



Co-funded by the
Erasmus+ Programme
of the European Union

COURSE PRESENTATION

VEB4213

Ocean and Coastal Engineering



UNIVERSITI
TEKNOLOGI
PETRONAS
energising futures



- Coastlines and the coastal areas are not only becoming increasingly important for economic development, but they are also very dynamic zones which are subject to threats caused by environmental and anthropogenic influences. Thus, the knowledge in ocean and coastal engineering is important. The main objective of this course is to develop understanding on the fundamental principles in ocean and coastal engineering. This course introduces the fundamental principles and concepts of ocean and coastal engineering. It gives an overview in a number of subjects including wave theories, wave transformations, design wave specifications, wind, tides, sediment transport, coastal and estuarine morphology.
- Ocean and Coastal Engineering a subject that requires interactive discussions, sharing of exciting examples and case studies for enhanced understanding and appreciation. This skill is developed through series of lectures/modules, discussion related to case studies during execution of project assigned. Transferred skills to be assessed by assignment, project report, test and extended assignment. A problem-based learning will be implemented in the class. An adjunct lecture and a virtual field trip will also be conducted to expose the students to the real coastal problems in Malaysia.

Upon completion of this course, students will be able to:

1. Evaluate the properties of offshore and near shore waves, and establish design wave specifications.
2. Assess currents and tidal processes.
3. Formulate sediment budget and perform shoreline evolution analysis.





Chapter	Topic	Contents
1	Introduction to Ocean and Coastal Engineering	<ul style="list-style-type: none">•Terminology of the ocean and coasts•Ocean environmental forces•Introduction to coastal protection measures and their applications
2	Wave Generation	<ul style="list-style-type: none">•Wind and wave•Types of waves•Wave characteristics•Wave theories and their applications•Small-amplitude wave theory•Physical modelling demonstration
3	Wave Transformation	<ul style="list-style-type: none">•Wave shoaling•Wave breaking•Wave refraction•Wave diffraction•Wave reflection•Wave run-up
4	Statistical Properties and Spectra of Sea Waves	<ul style="list-style-type: none">•Random wave profiles and representative waves•Spectra of sea waves•Statistical analysis of extreme waves



Chapter	Topic	Contents
5	Tides and Currents	<ul style="list-style-type: none">•Origin of the tides•Characteristics of the tides•Harmonic analysis & prediction of the tides•Tides in estuaries•Types of currents
6	Coastal Sediment Transports	<ul style="list-style-type: none">•Onshore-offshore sediment transport•Longshore sediment transport•Estuarine processes
7	Coastal Morphology	<ul style="list-style-type: none">•Sediment budget for a coastal system•Estuarine morpho dynamics•Long-term prediction of shoreline changes•Introduction to numerical simulation using commercial software (1-day seminar)