UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Introduction To Volcanology

2627-3-E3401Q058

Aims

The objectives of this course are described bsed on the Dublin Descriptors
Knowledge and understanding:
The course of *Introduction to volcanology* mainly intends to provide the student with the knowledge to learn the geological processes that concern the formation, evolution, functioning of a volcanic system, starting from the ascent and transport of deep magmas to their manifestation on the surface through eruptive processes.
Applied knowledge and understanding:
The objective of this course is also to provide students with the tools to read the eruptive history of a volcano through the study of outcrop volcano-stratigraphic sequences with alternating fall and pyroclastic flow deposits, through a field trip on the Campania volcanoes (Campi Flegrei, Mt. Somma-Vesuvius and Procida).
Autonomy of judgment:
The Introduction to Volcanology course aims for the student to improve the ability to critically evaluate texts and data that will be discussed during the lessons regarding active volcanic systems
Communication skills:
To a small extent, during this course we will try to advance communication skills through a final group presentation related to a volcano that the students will select from the first lessons
Learning ability:
Finally, one of the goals of this course is to provide the student with basic information on volcanic systems so that they can continue to learn concepts related to this subject but in more specialized courses of the three-year degrees available both at our university and in others

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