



Course summary

The course provides basic knowledge of modelling contaminants transmission processes in marine environment and introduces basic applications of modelling pollution processes in solving practical problems of marine pollution. The main objective of this course is to equip students with knowledge of the processes of the transmission of substances to the marine and ocean environment; Determining the marine environment problem and propose suitable solution; Basic skills to use model in simulating contaminants transmission processes in marine environment as well as work at the individual level and team collaboration to communicate, discuss among individuals in groups to study and report.

The quality of the water in nature affects the condition of ecosystems that all living organisms depend on. The course is divided into five parts that roughly follow the historical overview from the previous section. Topic 1 concentrate on an overview of introduction to the modelling and application, numerical model, additionally, a lecture of "modelling" environment, dealing with issues such as model calibration and verification also involved in this topic Topic 2 includes an introduction to dynamic of current and tides and an overview of analytical and computer-oriented solution techniques as well as an introduction to reaction kinetics. The analytical approaches emphasize the linear models that formed the basis of early water-quality modelling. In addition, the computer-oriented methods provide the quantitative basis for extending the early approaches to address more complex systems. Topic III provides an introduction to the process of substance transmission, this lecture provides general background information on these systems with special emphasis on how their transport regimes are quantified. In addition, I also devote a lecture at the first problems addressed by the pioneers of water-quality modelling: dissolved oxygen and BOD and a detailed discussion of the Streeter-Phelps model. After an overview of the problem and some simple approaches, the remainder of this course focuses on modelling the marine environment and ocean. This is followed by computer-oriented models, including a lecture on the MIKE 21 software package. By the end of the course, successful students will:

- Understanding the role of marine environment modelling
- Presenting the basic knowledge of flow dynamics and hydrography, the basic knowledge of modelling of substance transmission in marine environment.
- Simulating the processes of substance transmission in marine environment.
- Analysis of natural systems and design of numerical models
- Using basic models in simulating contaminants transmission processes in marine environment.

- Presenting the basic knowledge of flow dynamics and hydrography, the basic knowledge of modelling of substance transmission in marine environment.
- Simulating the processes of substance transmission in water
- Analysis of natural systems and design of numerical models
- Using basic models in simulating contaminants transmission processes in marine environment.