

COURSE OUTLINE  
HYD 273  
INTRODUCTION TO GEOSTATISTICS  
2018

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 Office hours: Tues. and Ths. 10:30 to 12:00  
 Prerequisites: Mathematical Statistics  
 Textbook: Geostatistics for Natural Resources Evaluation, by Goovaerts

Course Grade: 30% Homework  
 35% Mid-term exam  
 35% Seminar presentation and lecture notes

Topic	Text Chapter (Approximate!)
Introduction	
Basic statistics (univariate and bivariate description)	1-2; p. 3-22
Spatial statistics	2; p. 22-57
Random variables and random function models; stationarity	3; p. 59-74
Modeling spatial variability (variograms, cross- variograms, covariance etc.)	4; p. 75-123
Kriging (point and block); other kriging 'flavors'	5; p. 125-184
Cokriging (accounting for secondary information)	6; p. 185-233
Dealing with local uncertainty; Indicator methods	7; p. 259-367
Dealing with spatial uncertainty: simulation methods	8; p. 369-436
Transition probability geostatistics (TPROGS)	

**The Plan:**

We will lecture for approximately the first 5 to 6 weeks, during which about four homework assignments will be due. Two of these assignments will involve use of the geostatistical computer package GS+. The only exam will occur in week 6 or 7.

The remainder of the quarter will have a seminar/workshop format wherein students research a geostatistics topic of interest to them and present the results near the end of the quarter. During this period, Dr. Fogg will offer special lectures and computer workshops on the use of TPROGS, a method for geostatistical simulation of categorical variables such as geologic units in the subsurface.

The project presentation will be in two parts, oral and written. The oral presentation will likely be a 20 minute talk followed by discussion. The written presentation will be the slides plus a bibliography and key points of the talk. The written materials should be sufficiently detailed and complete to be understandable years into the future.