

<b>Academic Year: 2019/2020</b>		
<b>Course: Hazard, Vulnerability and Risk in Territory</b>		
<b>Coordinator: Eusébio Reis</b>		
<b>Teaching Staff: Eusébio Reis; Sérgio Oliveira</b>		
<b>ECTS: 6</b>	<b>Weekly Hours: 2,5 h</b>	<b>Typology: theoretical-practical</b>
<b>Contents</b>		
<p>1. <b>Conceptual Model of Risk:</b> terminology and integration of concepts; Risk analysis, Risk assessment and Risk management.</p> <p>2. <b>Risks and Spatial Planning:</b> extension, impact and causes of natural disasters; Natural Disaster databases; hydro-geomorphologic disasters in Portugal (DISASTER database).</p> <p>3. <b>Geomorphological hazards:</b> landslide susceptibility and hazard assessment (direct and indirect methods); validation of predictive models; probabilistic integration of susceptibility with triggering scenarios.</p> <p>4. <b>Soil erosion by water:</b> the role of precipitation on soil erosion; erosion processes and forms; factors influencing erosion; models for assessing soil erosion.</p> <p>5. <b>River flooding susceptibility and hazard:</b> types of floods; factors influencing the flood occurrence; hydrologic and hydraulic models and flood susceptibility assessment.</p> <p>6. <b>Vulnerability to aquifers contamination:</b> factors responsible for groundwater contamination; methodologies for aquifers contamination vulnerability assessment.</p> <p>7. <b>Susceptibility and hazard of forest fires:</b> causes and factors influencing forest fires; forest fires in mainland Portugal; forest fire susceptibility and hazard mapping.</p> <p>8. <b>Exposure and Vulnerability:</b> conceptual models and evaluation methods; indicators, scales of analysis and validation.</p> <p>9. <b>Risk Analysis:</b> qualitative and quantitative Risk Analysis.</p>		
<b>Objectives and skills</b>		
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>- To understand disaster risk in the context of public policy, namely on joint policies of the Environment, Spatial Planning and Civil Protection.</li> <li>- To understand the methodological procedures to evaluate susceptibility and hazard at the regional scale for the following dangerous processes: landslides, soil erosion, floods, pollution of aquifers and forest fires.</li> </ul> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>- Capability to make research and to develop methodological thought within the risk science.</li> <li>- Capability to collect, to manipulate, to model and to map data at the regional scale in the risk conceptual framework.</li> <li>- Capability to select appropriate methods and techniques to study particular risk cases.</li> <li>- Capability to produce risk maps, and to disseminate the obtained results.</li> </ul>		
<b>References</b>		
<p>Glade, T; Anderson, M; Crozier, M (2005) <i>Landslide Hazard and Risk</i>. John Wiley &amp; Sons, London.</p> <p>Guzzetti, F (2005) <i>Landslide Hazard and Risk Assessment. Concepts, Methods and Tools for the Detection and Mapping of Landslides, for Landslide Susceptibility Zonation and Hazard Assessment, and for Landslide Risk Evaluation</i>. PhD Thesis, Bonn.</p> <p>International Organization for Standardization (2009) <i>Risk management - Principles and guidelines on implementation</i>. INTERNATIONAL STANDARD ISO/DIS 31000.</p> <p>Julião, R P; Nery, F; Ribeiro, J L; Castelo Branco, M; Zêzere, J L (2009). <i>Guia metodológico para a produção de cartografia municipal de risco e para a criação de Sistemas de Informação Geográfica de base municipal</i>. ANPC, DGOTDU, IGP.</p> <p>Rougier, J; Sparks, S; Hill, L J (2013) <i>Risk and uncertainty assessment for natural hazards</i>, Cambridge.</p>		

Thywissen, K (2006). Components of Risk. A comparative Glossary. *SOURCE, Studies of the University: Research, Counsel, Education, Publication Series of UNU-EHS*, nº2, United Nations University.

**Knowledge evaluation methods and their partial grades**

Individual test, to solve outside classroom (55 %).

Theoretical group work (45 %).