

Curriculum of Hydrosphere Environmental Group

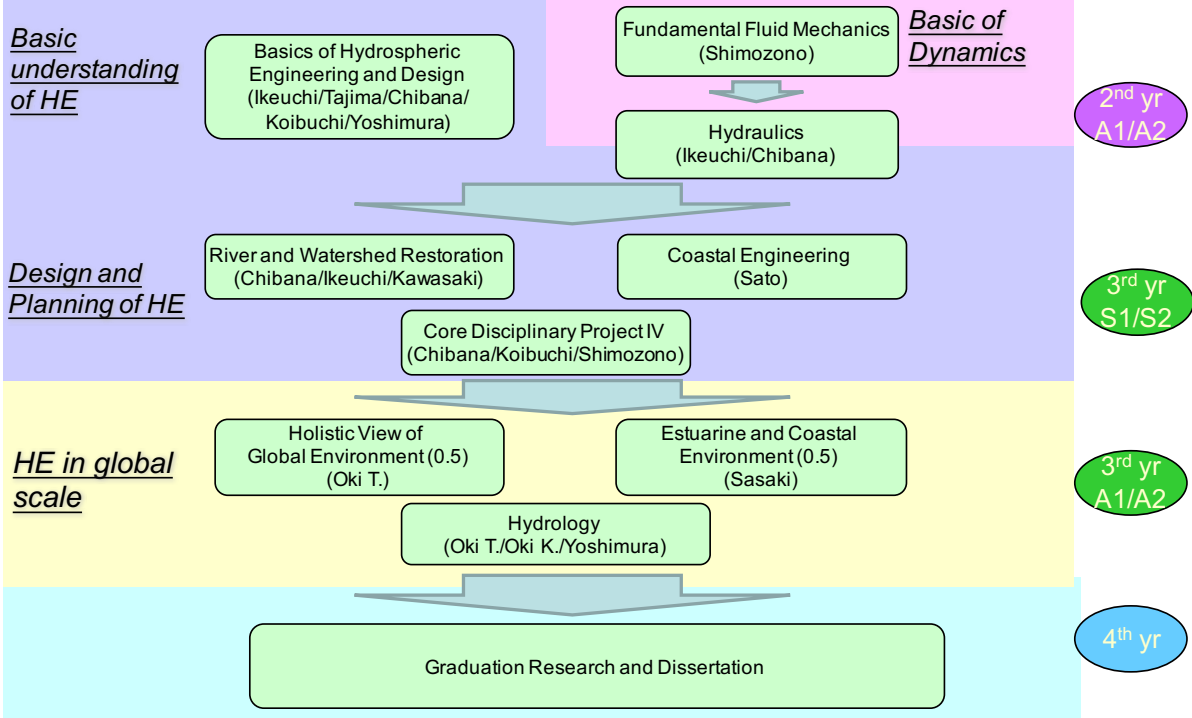
1st version: 2017 Mar. 2

The Hydrosphere Environmental (HE) Group develops human resources who flexibly study the proper relationship between the natural phenomenon of the hydrosphere (atmosphere, land area, ocean, and the boundary area connecting each) and human society from global to regional scale. Students will acquire advanced expertise in each area (hydrology, rivers, and coasts) with holistic view of the entire hydrosphere.

The undergraduate school offers a curriculum that starts with basic common capacity building of each area and lets the students reach the entrance of each specialty. In each subject, students interdisciplinary study and exercise to cover each field. The point is that the order of each subject in the curriculum is clear. In the 2nd year A1/A2 terms, students learn physics and dynamics, which are the basis of the phenomenon in the hydrosphere, in Fundamental Fluid Mechanics, and apply the knowledge to understand the practical movement of water in rivers and water channels in Hydraulics. On the other hand, in Basics of Hydrospheric Engineering and Design, students learn how these theories are utilized in planning, designing and managing the actual hydrosphere environment. Continuing for the 3rd year S1/S2 terms, in River and Watershed Restoration and Coastal Engineering, students will learn specific examples of planning and design theory on rivers and coasts, respectively. In addition, in Core Disciplinary Project IV, students will apply the learnt theories to the practical situations, such as field sites and/or experimental channels, and grasp the realistic sense of rivers and coasts. Furthermore, in the 3rd year A1/A2 terms, students will learn the ways of the social infrastructure to harmonize the global environment / nature and human society through discussions in Holistic View of Global Environment and Estuarine and Coastal Environment, and it is followed by studying the state of the global water circulation and its mechanism in Hydrology.

At the graduate school, each subject is broken down with less dependency among subjects as much as possible, and it is provided in a way that students with various specialties (including those other than HE Group) can take according to their needs. In Advanced Hydrology, in addition to the knowledge earned in Hydrology, students learn more deeply the connection between the flow of water as a natural phenomenon and the human society. Coastal Engineering is divided into Advanced Coastal Engineering, which approaches from the practical aspect of design, planning and management, and Coastal Hydrodynamics, which specializes in understanding natural phenomenon at the coast. In River Engineering, which succeeds River and Watershed Restoration, students will learn the legal framework, policy and planning theory concerning flood control and water use, and design, construction and management of the facilities. Further, in Fundamental Ocean Engineering (common subject of engineering), students learn the basics of marine engineering to realize sustainable marine use. In Flood Disaster Simulation, students learn practical numerical methods through programming basic theories learned so far and through numerical calculations using them. In Sediment Transport in Hydrosphere, students learn the mechanism of sediment transport on rivers and coasts. In Integrated Knowledge on Disaster and Environmental Risk Management, students integrate and fuse huge information such as those from artificial satellites and computer simulations to understand the details of environmental problems and large-scale natural disasters, and utilize the knowledge for countermeasures. Finally, in the summer semester Hydrospheric Science Project and the winter semester Seminar on Flood Disaster Mitigation, students acquire, organize, and analyze various data on the hydrosphere environment across multiple areas, by taking into account what he/she learned in various multiple subjects so far, and make presentation in project/seminar. Through this experience, students will master the practical skills necessary for subsequent Master's (Doctor's) research.

Hydrosphere Environmental Group (Undergrad)



Hydrosphere Environmental Group (Grad)

+ Mitigation Strategy against Major Flood Disaster core subject
* Ocean Alliance core subject

