

Subject: Flood Hydraulics and Sediment Transport

Course number : DMP381E

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 and dam reservoirs. This will be followed by specific technologies of channel control and channel improvement.

2. Course Outline (Course Topics)

Week

1. Do alluvial rivers have a stable river width and depth- learning from natural rivers
2. To derive a relationship between stable dimensionless width, depth and discharge in natural rivers
3. How do we make a river cross-section harmonizing flood control and river environment
4. Prediction method of flow resistance in rivers with compound channels and application to river course design (1)
5. Prediction method of flow resistance in rivers with compound channels and application to river course design (2)
6. Steady quasi-two dimensional analysis of flood flows (1)
7. Steady quasi-two dimensional analysis of flood flows (2)
8. Unsteady quasi-two-dimensional analysis of flood flows (1)
9. Unsteady quasi-two-dimensional analysis of flood flows (2)
10. 1-D bed deformation, computing model
11. 2-D bed deformation, sand waves and bars, meandering
12. Vegetations, flows in vegetated zone
13. River restoration based on sediment transport and vegetation on stabilized bars
14. Re-meandering project for river restoration
15. Bank erosion and drift woods

3 Grading

Reports (20%) Final examination (80%)

4 Textbooks

4-1 Required

4-2 Others