高等水文分析

Advanced Hydrologic Analysis

Course Information	
Course title	Advanced Hydrologic Analysis
Semester	114-2
Designated for	COLLEGE OF ENGINEERING GRADUATE INSTITUTE OF CIVIL ENGINEERING, HYDRAULIC ENGINEERING DIVISION
Instructor	TZU-YIN CHEN
Curriculum Number	CIE7033
Curriculum Identity Number	521EM2410
Class	
Credits	3.0
Full/Half Yr.	Half
Required/ Elective	Required
Time	Thursday 7,8,9(14:20~17:20)
Remarks	The upper limit of the number of students: 40.
Course introduction video	
Table of Core Capabilities and Curriculum Planning	Table of Core Capabilities and Curriculum Planning
Course Syllabus	
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Course Description	Hydrological systems are both complex and extremely heterogeneous in time and space. Stochastic hydrology is the statistical branch of hydrology that deals with the probabilistic modeling of those hydrological processes which have random components associated with them. Stochastic hydrology is mainly concerned with the assessment of uncertainty in model predictions. The use of probabilistic techniques to characterize hydrologic processes is a key element in the analysis of hydrologic problems. Such analyses are characterized by data collection, analysis and interpretation, simulation and forecasting. This course will introduce stochastic methods used in hydrology. The level of understanding should, upon

	completion of the course, be sufficient to understand and appreciate the important issues in the current literature on stochastic hydrology where statistical methods are used in prediction and interpretation of hydrologic processes. The course will involve readings from the stochastic hydrology literature and hands on computer analysis and simulation.
Course Objective	This course will stochastic approach to hydrology. We start with the basics: descriptive statistics followed by lectures on probability, random variables and random processes. After the basic concepts of the random processes, the lectures will deal with the following topics: regression, probability fitting, time-series analysis, geostatistics, forward stochastic modeling, optimal state prediction and data-assimilation. Students are expected to understand following topics after this course 1. Introduction 2. Probability theory and random variables 3. Statistics and Statistical Methods 4. Probability Distribution Functions 5. Regression: Linear regression, kernel regression, local regression, splines, neural networks. 6. Time series models of hydrologic processes. 7. Trend identification 8. Spatial Processes and Random Fields. 9. Geostatistics 10. Data Assimilation, Kalman Filter, Ensemble Kalman Filter.
Course Requirement	
Student Workload (Expected weekly study hours before and/or after class)	
Office Hours	
Designated reading	
References	Bras, R. L., & Rodriguez-Iturbe, I. (1993). Random functions and hydrology. Courier Corporation.1. Bedient, P.B., Huber, W.C., 2008. Hydrology and Floodplain Analysis. Chatfield, C. (2003). The analysis of time series: an introduction. Chapman and Hall/CRC. Haan, C. T. (1977). Statistical methods in hydrology. The Iowa State University Press. Hamilton, J. D. (1994). Time series analysis (Vol. 2, pp. 690-696). Princeton, NJ: Princeton university press.

	Pegram, G. G. S. (2009). Probabilistic Methods and Stochastic Hydrology. Hydraulic Structure, Equipment and Water Data Acquisition Systems-Volume I, 245. Salas, J. D. (1980). Applied modeling of hydrologic time series. Water Resources Publication.
Grading	1. NTU has not set an upper limit on the percentage of A+ grades. 2. NTU uses a letter grade system for assessment. The grade percentage ranges and the single-subject grade conversion table in the NATIONAL TAIWAN UNIVERSITY Regulations Governing Academic Grading are for reference only. Instructors may adjust the percentage ranges according to the grade definitions. For more information, see the Assessment for Learning Section.

Progress

Week	Date	Topic
No data		