UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Introduction To Volcanology

2425-3-E3401Q058

Aims

The main goal of "*Introduction to volcanology*" is to provide students a clear knowledge of geological processes associated to the formation, evolution, and the operating principles of a volcanic system, starting from magma ascent and transport to magma delivery at the Earth's surface via volcanic eruptions. In addition, the goal of this course is to provide students the tools to decipher the volcanic history through the analysis of volcano-stratigraphic sequences mainly characterized by fall and flow deposits based on a field trip at Campi Flegrei, Mt. Somma-Vesivius, and Procida (Southern Italy).

Contents

Introduction to Volcanology course includes a variety of topics starting with magma ascent and transport and its connection to the global distribution of volcanoes on the Earth's surface. After this course, students will be able to know the shape and depths of magmatic pools associated to volcanic systems, and the associated eruption styles and landforms. During Introduction to Volcanology students will develop the knowledge to understand volcanic processes driving the deposition of pyroclastic products via falls and flows. The course will give focus to the interpretation of these processes based on the deposits analysis at the outcrops. In addition, the course will focus on the knowledge and evolution of magmatic volatiles (e.g., H2O, CO2, and S) associated to volcanic system aiming to build basic knowledge about implications that these volatiles have relative to the explosivity of eruptions and the climate forcing.

Detailed program

Main topics

1-Mith and legends of volcanoes, and history of volcanology
2-Voltiles and implications about physical properties of magmas
3- Depths and shapes of magmatic chambers
4- Ascent rates and stagnation of magmas
5- Magma fragmentation processes and styles of eruptions.
6- Global distribution of volcanoes
7- Volcanic landform and their eruptions
8- Eruptive column
9- Fall deposits processes
10- Flow deposits processes
11- Volcanic hazards
12- Climate forcing by volcanic eruptions
13- Volcanic history of Campi Flegrei and Vesuvius
14- Volcanic history of Tenerife Island (Canarie)
15- Vulcanic geo-resources
16- Extraterrestrial volcanoes

Prerequisites

Students must have obtained credits of the following courses: Sicurezza sul Terreno, Matematica, Fisica, Chimica e Mineralogia.

Teaching form

-4 CFU lecture (32 two-hour lectures, in person, Delivered Didactics followed by interectvie teaching
-2 CFU field trip (Campus Abroad; 24 hours spread in four days; interactvie teaching).

Textbook and teaching resource

In Italian:
Cortini e Scandone Introduzione alla Vulcanologia Liguori pp. 212
Roberto Scandone & Lisetta Giacomelli (1998) Vulcanologia. Liguori Editore, Napoli, pp. 642
I vulcani il fuoco della Terra (1993) Universale Electa/Gallimard pp.192
In English:
P.Francis & Oppenheimer Volcanoes (2005) Oxford University press pp 443
Haraldur Sigurdsson (ed.) (2015) Encyclopedia of Volcanoes. Academic Press, London, pp. 1417
H. Schmincke, (2014). Volcanism, Springer
Scientific articles about actual in course eruption may be assigned as reading for discussion in class.

Semester

Spring Semester, 3rd year of Bachelor in Scienze e Tecnologie Geologiche

Assessment method

Evaluation of students will be based on an oral exam (50% of the total grade), based on a field essay associated to the field trip (25% of the total grade), and based on a group presentation relative to a volcanic system.
During the oral exam, the student will be asked three questions to test the knowledge of the topics and volcanic processes covered during the course program. With the oral exam, the student's ability to link different topics treated during the course, to expose concepts, and to use a proper jargon will be tested. Midterm exams are not included in this course.

Office hours

Contact the instructor for an appointment by email at the following email-address: rosario.esposito@unimib.it room 1034 U4

Sustainable Development Goals

QUALITY EDUCATION | CLIMATE ACTION