空间分析与模型课程教学大纲

课程代码：74120590

课程中文名称：空间分析与模型

课程英文名称：Spatial Analysis and Modeling

学分：2.0　　周学时：2.0-0.0

面向对象：

预修要求：

一、课程介绍

（一）中文简介

本课程的目的在于向包括海洋信息科学与工程，海洋科学，资源环境或地理科学专业的研究生介绍空间分析的基本原理和方法及其主要模型。本课程依托于海洋学院的研究力量，面向海洋学院的相关专业，原理和方法适用于水体、陆地。通过课堂讲授和实践掌握空间统计的基本原理、方法和主要模型，在大气、近海、陆地的地学、环境科学中的应用。通过作业，报告和考试来综合评估掌握程度。

（二）英文简介

The theory and techniques of geostatistics have been around in mineral exploration and petroleum engineering for some fifty decades. In recent decades, soil scientists, hydrologists, ecologists, geographers, and environmental engineers have seen that the technology is for them. A key feature of resources or environmental information is that each observation relates to a particular location in the space and time domains. Knowledge of an attribute value, say a soil attribute or pollutant concentration in environment, is thus of little interest unless location and/or time of measurement are known and accounted for in the analysis. Geostatistics provides a set of statistical tools for incorporating spatial and temporal coordinates of observations in data processing. This course will introduce the main geostatistical theories and methods for description and modeling of spatial variability, and

interpolation of attributes at unsampled locations. Important topics such as sampling design or the incorporation of different types of information (continuous, categorical) in prediction will also be addressed.

<table>
<tr><td>教学目标</td><td colspan="4">培养学生坚实的数理基础、抽象逻辑思维能力、严谨踏实的工作作风、良好的科学态度和强悍的自学能力，为其他课程的学习和科学研究打下坚实基础。</td></tr>
<tr><td>参考文献</td><td colspan="4"></td></tr>
<tr><td rowspan="2">参考书目</td><td>书名</td><td>著者</td><td>出版社</td><td>出版年份</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="8">教学日历</td><td>周次</td><td colspan="3">教学内容（包括课堂讲授、实验、讨论、考试等）</td></tr>
<tr><td>1</td><td colspan="3">Exploratory Data Analysis , Univariate description (histogram, data transformation, contingency table), Bivariate description (scattergram, correlation)</td></tr>
<tr><td>2</td><td colspan="3">Spatial description (direct and cross semivariogram, connectivity function), The Random Function Model, Deterministic and probabilistic models, Random variable</td></tr>
<tr><td>3</td><td colspan="3">Random function, Multivariate random function Inference and Modeling, Sampling designs</td></tr>
<tr><td>4</td><td colspan="3">Correction for preferential sampling, Semivariogram inference and modeling</td></tr>
<tr><td>5</td><td colspan="3">Model of coregionalization, The practice of modeling Spatial Interpolation</td></tr>
<tr><td>6</td><td colspan="3">Thiessen polygons, inverse distance method</td></tr>
<tr><td>7</td><td colspan="3">Univariate k riging (simple, ordinary, with a trend), Change of support (block kriging)</td></tr>
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	8	Noise filtering and mapping of regional components, Incorporation of secondary information in prediction Cokriging