



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2022/2023
BACHELOR'S DEGREE (BSC)	CIVIL ENGINEERING
SUBJECT	TOPOGRAPHY
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50282-Ingegneria della sicurezza e protezione civile, ambientale e del territorio
CODE	07626
SCIENTIFIC SECTOR(S)	ICAR/06
HEAD PROFESSOR(S)	DARDANELLI GINO Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	98
COURSE ACTIVITY (Hrs)	52
PROPAEDEUTICAL SUBJECTS	19109 - MATHEMATICAL ANALYSIS - INTEGRATED COURSE
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	DARDANELLI GINO Monday 10:00 13:00 dicam 2 PIANO EX DIPARTIMENTO DI TRASPORTI

PREREQUISITES	Knowledge of Mathematics: -Partial and total derivative; systems of equations Knowledge of Physics: -Vectors and arrays, vector components, polar coordinates, electromagnetic waves
LEARNING OUTCOMES	Knowledge and understanding -knowledge of land surveying problems, using topographic and photogrammetric techniques; in particular the students will be able to use theoretical knowledges and methodologies to acquire and elaborate data. They will be able to analyze in a critical way the results obtained to produce cartographic representation of the study areas with GIS method, evaluating and monitoring the time series of displacements of structures, landslides or other. Applying knowledge and understanding -The student will be able to design topographics and photogrammetrics surveying to create maps for the project of a civil or environmental structure and to monitor structures and landslides periodically. Making judgements -The student will be able to analyze and choose the best surveying techniques to create maps (medium and large scale maps), monitoring and evaluating the displacements of civil and environmental engineering structures through the use of available resources Communication skills -The student will be able to talk about problems of topographic and photogrammetric surveying and the topographic and cartographic applications with GIS, identifying any problems related to costs and time. Learning ability -Updating through scientific reviews developed in the geodetic and topographic science. The student should be attend postgraduate specialisation and advanced professional training courses based on the land surveying advanced techniques.
ASSESSMENT METHODS	The final examination consist of an oral exam, based on the contents addressed in the course. The oral examination questions will be open to verify the knowledges and the capabilities of the students about land surveying through techniques and instruments used in geodesy, topography, GPS and photogrammetry. The final assessment will be made on the basis of several conditions related to the level of knowledge about theoretical and practical models to solve topographic problems, according to a correct use of technical language. On the basis of the level of knowledge acquired (from an inadequate to an excellent level) and the technical language to explain the contents of the course, the grades are out of 30. The exam fails if the students don't have a sufficient knowledge of the contents addressed in the course; (rating 18-20/pass): sufficient knowledge of the main contents and sufficient use of technical language; (rating 21-23/satisfactory): knowledge of the main contents and use of technical language, low degree of autonomy in the application of theories to solve engineering problems related to land surveying; (rating 24-25/good): good knowledge of the contents and limited capability to apply several methodologies to solve engineering problems related to land surveying; (rating 26-29/very good): good knowledge of the contents and use of appropriate language, good capability to apply several methodologies to solve engineering problems related to land surveying ; (rating 30-30 e lode/excellent): excellent knowledge of the contents and correct use of language, excellent level of autonomy in the analysis of engineering problems and their solutions.
EDUCATIONAL OBJECTIVES	Acquisition of knowledge about theory and methodology to acquire and elaborate data, to make evaluations about results. Create maps of the study area and analyze the results of time series of the displacements of engineering structures.
TEACHING METHODS	Lectures, classroom exercises and surveying
SUGGESTED BIBLIOGRAPHY	Italiano Barzaghi R., Pinto., Pagliari D. Elementi di Topografia e trattamento delle osservazioni, Citta studi Edizione, 2018 ISBN: 882517425X Renato Cannarozzo, Lanfranco Cucchiari, William Meschieri, Misure, rilievo, progetto, Zanichelli, 2017 ISBN: 9788808520906 English Engineering Surveying Manual, American Society of Civil Engineers, 1985 ISBN-130-87262-460-9 Hoffmann-Wellenhof B., Lichtenegger H., Collins J.Global Positioning System, Springer Verlag Wien New York ISBN 978-3-7091-6199-9

SYLLABUS

Hrs	Frontal teaching
1	History of engineering surveying
2	Survey errors
2	Geodesy and reference systems
5	Cartography
4	Topographic instruments and measurements (angle, direction and elevation)
4	Topographic surveying methods (intersections, land surveying problems, triangulations, topographic networks)
6	Global Positioning Systems surveying (GPS, GLONASS, Galileo, Beidou)
2	Effect of ground movement on survey control, laser scanning
2	Geographical Information System, vector and raster model
Hrs	Practice
4	Survey errors
6	Cartography
6	Total station surveying
8	GPS surveying