UNIVERSITÀ DI PAVIA

Anno Accademico 2020/2021

VOLCANOLOGY

Enrollment year	2018/2019
Academic year	2020/2021
Regulations	DM270
Academic discipline	GEO/08 (GEOCHEMISTRY AND VOLCANOLOGY)
Department	DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES
Course	GEOLOGICAL SCIENCES
Curriculum	PERCORSO COMUNE
Year of study	3°
Period	2nd semester (01/03/2021 - 18/06/2021)
ECTS	6
Lesson hours	60 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	SANFILIPPO ALESSIO (titolare) - 3 ECTS SCHIAVI FEDERICA - 3 ECTS
Prerequisites	The course does not require prerequisites. However, we recommend knowledge of the basic concepts of geology and geochemistry.
Learning outcomes	The course is aimed at introducing the students to a variety of volcanology topics, namely the relationships between volcanism, tectonic and geodynamics, the main volcanic structures and the magmatic products. We will examine the main chemical and physical factors controlling the volcanic activity, also introducing the main monitoring techniques. The course will also provide a general picture of the volcanic activity in Italy, with special emphasis to volcanic hazard. The class activity is combined with field excursions.
Course contents	Volcanism and tectonics. Volcanic structures and geodinamic distribution. Genesis and evolution of magmas; compositional variability: major and trace elements; magmatic series; geochemical signatures:

	trace elements and isotope compositions as markers of mantle sources and evolutionary processes; glass inclusions. Chemical and physical properties of magmas; temperature of eruptions; magma structure; role of volatiles and mineral crystallization on viscosity; magma rheology: density and viscosity. Volatiles; volatiles species in magmas; H2O and CO2 solubility; fluid inclusions in minerals and fluids in glass inclusions; determination of volatiles in magmas and other volcanic products; the role of volatiles in magma physics and magma chamber dynamics. Magma uprising; degassing; flux regimes in gas-bearing magmas; volcanic explosivity and fragmentation. Volcanic eruptions: time, scale, classification; tephra versus lava production; timing and paroxysm of eruptions; energy, intensity and destructive power; phreatic and phreato-magmatic eruptions. Products of volcanic activity: lavas and pyroclasts. Volcanic hazard and risk; risk maps; risk related to gas; aerosols and climate effects; volcanic monitoring: geological, geophysical and geochemical methods; risk menagement. Volcanism as a resource; geothermics; soils; volcanic stones in industry; volcanoes and tourism; volcanoes and archaeology. Regional volcanism: main volcanic regions in Italy, Europe and on Earth. The course will include field excursions to the active volcanoes of the Southern Tyrrhenian region: Aeolian Islands (Stromboli, Vulcano), Mt Etna.
Teaching methods	The course consists of lectures, exercise sessions and field trips.
Reccomended or required readings	Lisetta Giacomelli & Roberto Scandone (2002) Vulcani e eruzioni. Con CD-ROM. Pitagora Editrice, pp. 288. Lisetta Giacomelli & Roberto Scandone (2007) Vulcani d'Italia. Liguori Editore. pp. 490.
Assessment methods	The evaluation is carried out through a final oral exam. Both the topics covered in the lectures and those discussed in the field trips are the subject of the examination.
Further information	-
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile