

Academic Year: 2019/2020		
Course: Geostatistics and Environment		
Coordinator: Nelson Mileu		
Teaching Staff: Nelson Mileu		
ECTS: 6	Weekly Hours: 3,0 h	Typology: Theoretical-practical
Contents		
<p>1. Introduction to Descriptive statistics and Spatial Statistics Descriptive statistics, Measuring Geographic Distributions, Standard Deviational Ellipse</p> <p>2. Introduction to geostatistical techniques 2.1 Analyzing and interpolating spatial data 2.2 Comparing different methods 2.3 Exploring data</p> <p>3. Deterministic methods 3.1 Voronoi Map 3.2 Inverse Distance Weighting (IDW) 3.3 Global Polynomial Interpolation 3.4 Local Polynomial Interpolation 3.5 Radial Basis Functions (RBF)</p> <p>4. Geostatistical methods 4.1 Regionalized variable theory (RVT) 4.2 Kriging 4.3 Producing other surfaces, performing cross validation and validation</p>		
Objectives and skills		
<p>Objectives:</p> <ul style="list-style-type: none"> - describe spatial statistical sampling and implementing a data analysis process; - present different methodologies for the creation of geostatistical surfaces; - use of spatial interpolation methods and tools for data representation and data mining; - use of interpolation functions and achieve results consistent with the objectives of work; - compare surfaces prepared under different methodologies and different criteria. <p>Skills:</p> <ul style="list-style-type: none"> - understand the process of data analysis and capacity for critical analysis of results; - understand the advantages and disadvantages of different interpolation methods; - ability to create interpolation surfaces with different methods; - ability to validate the estimated models. 		
References		
<p>Fotheringham, A. Stewart et al (2000) – Quantitative Geography. Perspectives on Spatial Data Analysis. SAGE Publications, London.</p> <p>Hengl T (2009) A Practical Guide to Geostatistical Mapping. Univ. Amsterdam.</p> <p>Johnston, Kevin et al (2001) Using ArcGIS Geostatistical Analyst. ESRI, Redlands.</p> <p>Kitchin R, Tate N (2000) Conducting Research in Human Geography, Pearson Ed. Lmd, Essex.</p> <p>Li, J.; Heap, A.D.(2008) - A Review of Spatial Interpolation Methods for Environmental Scientists. Geoscience Australia, Record 2008/23, 137 pp.</p> <p>McKillup , Steve e Dyar , Melinda (2010) - Geostatistics Explained, An Introductory Guide for Earth Scientists, Cambridge University Press, New York.</p> <p>Soares A (2006) Geoestatística para as Ciências da Terra e do Ambiente. IST, Lisboa.</p> <p>Sousa A J, Muge F (1990) Elementos de Geoestatística. LMPM, IST. 63p.</p>		
Knowledge evaluation methods and their partial grades		
1 individual test (55%). 1 practical group work, with development of a poster (45%).		