



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Culture e società
<b>ACADEMIC YEAR</b>	2023/2024
<b>MASTER'S DEGREE (MSC)</b>	ARCHAEOLOGY
<b>SUBJECT</b>	3D SURVEY FOR ARCHAEOLOGY
<b>TYPE OF EDUCATIONAL ACTIVITY</b>	B
<b>AMBIT</b>	50347-Archeologia e antichità classiche e medievali
<b>CODE</b>	21551
<b>SCIENTIFIC SECTOR(S)</b>	ICAR/06
<b>HEAD PROFESSOR(S)</b>	LO BRUTTO MAURO      Professore Associato      Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	
<b>CREDITS</b>	6
<b>INDIVIDUAL STUDY (Hrs)</b>	120
<b>COURSE ACTIVITY (Hrs)</b>	30
<b>PROPAEDEUTICAL SUBJECTS</b>	
<b>MUTUALIZATION</b>	
<b>YEAR</b>	2
<b>TERM (SEMESTER)</b>	1° semester
<b>ATTENDANCE</b>	Not mandatory
<b>EVALUATION</b>	Out of 30
<b>TEACHER OFFICE HOURS</b>	<b>LO BRUTTO MAURO</b> Monday    09:00    12:00    Dipartimento di Ingegneria - Area Geomatica - viale delle Scienze - Edificio 8 - scala F6 - secondo piano. Tuesday    09:00    12:00    Dipartimento di Ingegneria - Area Geomatica - viale delle Scienze - Edificio 8 - scala F6 - secondo piano.

DOCENTE: Prof. MAURO LO BRUTTO

<b>PREREQUISITES</b>	No preliminary knowledge is required
<b>LEARNING OUTCOMES</b>	<p>Knowledge and understanding The course provides the preliminary information necessary to an understanding the 3D survey techniques. In particular, the student will acquire the knowledge on the topographic, photogrammetric and laser scanning methods for the representation and documentation of archaeological heritage.</p> <p>Applying knowledge and understanding The student will be able to use tools for 3D surveys in areas of limited extension, to perform photogrammetric surveys, to use photogrammetric and laser scanning software for archaeological applications.</p> <p>Making judgments The student will be able to evaluate surveying techniques for the professional applications and the accuracy and limitations of the 3D surveys techniques.</p> <p>Communication skills The student will be instructed to present the results of surveys through technical and graphical representations.</p> <p>Learning skills During the course, the student will understand the evolution of the techniques as regards the theoretical and practical aspects.</p>
<b>ASSESSMENT METHODS</b>	The student will have to answer at least three or four oral questions, on all parts of the program. The final examination aims to assess if the student has knowledge of the course topics and has acquired competence over the main 3D survey methods. The level of sufficiency is achieved when the student shows at least the basic theoretical skills of the main topics of the teaching. Moreover, he should be able to use the main terms of technical language and to exhibit his basic knowledge to the examiner. Below this threshold, the examination will be insufficient. More the student will show his knowledge of the discipline and his ability to interact with the examiner, more the evaluation will be positive. The evaluation, out of thirty, will be assessed on the basis of the student level.
<b>EDUCATIONAL OBJECTIVES</b>	The aim of the course is to provide students with the theoretical and methodological knowledge for the 3D survey of Archaeological Cultural Heritage. These operations are widespread both during archaeological excavations and in the documentation and cataloguing phases. This course provides the basics of photogrammetry and laser scanning and some information for the critical evaluation of the results obtained during all survey phases.
<b>TEACHING METHODS</b>	Lectures, practices
<b>SUGGESTED BIBLIOGRAPHY</b>	<p>Bianchini M., Manuale di rilievo e di documentazione digitale in archeologia. Copia online <a href="http://www.rilievoarcheologico.it/manuale_rilievo8_index.htm">http://www.rilievoarcheologico.it/manuale_rilievo8_index.htm</a></p> <p>R. Cannarozzo, L. Cucchiari, W. Meschieri. Misure Rilievo Progetto per Costruzioni, Ambiente e Territorio. Vol. 1, Quinta edizione, Zanichelli Editore, 2017. ISBN: 9788808520906</p> <p>R. Cannarozzo, L. Cucchiari, W. Meschieri. Misure Rilievo Progetto per Costruzioni, Ambiente e Territorio. Vol. 2, Quinta edizione, Zanichelli Editore, 2017. ISBN: 9788808438812</p> <p>A. Riggio, R. Carlucci. Topografia di base. Fondamentali della geomatica per la misura e la rappresentazione del territorio. EPC editore, 2015. ISBN: 978-88-6310-579-7</p> <p>L. De Luca. La fotomodellazione architettonica. Rilievo, modellazione, rappresentazione di edifici a partire da fotografie. Dario Flaccovio Editore, 2010. ISBN 978-88-579-0070-4</p> <p>G. Guidi, M. Russo, J.A. Beraldin. Acquisizione 3D e modellazione poligonale. McGraw-Hill Companies, 2010. ISBN-10 : 8838665311 - ISBN-13: 978-8838665318</p>

## SYLLABUS

Hrs	Frontal teaching
4	General information about 3D survey
4	Theoretical principles of the terrestrial laser scanner. Procedures for surveying. The terrestrial laser scanner for 3D modelling.
4	Laser scanner survey phases: pre-processing, alignment, and mosaicking of scans.
4	Theoretical principles of photogrammetry, operating phases of a photogrammetric survey. Photogrammetric camera and camera network.
4	Ground control point, images orientation, photogrammetric triangulation, rectified imagery
Hrs	Practice
5	Applications of laser scanner survey to archaeology. Practical examples.

<b>Hrs</b>	<b>Practice</b>
5	Photogrammetric survey of archaeological sites. Photogrammetric 3D models