TITOLO DEL CORSO GEOCHEMICAL SITE CHARACTERIZATION AND RISK ANALYSIS			
Settore Scientifico - Disciplinare: GEO/08		**CFU: 6** (4 LF + 2 LAB)	**Ore: 56**
Ore di studio per attività:	**Lezioni frontali:** 2	**Laboratorio:** 1	**Attività di campo:** 0
Tipologia di attività formativa: caratterizzante			

SYLLABUS

Prerequisiti: Geochemistry, English.

Lezioni frontali	
numero di ore 4	Argomento: Environmental legislation relating to contaminated sites and to site-specific risk analysis.
numero di ore 12	Argomento: Main sources of contaminants; sampling points selection; pollutants selection; survey methods (Boreholes and piezometers); soil and groundwater sampling methods; soil and waste sample formation; analytical methods (Chemical analysis of soils; Chemical analysis of water); control activity and quality controls.
numero di ore 16	Argomento: Minimum requirements for risk assessment onset; basic concepts and principles; definition of the Site Conceptual Model (SMC); components of the risk analysis (Index contaminants, sources, routes and exposure modalities, receptors or contamination targets); assessment and risk calculation procedures; calculation of remediation objectives; validation of results.
Laboratorio	
numero di ore 4	Attività: **Commercial and Open Source GIS software** for geochemical and environmental risk assessment.
numero di ore 20	Attività: Construction of a **spreadsheet** for the evaluation of preliminary environmental health risk. Examples of application of a health-environmental and ecological risk analysis. Practical exercises on **Risknet software**.

Risultati di apprendimento attesi

Knowledge and understanding:
The student must demonstrate to know how to interpret an environmental characterization plan of a potentially contaminated site developed according to the international and national guidelines; he also needs to know of the fundamental principles of the geochemical and health environmental risk analysis of the contaminated sites. This knowledge, accompanied by the theoretical and practical skills acquired in other courses, will allow the student to approach the topic with a comprehensive vision of all the factors that can significantly influence the success of a geochemical characterization program and the assessment of the risks associated with a contaminated site.

Applying knowledge and understanding:
Students must demonstrate to be able to draw up a site-specific environmental characterization plan and to be able to set up and carry out a health risk analysis using some

specific tools and softwares.
Making judgements: Students must be able to independently assess the specific problems of a potentially contaminated site and to choose the best practice in terms of cost-benefits to reach the resolution of problems. They must demonstrate autonomy of judgment in indicating the operational path to be followed during planning and risk assessment.
Communication: Students must demonstrate to be able to explain to people (even if they do not possess a specific preparation on the subject) the basics of risk assessment and of environmental survey planning. They must, however, be able to present the topics covered by the course by correctly using technical language and to explain the choices made within the framework of a potential process of risk assessment.
Learning skills: Students must demonstrate that they acquired the necessary learning tools to be up to date and to expand their knowledge by autonomously studying on books and scientific articles.
Modalità di verifica dell'apprendimento
Prove intercorso: At the end of the frontal lessons (Lectures), students will have to prepare a **multimedia presentation** (on a topic chosen by the teacher) based on the collection of relevant contents from literature sources and official documents.
Esame finale: The final examination will consist of an oral exam on the topics covered by the lectures and practice.