

Course Name	Hydrology, Water Resources and River Engineering		
Semester, Year	2 学期 (秋ターム)	Number of Credits	2 credits
Course level	3000	Course Number	27085
Instructor(s) (Institution)	Norihiro IZUMI (大学院工学研究院) Tomohito YAMADA (大学院工学研究院) ADRIANO COUTINHO DE LIMA (大学院工学研究院)		
Course Objectives	In this class, we learn various problems concerning hydrosphere centering on rivers. Through rivers, we explore technologies for the coexistence of nature and human beings. Some of the most important issues in terms of engineering are flood control, water utilization, and river environments. Aiming to create safe, rich and beautiful hydrosphere environments, we obtain basic knowledge on the status quo of rivers in Japan and the world, the mechanisms of water circulation, rainfall and runoff, and the transport mechanisms by rivers of various substances including sediment, necessary for the prevention, protection, and mitigation of floods, and the protection and regeneration of river environments.		
Course Goals	We understand the mechanisms of water circulation, rainfall, and runoff, and learn the methods of stochastic hydrological analysis and runoff analysis. We understand the transport mechanisms of various substances by rivers, and learn how to calculate sediment transport, and predict riverbed evolution. In addition, we learn how to solve environmental problems related to rivers such as river flow in channels covered with vegetation.		
Course Schedule	1. Hydrology 1-1 What is hydrology? 1-2 Water on the earth 1-3 Hydrological water circulation 1-4 Precipitation in Japan and in the world 1-5 Rivers in Japan and in the world 1-6 Runoff and effective rainfall 1-7 Stochastic hydrological analysis 1-8 Runoff models 2. River engineering 2-1 History of flood control and water utilization 2-2 Sediment transport and river bed evolution 2-3 Threshold of sediment movement 2-4 Bedload and suspended load 2-5 River bed evolution 3. Environmental hydro-engineering 3-1 Transport mechanisms of rivers 3-2 River flow in channels covered with vegetation		
Homework	Problems and exercises related to the content studied in each class are imposed as an assignment almost every week. Students are required to solve them and submit as reports.		
Grading System	Looking at the results of your assignments, we conduct lectures according to the degree of your understanding. The distributions of grades are "A +" and "A" = 0 to 15%, "A-" and "B +" = 10-40%, "B" and "B-" = 10 to 40%, "C +" and "A" = 10 to 40% as a guideline.		
Textbooks / Reading List	教科書は用いない。毎回、各回の要点をまとめたレジュメを配布する。 水理公式集 土木学会 丸善 1999 河川工学 吉川秀夫 朝倉書店 2006		
Websites			
Website of Laboratory	http://earth-fe.eng.hokudai.ac.jp/lecture/RiverEngineering.html		
Additional Information	Handouts are delivered by instructors		