UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali
ACADEMIC YEAR	2023/2024
MASTER'S DEGREE (MSC)	AGRICULTURAL PRODUCTIONS AND TECHNOLOGIES
SUBJECT	CAD AND GIS TECHNOLOGIES FOR AGRICULTURAL PROCESS MANAGEMENT
TYPE OF EDUCATIONAL ACTIVITY	D
AMBIT	20742-A scelta dello studente
CODE	22393
SCIENTIFIC SECTOR(S)	AGR/09
HEAD PROFESSOR(S)	GRECO CARLO Ricercatore a tempo determinato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	90
COURSE ACTIVITY (Hrs)	60
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**GRECO CARLO** Monday 10:00 13:00 Studio 138 Dipartimento Saaf Wednesday 10:00 13:00 Studio 138 Dipartimento Saaf Thursday 10:00 13:00 Studio 138 Dipartimento Saaf

DOCENTE: Prof. CARLO GRECO

PREREQUISITES	Knowledge of technical drawing and basics of cartography
LEARNING OUTCOMES	Knowledge and understanding capacity Through the course, the student will achieve basic literacy related to the main CAD and GIS software for the correct management of elaborate project graphs and spatial data analysis. the student will have acquired the ability to evaluate the opportunities offered by the use of GIS in dealing with territorial problems. Ability to apply knowledge and understanding At the end of the study path, the student will have developed the ability to independently use the main SW of CAD drawing, in order to correctly represent through two-dimensional and three-dimensional design technical elaborations the artefacts, agricultural buildings and elements of the territory. the student will be able to evaluate the possibilities of using SW GIS in the fields of research, management and analysis of problems related to the exercise of agriculture. the student will also have taken over the basic IT tools to store the geodata related to a territory, to extract the desired information and to propose an effective representation of it. Autonomy of judgment Upon passing the exam the student should have developed the ability to critically evaluate the application of different computerized drawing techniques applied to the representation of a building. Communication skills Upon passing the exam, the student should have gained sufficient technical language property, at least as regards the communication skills expressed thanks to the correct use of the programs used in the course. Learning skills The laboratory activities, together with the final work required, aim to introduce the student to the latest developments, in terms of the use of SW CAD and GIS providing the basic knowledge and skills to face, in the future, an autonomous deepening of these aspects through in-depth courses, masters, etc.
ASSESSMENT METHODS	The evaluation will be done through an examination of the drawings made with the chosen drawing tool computerized and used during the course. Prepare projects 75% divided as follows Explanation of theoretical aspects (knowledge) Graphic applications (competence) Autonomous choice of representation mode (Judgement) Oral examination 25% divided as follows Theoretical questions (knowledge) Graphic applications (competence) Properties of exposure (communication skills) The final check is to evaluate whether the student has mastered the software, as well as has acquired interpretative competence and autonomy in judging concrete cases. The evaluation is carried out with a suitably qualified judgment. The threshold of sufficiency will be reached when the student shows the mastery of using the software in the general guidelines and minimum application competencies for the resolution of concrete cases. Below this threshold, the examination will be insufficient. The more the examination shows the mastery and the ability to use the various software, the more the evaluation will be positive until the judgment is "praiseworthy".
EDUCATIONAL OBJECTIVES	the purpose of the course is to provide the fundamentals on the operation and use of the main CAD and GIS SW used in the field of agricultural professional activities. the student will be able to evaluate the possibilities of using SW in the fields of research, management and analysis of problems connected with the exercise of agriculture
TEACHING METHODS	Lectures and exercises. Lessons are always done using a personal computer and video projector
SUGGESTED BIBLIOGRAPHY	Data la rapidissima obsolescenza dei testi relativi agli argomenti trattati durante il corso, la bibliografia e' limitata ai manuali dei software utilizzati durante le esercitazioni. Una bibliografia piu' specifica per eventuali approfondimenti sara' fornita di volta in volta durante lo svolgimento del corso.

SYLLABUS

Hrs	Frontal teaching
3	Introduction to the course: aims, tools, exercises and exam methods. Introduction to CAD: Vector and raster graphics. Visualization and setting of the workspace, commands, menus and basic tools for drawing. Visualization tools.
3	Drawing tools: Drawing of fundamental geometric entities (point, line, polyline, spline, rectangle, polygons, circles, arcs of circumference, ellipses). The use of the SNAP command (object snap and temporary snap). Editing tools: The commands for copying, moving, rotating, repeating a drawing according to an axis of symmetry, drawing parallel elements, the SCALE, TRIM, EXTEND, STRETCH commands.
4	Formats of lines, texts and hatches. Setting up line styles. The text styles. The use of hatching in the drawing. Hatch styles. Change the origin of the hatches
3	Blocks: Using blocks. Creation of blocks within the design. Creating a block library
2	Dimension styles. Query menu (query, inquiry) and object properties. Length measurements, surface calculation, perimeter. Properties of the drawn elements.
2	Notes on the extraction of attributes in text files. References external (Xref) and inserting raster images. Inserting references to external files and their automatic updating
3	Printing and plotting. Setting the output device, the paper support, the drawing scale and the thickness and color of the pens. Paper space - model space. Layout of the documents in paper space. Draw in paper space and set the display scale (zoom) factor. Layout of overall drawings and details in a single table. Visualization of the layers in the different windows of the paper space.
3	Introduction to geographic information systems and relational databases
4	Vector and raster geographic data. Thematic maps. Management of table data. Representation of geographic data
4	Commercial (ArcGis) and opensource (QGis) software. Interface and main modules and extensions
4	Editing of the vectorial layer.
5	Use and management of raster layers. Treatment of remote sensing and drone images. Image enhancement

Hrs	Practice
10	From the survey to the representation and design of rural buildings
10	Production of thematic maps. Examples of data analysis and vegetation index calculation (NDVI, SAVI, EVI, GI). DEM and GRID processing