



Course Name: **FISHERY OCEANOGRAPHY**

Number of credits: 3 ECTs

Coordinator	Institute of Oceanography
Credits	3 ECTs
Lecturers	Hoang Xuan Ben, Phan Minh Thu, Huynh Minh Sang
Level	BSc.
Host institution	Ho Chi Minh City University of Natural Resources and Environment
Course duration	1 semester (the classes will be scheduled in accordance with the university timetable)
New/revised	New course

Summary

Fisheries oceanography is a science that investigates fisheries resources and their relationships with relevant environmental factors in important to maintain the sustainable management of biological resources through exploitation, forecasting, conservation and management of fisheries resources. Marine fisheries resources are important for countries and territories that are adjacent to or connected with the sea, the total catch (sea and inland) in 2018 was 96.4 million tons, mostly with marine fishery accounting for 84.4 million tons (FAO, 2020). The total of sea catches account 87.6% of all production indicated the function and significance of oceanographic fisheries in ensuring nutritional resources for coastal communities as well as economic development. In 2018, Vietnam's overall fishing output was 3.35 million tons, with 3.19 million tons coming from the sea, accounting for 95% of the total catch (FAO, 2020). According to study results on marine resources in Vietnam waters, the total reserve of marine resources is estimated to be 4.36 million tons, with 1.8 million tons of sustainable exploitation with the targeted products include bottom fish, floating fish, and other resources that are closely linked to marine habitats including coral reefs, seagrass beds and mangrove. Because Vietnam is located in a tropical monsoon climate with the characteristics of its oceanographic conditions change during the year, so the Oceanographic conditions such as current, wave, temperature distribution, salinity, environmental factors, nutrient conditions play a significant impact in the survival of marine life in general and fisheries resources in particular. As a result, findings on the effect and relation of biological and physical elements on fisheries are essential. Furthermore, the subject of forecasting fishing grounds and allowed catches should be handled, as it contributes to biodiversity conservation and exploitation of fisheries resources.

The main topics covered in the curriculum are 4 chapters, following

+ Chapter 1: The concepts of Fishery Oceanography and Fishery: Oceanography is a general science with the aim of studying the marine and oceans. The concepts of fisheries oceanography are changed by the historical stages and studied purpose of the fishery development. According to FAO, Fishery Oceanography is a science that studies and assesses

the fish stock based on oceanographic studies in ocean biology, physics and chemistry and geology. NOAA (National Oceanic and Atmospheric Administration) has added a concept related to Fishery Oceanography that is a better understanding of the influence of environmental conditions on resources for sustainable management of aquatic resources. Thus, "Fisheries oceanography can be broadly defined as study of the interaction between marine fish and their environments across multiple life-history stages", resulted for exploitation, forecasting, conservation and management of aquatic resources. The history of oceanographic research flourished in the early 15th century by European navigators such as surveying missions around the world, discovering new lands and continents such as Ferdinand Magellan, Alminos, Cristofor Columb... In the last 3 decades, the development of marine science and technology with the help of several modern equipment, studies can extend to continents, including the bottom areas and deep sea. In Vietnam, oceanographical activities officially started in the 1922. Up to now, there have been many activities of research and development, conducted especially several aspects of fisheries oceanography.

+ Chapter 2: Oceanographical Features for Fishery Oceanography in Vietnam: The characteristics of the oceanographic factors of Vietnamese waters are dominated by sea currents, wave regimes and topographic factors within the monsoon climate. As the results, Vietnamese marine could be formed geographical - ecological regions with different trend and potential biological resources. In this chapter, the oceanographic factors of Vietnam's marine fisheries are identified, including: marine physical factors and biological and environmental factors. Marine physical factors include temperature, salinity; wind, wave; tide; circulation. Biological and environmental factors include bio-productivity, environment, biological resources and typical ecosystems of tropical seas.

+ Chapter 3: Effects/Relationships of Oceanography parameters on fishery: The change of habitat is one of the important factors affecting the exploitation of marine resources with the aim of identifying specific oceanic structures in ocean/sea. This chapter presents two main issues: (1) the influence of environmental factors on the reproductive biology of fish, including: Environmental factors affecting the life cycle of fish, Effects of temperature and salinity on the distribution of fish stocks, and the influence of ocean currents and tides on the distribution of fish stocks; (2) the impacts of oceanographic factors on marine resources, including: impacts of oceanographic factors on fish stock fluctuations; and the impact of marine factors on fishing activities.

+ Chapter 4: Forecasting the fishing ground and fisheries: Forecasting fishing grounds is the scientific basis for planning exploitation and rational use of marine resources. This chapter provides information on methods used in the assessment of marine fisheries stocks including: methods of assessing growth parameters; method of determining mortality rate and extraction rate; and methods of estimating mining reserves. In addition, forecasting models of fishing grounds are also presented. Forecasting models of fishing grounds include short-term fishing and long-term exploitation as well as building models to evaluate the effectiveness of short-term and long-term forecasts.