UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Culture e società
ACADEMIC YEAR	2022/2023
MASTER'S DEGREE (MSC)	ARCHAEOLOGY
SUBJECT	APPLIED CHEMISTRY FOR THE CULTURAL HERITAGE
TYPE OF EDUCATIONAL ACTIVITY	C
AMBIT	20871-Attività formative affini o integrative
CODE	15119
SCIENTIFIC SECTOR(S)	CHIM/02
HEAD PROFESSOR(S)	SALADINO MARIA LUISA Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	120
COURSE ACTIVITY (Hrs)	30
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**SALADINO MARIA LUISA** Monday 14:00 16:00 Dipartimento STEBICEF, Edificio 17, piano I Wednesday 14:00 16:00 Dipartimento STEBICEF, Edificio 17, piano I Thursday 14:00 16:00 Dipartimento STEBICEF, Edificio 17, piano I

DOCENTE: Prof.ssa MARIA LUISA SALADINO

PREREQUISITES	The preliminary knowledge are: fundamental of chemistry and physics.
LEARNING OUTCOMES	Knowledge and understanding The course objective is to provide the basic concepts to define the composition and chemical characteristics of the materials pertaining to the cultural heritage; and it defines the physical principles that govern the phenomena of interaction between radiation and matter in order to strengthen their capacity to understand the scientific language related to physical chemical techniques non-destructive and micro-invasive. Students must acquire the tools for the design and the preparation of a research in the field of cultural heritage, from the sampling operations to the elaboration and interpretation of the results and, if necessary, propose solutions and ideas for the characterization of materials. Students will also acquire the tools to critically evaluate the need to use advanced analytical methods for the study of materials. Applying knowledge and understanding Ability to define: the basic concepts necessary to understand the phenomena at the base of analytical techniques. Ability to apply the knowledge, the ability of understanding and skills related to the use of chemical and physical non-destructive and micro-invasive techniques for the characterization of materials of interest in cultural heritage, placed in a wider and interdisciplinary context. Making judgments Independent evaluation of the application difficulties and the benefits arising from the use of investigative techniques studied. Demonstrate that they have the ability to integrate knowledge and handle complexity, and to formulate judgments based on limited and incomplete information. Communication skills Being able to explain the basic concepts of the chemistry of Cultural Heritage, integrating them with the concept of interaction with the environment. Ability to communicate in a clear and unambiguous, even to non-experts interlocutors, their findings and knowledge. Learning ability Being able to apply the concepts taught in real case studies and explore topics through specific scientific articles of the matter.
ASSESSMENT METHODS	The exam consists of the evaluation of a report and of an interview to ascertain the possession of skills and subject knowledge provided by the course. The report must clearly illustrate a problem concerning the archaeometric diagnosis by defining the methodology used and the awaited results. The candidate will have to answer at least two questions posed orally on all parts of the program. The reports are intended to verify the processing capacity: 1) by illustrating the application of the subject content; 2) by demonstrating that they have the ability to integrate knowledge and handle complexity and formulate hypotheses also based on limited and incomplete information. Final assessment aims to evaluate whether the student has knowledge and understanding of the topics and has acquired interpretative competence and independence of judgment. The candidate must be able to communicate in a clear and unambiguous manner, even to non-expert stakeholders, the knowledge gained. The assessment is expressed in thirtieths. The pass mark will be reached when the student shows knowledge and understanding of the issues at least in broad outline, and proves to be able to transpose the content in solving a real problem. the student must also have presentation and argumentative skills as to allow the transmission of his knowledge to the examiner.
EDUCATIONAL OBJECTIVES	The course aims to provide the knowledge necessary for the understanding of the physical principles of the techniques and methodologies used in the diagnosis of cultural heritage with particular regard to non invasive and portable techniques. For each method of investigation, fields of application, advantages, limitations and specific case study in the Archeology will be will be illustrated.
TEACHING METHODS	lessons
SUGGESTED BIBLIOGRAPHY	A) Chimica e tecnologie dei materiali per l'arte, C. Quaglierini e L. Amorosi, Zanichelli 2° Ed.2012. ISBN: 9788808202499 B) La Diagnostica nei Beni Culturali - Moderni Metodi di Indagine, L. Paolillo e I. Giudicianni, Loghia Ed. Loghìa 2009. EAN: 9788895122175 C) Tecniche diagnostiche per i beni culturali, O.Piccolo, E.Puppin, Maggioli Editore 2008. EAN: 9788838743313 D) Physical techniques in the study of art, archaeology and cultural heritage. Vol. 1 and Vol. 2, Ed. D. Bradley e D. Creagh, Elsevier 2021. ISSN:1871-1731 E) Conservation Science for the Cultural Heritage. Applications of Instrumental Analysis, serie «Lecture Notes in Chemistry» 79, Springer (2013). ISSN: 0342-4901

	F) Articoli forniti dal docente.

SYLLABUS

Hrs	Frontal teaching
1	Presentation of the course, of the modalities of the examination and drafting the elaborate.
2	Notes on atomic and molecular structure and on the radiation-matter interaction.
2	Procedures to obtain information. Keywords. Sensitivity of a technique, Non invasive and invasive tecniques. Microdestructive methologies. Sampling.
2	Materials and techniques for the realization of paintings. Chemistry of ancient pigments, binders, paints, lacquers.
3	Imaging Tecniques. Multispectral, Radiografy and Tomografy. Optical microscope.
6	Main analytical techniques for the characterisation in the filed of Cultural Heritage: X-ray fluorescence, Uv-vis, IR and Raman Spectroscopy. Determination of the color coordinates.
2	Effect of environmental conditions on the conservation state and degradation processes of various archaeological finds with particular attention to underwater woods and metals.
12	Presentation of case studies looking for the methods for obtaining information (es. paintings on ceramics, fresco, metals, underwater archeological woods, textiles).