



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze della Terra e del Mare		
ACADEMIC YEAR	2021/2022		
BACHELOR'S DEGREE (BSC)	NATURAL AND ENVIRONMENTAL SCIENCE		
INTEGRATED COURSE	MINERALOGY AND PETROGRAPHY - INTEGRATED COURSE		
CODE	19860		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	GEO/06, GEO/07		
HEAD PROFESSOR(S)	SCIASCIA LUCIANA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)	SCIASCIA LUCIANA	Professore Associato	Univ. di PALERMO
	SCOPELLITI GIOVANNA	Professore Associato	Univ. di PALERMO
CREDITS	12		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	SCIASCIA LUCIANA		
	Monday	10:00 13:00	stanza del docente
	Thursday	10:00 13:00	stanza del docente
	SCOPELLITI GIOVANNA		
	Tuesday	15:00 16:00	Via Archirafi 36, Il piano, stanza II-4

DOCENTE: Prof.ssa LUCIANA SCIASCIA

PREREQUISITES	Knowledge and skill of the contents of the courses of Mathematics, Chemistry.
LEARNING OUTCOMES	Mineralogy module: - Acquisition of basic knowledge of mineralogy and understanding of the basic principles determining the physico-chemical and structural properties of minerals, their classification, and the main methods of identification and characterization (XRD, XRF and optical crystallography). - Ability to identify and classify minerals based on criteria including the structural and chemical features of minerals and to recognize the appropriate analytical technique for their characterization. - Ability to autonomously elaborate the acquired mineralogical knowledge and evaluate the implications in the geo-petrological field and materials science. - Ability to use the appropriate terminology and symbols to communicate the basic notions of mineralogy. - Ability to deepen and update the knowledge in the field of mineralogy, autonomously drawing from materials / texts and scientific articles. Petrography module: - Acquisition of the needed tools to identify a rock, including the use of the polarized light microscope. Acquisition of basic knowledge needed to the rocks classification. Ability in the use of specific petrographic language. - Ability in the reconstruction of the genetic environment of a rock from its macro and micro features. - Ability in the evaluation of the results obtained from a petrographic study in terms of implications related to the mineral constituents of the rock and its history. - Ability to explain the features of a rock and its genetic environment also to non-experts. - Ability to connect in a overview the information obtained by the petrographic features of a rock with the natural processes which it may have underwent.
ASSESSMENT METHODS	The grades for subject exams are measured in thirtieths (0-30 scale). Mineralogy module: Verification of learning will be carried out through an oral test focused on all topics presented during lessons. Minimum requirements for passing the test are the identification under the polarized light microscope of the most common minerals and the ability to critically discuss topics of the course through a minimum number of 4 open questions, aimed at ascertaining the acquisition of the fundamental principles of mineralogical optics, crystallography, systematic mineralogy, and mineralogical analytic techniques. The ability to present arguments with appropriate scientific language, and to correlate the various topics with be also evaluated. Petrography module Oral exam concerning: 1) identification under the polarized light microscope of 1 rock thin section: optical features of minerals, classification, petrogenesis; 2) discussion on the topics developed during the class by a minimum number of 3 open questions (related to igneous, sedimentary and metamorphic rocks, respectively) aimed to verify: (i) the correct use of scientific-technical language; (ii) the ability to develop an autonomous and critical thinking; (iii) the conceptual connection among different studied topics. The minimum requirements for passing the exam are: (i) identification of the rock thin section and its geological-petrographic framework; (ii) sufficient knowledge level of the three petrogenetic sections and ability of linkages among the topics.
TEACHING METHODS	Theory classroom-lessons with power-point projections and morphological crystallography and mineralogical optics practice, together with thin sections analysis

MODULE PETROGRAPHY

Prof.ssa GIOVANNA SCOPELLITI

SUGGESTED BIBLIOGRAPHY

Morbidelli, L. - Le rocce e i loro costituenti. Bardi Editore.

Peccerillo, A., Perugini, D. - Introduzione alla petrografia ottica. Con CD-ROM. Morlacchi Editore.

AMBIT	50175-Doiscipline di scienze della Terra
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INDIVIDUAL STUDY (Hrs)	98
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COURSE ACTIVITY (Hrs)	52
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EDUCATIONAL OBJECTIVES OF THE MODULE

The aim of the course is to give to the student the instruments to describe and classify a rock to individuate the genetic environment allow him to evaluate the implications of its history. To this purpose will be illustrated the main methods to study rocks in laboratory and will be defined the most important igneous, sedimentary and metamorphic processes responsible of the rock formation.

SYLLABUS

Hrs	Frontal teaching
2	Course presentation: purposes and methods.
2	The Earth: introductory concepts.
2	Reviews on the optical features of the main minerals useful for the rock classification.
6	The extrusive, intrusive and hypabyssal rocks: structures and texture, classification and petrogenesis.
8	Study of the main thermodynamic diagrams for the magmatic systems modelling.
4	The igneous rocks in the different geodynamic environments.
8	The sedimentary rocks: structures and texture, sedimentary environment and petrogenesis.
6	The metamorphic rocks: structures and texture, kinds of metamorphism.
2	Applied petrography overview: examples of the use of rocks in industry and environmental implications.

Hrs	Practice
2	Identification under the polarized light microscopy of the main intrusive igneous rocks.
2	Identification under the polarized light microscopy of the main extrusive igneous rocks.
2	Identification under the polarized light microscopy of the main clastic sedimentary rocks.
2	Identification under the polarized light microscopy of the main chemical, organic and organogenic sedimentary rocks.
2	Identification under the polarized light microscopy of the main metamorphic rocks from a silica and clay-rich protolith.
2	Identification under the polarized light microscopy of the main metamorphic rocks from a basic or carbonate protolith.

MODULE MINERALOGY

Prof.ssa LUCIANA SCIASCIA

SUGGESTED BIBLIOGRAPHY

Klein C. (2004). "Mineralogia", Ed. Zanichelli, Bologna.
 Peccerillo, Perugini (2004) - "Introduzione alla microscopia ottica", Morlacchi editore
 Putnis, A. (1992) "An Introduction to Mineral Sciences", Cambridge University Press

AMBIT	50175-Doiscipline di scienze della Terra
INDIVIDUAL STUDY (Hrs)	94
COURSE ACTIVITY (Hrs)	56

EDUCATIONAL OBJECTIVES OF THE MODULE

The aim of the module is to provide the theoretical and notional background necessary in acquiring a complete knowledge of the fundamentals of Mineralogy, ensuring that the student is able to transfer the basic concepts to other disciplines in the field of Natural Sciences. In particular, the basic preparation provides for the understanding of the concept of crystallographic symmetry, elementary thermodynamics (coupled with crystal chemistry, that explain the genesis and evolution of the mineralogical assemblies together with the structural stability of the mineral itself), chemical characterization of the mineral (analytical techniques and related basic principles) and physical properties. The course ends with the study of Systematic Mineralogy, which represents a synthesis of the basic concepts studied throughout the course, paying particular attention to the rock-forming minerals.

SYLLABUS

Hrs	Frontal teaching
1	Objectives of the Mineralogy in the natural and environmental sciences, and discussion on the disciplines in the Mineralogy framework.
6	The crystallographic symmetry and its role in the solid-state study
6	Fundamentals of crystal-chemistry
6	Elementary Thermodynamics - polymorphism
1	Crystalphysics : scalar and vectorial properties. Hardness, color, luster , cleavage , density, piezoelectricity, magnetism , thermal expansion and compressibility.
1	Mineralogical Systematics: criteria for mineral classification
3	Systematics: native elements, halides
5	Systematics: Oxydes and hydroxides
3	Systematics: Sulphides, carbonates, sulphates, phosphates
8	Classification and systematics of silicates, clay minerals and zeolites
Hrs	Workshops
6	Use of the microscope
10	Analysis of thin sections