Subject: Practice on Flood Hazard Modeling & Flood Forecasting

Course number：DMP386E
Instructor：Ass. Prof. Kazuhiko FUKAMI
Term / Time：Fall through Spring

1 Course Description

The objective of this course is to build capacities for undertaking hydrological predictions in poorly-gauged basins. The course first introduces the fundamentals of rainfall-runoff models and flood inundation models. Then it describes finite difference methods to solve simple differential equations for flood hazard modeling. The basic knowledge with computer programming exercises will lead for understanding the background of the "Integrated Flood Analysis System: IFAS," which is a software developed by ICHARM for rainfall-runoff analysis. During the second half of the course, the participants will learn how to apply IFAS for flood predictions using IFAS in poorly-gauged basins with satellite-based rainfall information.

2 Course Outline (Course Topics)

Week

1 : Introduction to Flood Hazard Modeling
2 : Fundamentals of Rainfall-Runoff Models
3 : Finite Difference Method for Differential Equations (1)
4 : Finite Difference Method for Differential Equations (2) (Fortran Exercise)
5 : Fundamentals of Flood Inundation Models
6 : Inundation Analysis (1) (Fortran Exercise)
7 : Inundation Analysis (2) (Fortran Exercise)
8 : Introduction of GFAS/IFAS
9 : Main Functions of GFAS, Applicability of the Satellite-Based Rainfall
10 : Correction Method of the Satellite-Based Rainfall, Validation of satellite-based rainfall
11 : Runoff analysis using IFAS (1) Data import, Model building
12 : Runoff analysis using IFAS (2) Parameter estimation
13 : Runoff analysis using IFAS (3) Validation of calculated discharge
14 : Runoff analysis using IFAS (4) Application to actual basins
15 : Runoff analysis using IFAS (5) Application to actual basins

3 Grading

Reports (100%)

4 Textbooks

4-1 Required

4-2 Others

Material made by the instructors