



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Architettura		
ACADEMIC YEAR	2018/2019		
MASTER'S DEGREE (MSC)	ARCHITECTURE AND BUILDING ENGINEERING		
SUBJECT	ADVANCED ARCHITECTURAL SURVEY TECHNIQUES		
TYPE OF EDUCATIONAL ACTIVITY	A		
AMBIT	50664-Rappresentazione dell'architettura e dell'ambiente		
CODE	19667		
SCIENTIFIC SECTOR(S)	ICAR/06		
HEAD PROFESSOR(S)	LO BRUTTO MAURO	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	9		
INDIVIDUAL STUDY (Hrs)	105		
COURSE ACTIVITY (Hrs)	120		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	LO BRUTTO MAURO 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.		

PREREQUISITES	Mathematical analysis, Geometry, Architectural draw with Laboratory
LEARNING OUTCOMES	knowledge and understanding The student will acquire mainly the knowledge about the techniques of photogrammetric survey of cultural heritage. The course will be directed towards the understanding of issues relating to the most modern instrumental techniques and their integration. Applying knowledge and understanding The student will be able to use their knowledge to solve problems concerning the architectural works; such information is necessary in several professional responsibilities. The student will be able to evaluate the most suitable survey methods and to understand the possible professional applications of the acquired techniques. The student will also be able to assess the accuracy and reliability of the metric measurements. Making judgements The discipline gives a critical capability that allows you to evaluate the procedures and the methods necessary to develop the required works. Communication skills The student will acquire the ability to expose our process and to illustrate the methodology followed by presentations with power point, graphic tables, charts and graphs. Such skills will be acquired through the realization of a final work that summarizes and describes a practical experience carried out independently by the student. Learning skills The activities carried out during the course and the different techniques proposed will stimulate students to acquire: - ability to know how update himself on the evolution of equipment and software - ability to consult publications in scientific texts and journals.
ASSESSMENT METHODS	The exam consists of a discussion on the topics of the course. During the discussion, the student can present a photogrammetric survey, done as final work of the course or, alternatively, he can do a practical test about the exercises carried out during laboratory. The choice between practical test and final work is done by the student. The final work can be done individually or in team. The student will take the oral exam individually even if he has worked with other students for the final work; he will be evaluated individually for his exam. The exam is aimed at ensuring the possession of the competencies and disciplinary knowledge provided by the course; in particular, it will evaluate the level of: knowledge of course content, ability to establish connections between the contents of the course, use of adequate technical language, ability to use the notions acquired in practical cases. The evaluation, out of thirty, will be assessed on the basis of the student level. The student must demonstrate elementary knowledge of the course topics to pass the exam and to obtain a score of not less than 18/30. The knowledge of the course topics is elementary when the student demonstrates that he/she has acquired a basic knowledge of the subjects described in the program, he/she is able to operate the links of the course arguments, he/she has acquired a limited level of autonomy and he/she has a suitable technical language to communicate with the examiners. The student must demonstrate that he/she has achieved excellent results to achieve a score of 30/30 with honours. The results are excellent when the student gains full knowledge of the topics of the program, the student demonstrates how to apply acquired knowledge in different/new/advanced contexts, the student uses the specific technical language with competence and the student is able to elaborate and express independent judgments based on acquired knowledge.
EDUCATIONAL OBJECTIVES	The course of Photogrammetric survey of architecture aims to provide the knowledge to plan a survey project, to execute it and to produce elaborate useful for interpretive analysis, for studies on the degradation or on the constructive characteristics, for monitoring of buildings. The course aims to provide students with adequate cultural and professional training, to survey and to represent the Cultural Heritage. The main educational goal is the teaching of the project of survey, intended not only as a compendium of metric operations, but even more as a complex system of critical decisions related to finding investigation purposes. In addition, the course is designed to make students aware of the possibilities and limits of modern methods for the acquisition of three-dimensional geometric data through the knowledge of the most modern techniques currently available.

	In particular, students mainly acquire the know about the three-dimensional survey photogrammetric and laser scanner techniques for Cultural Heritage. The Laboratory of Photogrammetric survey of architecture has the objective to allow students the use and application of theoretical concepts and techniques acquired during the lectures. in real case studies. The training program, developed in parallel to lectures, is completed with an acquisition of all the basics of topographical equipment, on digital cameras for photogrammetric survey, of the laser scanning systems, in order to get hold of modern methodological approaches.
TEACHING METHODS	Lectures, laboratory
SUGGESTED BIBLIOGRAPHY	De Luca L. – La fotomodellazione architettonica. Rilievo, modellazione, rappresentazione di edifici a partire da fotografie. Dario Flaccovio Editore, 2010. Guidi G., Russo M., Beraldin J.A. - Acquisizione 3D e modellazione poligonale. The McGraw-Hill Companies srl, 2010 Selvini A., Guzzetti F. – Fotogrammetria generale. UTET, Torino 2000.

SYLLABUS

Hrs	Frontal teaching
5	Definition of measurament. Notes on the statistical treatment of measurement errors (Theory of errors)
8	Topgraphical survey and topographical measurement of ground control points
5	Elements of analytical photogrammetry, collinearity equation
8	Photogrammetric project, photogrammetric cameras, camera calibration
10	Images orientation
10	Digital photogrammetry, automatic procedures
8	Terrestrial laser scanner for architectural survey
6	Rectified and ortorectified imgergy
Hrs	Workshops
5	Theory of errors
15	Topographic survey
15	Terrestrial laser scanner survey
10	2D photogrammetric survey
15	3D photogrammetric survey