure

3.1 Course Reading List

No.	References
1.	Trujillo, Alan P. & Thurman, Harold V (2004), Essentials of Oceanography, 10th Edition, Pearson Prentice Hall, New Jersey.
2.	Thurman, Harold V & Burton, Elizabeth (2007), Essentials of Oceanography, 9th Edition, Pearson Prentice Hall, New Jersey.
3.	Chamberlain, W. Sean & Dickey, Tommy D., (2007), Exploring the World Oceans, 1st Edition, McGraw Hill.
4.	Duxbury, D.B. (1995), Fundamentals of Oceanography, WCB Publisher, UK.
5.	Garrison, Tom (2004), Essentials of Oceanography, Thomson Brooks/Cole, USA.
6.	Summerhayes, C.P. & Thorpe, S.A. (1996), Oceanography: An Illustrated Guide, Manson Publisher, London.

