



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Fisica e Chimica - Emilio Segrè		
ACADEMIC YEAR	2016/2017		
MASTER'S DEGREE (MSC)	CHEMISTRY		
INTEGRATED COURSE	INORGANIC AND MATERIALS SYNTHESIS		
CODE	16495		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	CHIM/03		
HEAD PROFESSOR(S)	BARONE GIAMPAOLO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	BARONE GIAMPAOLO	Professore Ordinario	Univ. di PALERMO
	SCOPELLITI MICHELANGELO	Ricercatore	Univ. di PALERMO
CREDITS	6		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>BARONE GIAMPAOLO Tuesday 15:00 17:00 Sede del Consorzio Universitario, corso Vittorio Emanuele, 92, 93100 Caltanissetta Wednesday 15:00 17:00 Studio del docente, viale delle Scienze, Edificio 17, 90128 Palermo</p> <p>SCOPELLITI MICHELANGELO Wednesday 14:00 17:00 Studio del docente - Edificio 17</p>		

DOCENTE: Prof. GIAMPAOLO BARONE

PREREQUISITES	Basic knowledge of Inorganic Chemistry
LEARNING OUTCOMES	<p>Knowledge and understanding: independent judgment; ability to critical assess the implications related to simple problems in the field of inorganic chemistry. Ability to perform a critical analysis of the experimental data obtained in laboratory experiments.</p> <p>Communication: being able to explain in a simple way the results of laboratory activities.</p> <p>Lifelong learning skills: to be able, on the basis of the skills acquired during the course, to interpret the experimental results obtained in the laboratory and contextualize them in comparison with similar results reported in the scientific literature.</p>
ASSESSMENT METHODS	The final examination consists of an oral interview, in which the topics of the course are discussed, starting from the presentation of a detailed description of some laboratory experiments.
TEACHING METHODS	Teaching takes place in the first half of the second year of the Master degree course in Chemistry and consists of lectures and of laboratory experiences. Basic Inorganic Chemistry concepts are recalled in the lectures, that underlie the experiences to deal with in the laboratory. The latter are designed to allow students to do independent experience of synthesis and characterization of inorganic compounds, making use also of scientific publications, and concluded with detailed written reports. The laboratory experiments and the related written reports are carried out in groups of a few (two to four) students.

MODULE
INORGANIC SYNTHESIS WITH LABORATORY

Prof. GIAMPAOLO BARONE

SUGGESTED BIBLIOGRAPHY

Z. Szafran, R.M. Pike, M.M. Singh: "Microscale Inorganic Chemistry: A Comprehensive Laboratory Experience", Wiley, 1991
J.D. Woollins (Ed.): Inorganic Experiments, 3rd Ed., Wiley, 2009

AMBIT	20975-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	37
COURSE ACTIVITY (Hrs)	38

EDUCATIONAL OBJECTIVES OF THE MODULE

The aim of the course is the application of basic and advanced concepts of inorganic chemistry of coordination compounds. In particular, emphasis will be given to the properties, synthesis, characterization and reactivity of metal complexes.

The course includes laboratory experiences, designed to provide new synthesis techniques of inorganic compounds. Aim of the experiences is the development of manual and intellectual skills for their preparation and characterization.

SYLLABUS

Hrs	Frontal teaching
4	Theories concerning the laboratory experiences.
4	Explanations on the use of the equipment to be used during the laboratory experiences.
Hrs	Workshops
8	Synthesis of transition metals amino-complexes.
8	Synthesis and characterization of organometallic compounds.
6	Interaction of metal ions with biological molecules.
8	Synthesis of catalytic precursors.

MODULE
MATERIALS SYNTHESIS WITH LABORATORY

Prof. MICHELANGELO SCOPELLITI

SUGGESTED BIBLIOGRAPHY

J. N. Lalena, D. A. Cleary, E. E. Carpenter, N. F. Dean. Inorganic Materials Synthesis and Fabrication. Wiley.
U. Schubert, N. Hüsing. Synthesis of Inorganic Materials. Wiley.

AMBIT	20975-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	37
COURSE ACTIVITY (Hrs)	38

EDUCATIONAL OBJECTIVES OF THE MODULE

This course deals with basic and advanced principles and applications of synthesis and fabrication techniques of inorganic materials; time will be devoted to some characterization method of such materials.

Discussed topics will be used and applied in specific laboratory experiences.

SYLLABUS

Hrs	Frontal teaching
5	Development of inorganic materials synthesis and fabrication. Main synthesis methods: crystallization, template synthesis, ceramic method, microwave synthesis, mechanical alloying, combustion methods, nanomaterials fabrication, sol-gel methods
3	Laboratory tools and instruments description. Spectroscopical methods.
Hrs	Workshops
6	Strontium ferrates and doped strontium ferrate synthesis via combustion method
4	Metal nanoparticles preparation
6	Spinel preparation via ceramic method
4	Xerogel preparation
4	Magnetite nanoparticle ferrofluid preparation
6	Selected characterizations of prepared materials