

## COURSE SYLLABUS

### Geology of Volcanic Areas

2526-1-F7402Q035

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#### Aims

Provide knowledge that allows you to deal with the lithostratigraphic and geological-structural survey of volcanic successions, with reference also to the reconstruction of the evolution of a volcanic edifice from a geological and geomorphological point of view.

#### Contents

The general contents allow the student to prepare himself to be able to face a complete survey, from a geological point of view, of the volcanic environment. The studies therefore include aspects related to the lithological, stratigraphic, geomorphological and structural evolution of volcanic edifices.

#### Detailed program

The course consists of a series of indoor lessons, equal to 4 CFU, plus a field trip in a volcanic environment in Italy, equal to 2 CFU.

Detailed indoor lesson program:

1. Introduction: Volcanoes and geodynamics
  - 1.1 Volcanism associated with divergent margins
  - 1.2 Volcanism associated with converging margins
  - 1.3 Volcanism associated with transform margins
  - 1.4 Intraplate volcanism
  
2. Type and products of eruptions

- 2.1 Effusive, explosive, phreato-magmatic, phreatic eruptions
- 2.3. Products of effusive eruptions
- 2.4. Products of explosive eruptions
- 3. Gravitative products
  - 3.1 Volcaniclastic deposits
  - 3.2 Lahars
  - 3.3 Debris avalanche
- 4. The volcanic edifices
  - 4.1 Basaltic plateaus
  - 4.2 Monogenic volcanoes
  - 4.3 Polygenic volcanoes
  - 4.4 Calderas
  - 4.5 Pseudocraters, Hornitos, Scoria ramparts
- 5. The methods of cartography of volcanic deposits
  - 5.1 Field survey
    - 5.1.1 Survey of lithostratigraphic units
    - 5.1.2 The Unconformity Bounded Stratigraphic Units
    - 5.1.3 The lithosomes
  - 5.2 The contribution of photointerpretation
- 6. The sub-volcanic bodies
  - 6.1 Dykes
  - 6.2 Inclined sheets
  - 6.3 Sill
  - 6.4 neck, laccoliths and lopoliths
- 7. Examples of geology of Quaternary volcanism in Italy
  - 7.1 The Phlegraean Fields
  - 7.2 The Somma-Vesuvius
  - 7.3 Ischia
  - 7.4 The Aeolian Islands
    - 7.4.1 Aliduci-Filicudi-Lipari-Panarea
    - 7.4.2 Stromboli
    - 7.4.3 Volcano
  - 7.5 M. Etna
  - 7.6 Pantelleria
  - 7.7 Alban Hills
  - 7.8 The underwater volcanoes
- 8. Hints of hazard / volcanic risk
  - 8.1 Extinct, Quiescent, Active volcanoes
  - 8.2 The Volcanic Explosive Index
  - 8.3 Volcanic risk maps

## Prerequisites

Basic knowledge of geological survey, geomorphology and structural geology. Once activated, have followed the Introduction to Volcanology course. The student must have completed the course of field security.

## **Teaching form**

The course comprises a total of 6 ECTS credits, structured into lecture-based teaching and field activities.

Lectures: 21 hours (3 ECTS), delivered in in-person expository mode (DE).

Field activities: 36 hours (3 ECTS), carried out in in-person interactive mode (DI) and organised over consecutive days.

## **Textbook and teaching resource**

PowerPoint slides of lessons and readings suggested at lesson.

## **Semester**

Second semester

## **Assessment method**

Weighted average of the marks obtained for the part of the lessons and for the part of the field trip.

## **Office hours**

By appointment.

## **Sustainable Development Goals**

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