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Course Name: SUSTAINABILITY IN COASTAL CONSTRUCTION

Number of credits: 3 ECTs (equivalent to 2 Vietnamese Credits)

Period: Fall/spring semester

Coordinator	Vietnam Maritime University
Credits	03 ECTS
Lecturers	Tran Duc Phu
Level	Master
Host institution	Vietnam Maritime University
Course duration	30 hours

Summary

The course provides basic knowledge of Changes in climate, Climate change scenarios, The impact of Climate change on buildings, Climate-Adaptable Buildings, Adaptation Approaches for Buildings, Adaptation Strategies and Resilience, Sustainability in coastal construction.

Target student audiences

Master students majoring in Construction project management

Prerequisites

Required courses (or equivalents): NO

Aims and objectives

Students understand an overview of changes in climate, climate change scenarios and the impact of climate change on buildings. Students know about climate-adaptable buildings and adaptation approaches for buildings. Students can basically prepare adaptation strategies and resilience for a region or a building.

Authentic Tasks:

The course provides basic knowledge of impacts of climate change on buildings and how to prepare adaptation strategies and resilience for a region or a building.

Desired learning outcomes:

By the end of the course, successful students will:

Knowledge	<ul style="list-style-type: none"> • Changes in climate; • Climate change scenarios; • The impact of Climate change on buildings; • Climate-Adaptable Buildings; • Adaptation Approaches for Buildings; • Adaptation Strategies and Resilience; • Sustainability in coastal construction.
Comprehensive	<ul style="list-style-type: none"> • Presenting the general knowledge about Changes in climate, Climate change scenarios, The impact of Climate change on buildings, Climate-Adaptable Buildings, Sustainability in coastal construction.



Application	<ul style="list-style-type: none">Adaptation Approaches for Buildings, Adaptation Strategies and Resilience
Analysis	<ul style="list-style-type: none">
Synthesis	<ul style="list-style-type: none">

Overview of sessions and teaching methods

The course will make most of interactive and self-reflective methods of teaching and learning and, where possible, avoid standing lectures and presentations.

Learning methods

- Video presentations
- Project Based Learning
- Literature review
- Brainstorming
- Puzzles
- Query
- Mind map
- Problem-based learning
- Team work

Literature

Compulsory

[1] Handouts of Sustainability in coastal construction.

Recommended

[1] Tran Thuc et. al., 2016. *Climate change and sea level rise scenarios for Viet Nam*. Vietnamese Ministry of Natural Resources and Environment.

[2] IPCC, 2012. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.

Course workload

The table below summarizes course workload distribution:

Activities	Learning outcomes	Assessment	Estimated workload (hours)
In-class activities (30 hours)			
Lectures	Understanding theories, concepts, methodology and tools	Class participation	
Moderated in-class discussions	Understanding basic knowledge of adapting building construction to the effects of climate change.	Class participation and preparedness for discussions	



In-class assignments, homework assignment	Understanding basic knowledge of adapting building construction to the effects of climate change.	Class participation and preparedness for assignments	
Reading and discussion of assigned papers for preparation for lectures	Familiarity with and ability to critically and creatively discuss key concepts, tools and methods as presented in the literature.	Class participation, creative and active contribution to discussion	
Independent work (90 hours)			
Home work and Exercise	Ability to interpret data, analyze objects and use concepts, tools, and methods, and equations to solve problems.	Quality of individual assignments	
Total			120

Course outline

Week	Topic
Week 1	Changes in climate;
Week 2&3&4	Climate change scenarios;
Week 5&6	The impact of Climate change on buildings;
Week 7&8	Climate-Adaptable Buildings;
Week 9	Adaptation Approaches for Buildings;
Week 10	Adaptation Strategies and Resilience;
Week 11	Sustainability in coastal construction.

Course Schedule

Topic 1. Changes in climate	
Learning objectives	<ul style="list-style-type: none"> Understand general knowledge about climate and changes in climate
Learning outcomes	<ul style="list-style-type: none"> Summarize some basics of climate and changes in climate
Student deliverables	Exercise: <ul style="list-style-type: none"> Summarize some basics of climate and changes in climate
Topic materials	<ul style="list-style-type: none"> Handouts provided by lecturer prior to the class time. Video
Outline	1.1 Introduction; 1.2 Causes of climate change; 1.3 Changes in climate.



Topic 2. Climate change scenarios	
Learning objectives	<ul style="list-style-type: none">• Have knowledge of the climate change scenarios and sea level rise for Viet Nam
Learning outcomes	<ul style="list-style-type: none">• Summarize the climate change scenarios and sea level rise for Viet Nam.
Student deliverables	Exercise: 1. Present the climate change scenarios and sea level rise for Vietnamese regions?
Topic materials	<ul style="list-style-type: none">• Handouts provided by lecturer prior to the class time.• Video
Outline	2.1 Emissions scenarios and climate models; 2.2 Climate change, sea level rise global and regional scale; 2.3 Manifestation of climate change and sea level rise for Viet Nam; 2.4 Climate change scenarios for Viet Nam; 2.5 Sea level rise for Viet Nam.
Topic 3. The impact of Climate change on buildings	
Learning objectives	<ul style="list-style-type: none">• Have knowledge of impacts of Climate change on buildings
Learning outcomes	<ul style="list-style-type: none">• Summarize impacts of Climate change on buildings
Student deliverables	Exercise: 1. Summarize impacts of Climate change on buildings?
Topic materials	<ul style="list-style-type: none">• Handouts provided by lecturer prior to the class time.• Video
Outline	3.1 The impact of climate change on building design; 3.2 The impact of climate change on building structures.
Topic 4. Climate-Adaptable Buildings	
Learning objectives	<ul style="list-style-type: none">• Have knowledge of climate-adaptable buildings.
Learning outcomes	<ul style="list-style-type: none">• Present the adaptability in Buildings• Present the definition of ‘Climate-Adaptable Buildings’
Student deliverables	Exercise: <ul style="list-style-type: none">• Present the adaptability in Buildings?• Present the definition of ‘Climate-Adaptable Buildings’?
Topic materials	<ul style="list-style-type: none">• Handouts provided by lecturer prior to the class time.• Video
Outline	4.1 Adaptability in Buildings; 4.2 Definition of ‘Climate-Adaptable Buildings’; 4.3 Synthesis definition of climate-adaptable buildings.
Topic 5. Adaptation Approaches for Buildings	



Learning objectives	<ul style="list-style-type: none">• Understanding Adaptation Approaches for Buildings
Learning outcomes	<ul style="list-style-type: none">• Present the Adaptation Approaches for Buildings
Student deliverables	Exercise: <ul style="list-style-type: none">• Present the Adaptation Approaches for Buildings?
Topic materials	<ul style="list-style-type: none">• Handouts provided by lecturer prior to the class time.• Video
Outline	5.1 Assessment Tools, Methodologies and Metrics; 5.2 Building Design and Policy Responses.
Topic 6. Adaptation Strategies and Resilience	
Learning objectives	<ul style="list-style-type: none">• Have knowledge of mechanization of cargo handling in ports
Learning outcomes	<ul style="list-style-type: none">• Summarize the mechanization of cargo handling in ports
Student deliverables	Exercise: 1. Summarize the mechanization of cargo handling in ports?
Topic materials	<ul style="list-style-type: none">• Handouts provided by lecturer prior to the class time.• Video
Outline	6.1 National Climate Change Strategy; 6.2 Mitigation Strategies; 6.3 Adaptation Strategies; 6.4 Resilience.
Topic 7. Sustainability in coastal construction	
Learning objectives	<ul style="list-style-type: none">• Have knowledge of Sustainability and application in coastal construction
Learning outcomes	<ul style="list-style-type: none">• Summarize the Sustainability in coastal construction
Student deliverables	Exercise: 1. Summarize the Sustainability in coastal construction?
Topic materials	<ul style="list-style-type: none">• Lecture of Sustainability in coastal construction• Video
Outline	7.1 National in Sustainable development; 7.2 Sustainability in coastal construction.

Course Assignments

Course assignments will constitute a multi-part project:

- Assignment #1 - (in-class, online)
- Assignment #2 - (home work)
- Assignment #3 - (home work)
- Assignment #4 - (mostly in-class)



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Grading

The students' performance will be based on the following:

- Assessment**
- Progress assessment (35%):
 - Exercise (20%):
 - Homework (15%):
 - Semi- Final examination (15%)
 - Final assessment (50%):
 - Final examination (50%)

- Evaluation**
- A (8,5 – 10)
 - B (7,0 – 8,4)
 - C (5,5 - 6,9)
 - D (4,0 – 5,4)