

Subject: Flood Hydraulics and Sediment Transport

Course number : DMP3810E

Instructor : Prof. Shoji FUKUOKA

Term / Time : Fall through Winter

1 Course Description

This course provides the basic knowledge necessary for planning and designing the structural measures for Integrated Flood Risk Management (IFRM). The course first describes the river administration and planning for application of IFRM. Especially the methodology of comprehensive river management will be emphasized that includes planning of flood hydraulics, flood control, and sediment movement to river channels. This will be followed by specific technologies of channel control and channel improvement.

2 Course Outline (Course Topics)

Week

1. Outlines of characteristics and management of Japanese rivers.
2. Occurrence of flood flows.
3. Propagation of hydrographs of water level and discharge in flood flows.
4. Flow resistance in rivers with compound channels.
5. Prediction method of flow resistance in compound channels and application to river course design.
6. Steady quasi-two dimensional analysis of flood flows in rivers with vegetations.
7. Unsteady quasi-two dimensional analysis of flood flows.
8. Relationship between dimensionless width, depth and discharge in rivers
- Learning from natural rivers
9. River cross-sections harmonizing flood control and river environment
10. Outline of sediment transport
11. 1-D bed deformation, computing model
12. 2-D bed deformation, sand waves and bars, meandering
13. River disaster due to channel movement
14. Flows in vegetated zone and stabilized bars
15. River restoration based on sediment transport

3 Grading

Reports (20%) Final examination (80%)

4 Textbooks

4-1 Required

4-2 Others