UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2023/2024
BACHELOR'S DEGREE (BSC)	CIVIL ENGINEERING
SUBJECT	DESIGN AND CAD
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50277-Ingegneria civile
CODE	07873
SCIENTIFIC SECTOR(S)	ICAR/17
HEAD PROFESSOR(S)	INZERILLO LAURA Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	9
INDIVIDUAL STUDY (Hrs)	129
COURSE ACTIVITY (Hrs)	96
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**INZERILLO LAURA** Monday 12:00 13:00 DIPARTIMENTO DI INGEGNERIA EDIFICIO 8EX DICAM PIANO TERRA STANZA 0018

DOCENTE: Prof.ssa LAURA INZERILLO

PREREQUISITES	The student is not expected to have specific skills.
LEARNING OUTCOMES	Knowledge: The student knows the general principles of projection and the specific features of parallel and perspective projection, so as the peculiar features of surfaces generated by the movement, revolvement (or the combination of both) of a figure. Understanding: The student is able to make out the features of a spatial layout starting from its graphic or photographic representation. Applying knowledge and understanding: The student is able to draw architectural elements (stairs, vaults) by means of pencil or ink, using orthogonal and oblique projection and perspective. The student is otherwis able to draw a house in orthogonal axonometry and in perspective. Making judgements: The student understands the links between design and representation. Communication skills: The student is able to draw correct drawings that properly represent the features of architectural elements and of a house. Learning skills: The student is able to study architecture both interpreting and producing drawing, according to a habit long practiced by Engigneer.
ASSESSMENT METHODS	The mark, reported in thirtieths, will result from the sum of three scores in tenths, where 6 means sufficient and 10 means excellent. Full marks will be granted if the sum of the scores is 30 and if the student leads the discussion with self-confidence. Score 1: Graphic test focusing the drawing of solids, of architectural elements (e.g. vaults and stairs) and the restitution of distances, angles and shapes from a given drawing or a photo. Score 2: Oral test, focusing the fundamentals of the Science of representation: the questions will start from the discussion on theoretical assumptions implicit in the graphic test; the student will be asked to make free hand drawings which refer to the discussed subjects. If some errors appear in the graphic test, the student will have the opportunity to discuss them with the commission. Score 3: Assessment of 10 plates in the format A2 (59,4*42cm) drawn with different techniques (pencil, black and colored inks) and on different papers (opaque and transparent). The plates will focus the representation of simple solid and architectural elements (opaque paper), the restitution from given drawings or photos (transparent paper) and the representation of a house in orthogonal axonometry and perspective (opaque paper). The scores will be assigned according to the following criteria: Graphic test Excellent (10): the graphic test is performed with no errors and a good graphic. Very good (9): the graphic test is performed with no errors and a satisfactory graphic. Good (8): the graphic test is performed with one error. Satisfactory (7): the graphic test is performed with two errors. Passing grade (6): the graphic test is performed with three errors Unsatisfactory: the graphic test is performed with more than three errors Oral test Excellent (10): the student proves a full mastery of the theoretical fundaments of the Representation science and, at the same time, is able to apply the concepts to exercises that are unfamiliar to him/her. Very good (9): the student proves a full mastery of the theoretical fundaments of the Representation science but reveals uncertainty in applying the concepts to exercises that are unfamiliar to him/her. Good (8): the student proves a good mastery of the theoretical fundaments of the Representation science and is able to evaluate the correspondence between the concepts and their application. Satisfactory (7): the student proves a good mastery of the theoretical fundaments of the Representation Passing grade (6): the student proves having studied the theoretical fundaments of the Representation science, but shows gaps in autonomous application. Unsatisfactory: the discussion shows gaps in the knowledge of the theoretical fundaments of the Representation science. Plates Excellent (10): The plates are correct and their graphic quality is excellent. Very good (9): The plates are correct and their graphic quality is very good. Good (8): The plates are correct and their graphic quality is very good. Satisfactory (7): The plates show one or two graphic errors. Passing grade (6): The plates show one or two conceptual errors Unsatisfactory: The plates show more than two conceptual errors.
EDUCATIONAL OBJECTIVES	Knowledge of the subjects underlying the transfer of spatial relations on a plane support (paper) and the inverse, that is finding out spatial relations from drawings. Comprehension of the links between the forms of architectural design and the forms of its representation.

	Knowledge of the geometrical layout of surfaces and of the process leading to determine the intersection between a surface and a straight line, a plane and another surface.
TEACHING METHODS	Teaching activity is made of lessons and of tests addressed to evaluate the response of students to the discussed subjects. The teacher reserves one morning a week (Monday from 9.00 to 13.00 in his room at the Building 8, first floor) to meet the students who need further explications or the review of drawings.
SUGGESTED BIBLIOGRAPHY	Riccardo Migliari, Geometria Descrittiva, 2 vol., CittaStudi, Roma 2009. Laura Inzerillo, assonometria e futuro, Aracne editrice, Roma, 2012, 978-8854851245 Laura Inzerillo, essere prospettici, aracne editrice, Roma, 2012, 978-8854849624 Dispense del corso. Video corso su youtube.

SYLLABUS

Hrs	Frontal teaching
2	ntroduction to the course. The section and projection process.
7	Monge projection. Representation of: point, straight line, plane. Particular points, straight lines, planes. Points on a straight line, stright lines on a plane. straight lines and plane that are parallel. Concept of the infinite in the space. Overlapping of a plane. Real form and real dimension of a polygonal figure. Meaning of the homology. Representation of a conic curve on a generic plane and on particular planes.
12	Monge projection: intersection between plane and pyramide, plane and cone, plane and cilynder, plane and sphere. Intersection between straight line and pyramid, intersection between straight line and prism, intersection between straight line and cone, intersection between straight line and cilynder, straight line and sphere.
7	Classification of surfaces

Hrs	Practice
6	Monge projection: intersection between solids. intersections between cilynder with the same either different ray. Intersection between cone and cylinder, cylinder and sphere. Representation of quadric curves: bull, hyperbolic paraboloid, parabolic paraboloid. Architectonic elements: caracol, vault, cylinder vault.
3	Exercices on orthogonal parallel projection.
3	parallel projections: applications
1	Exercises on oblique axonometry
8	Orthogonal and oblique assonometry. Representation of: point, straight line, plane. Particular points, straight lines, planes. Points on a straight line, stright lines on a plane. straight lines and plane that are parallel. Concept of the infinite in the space. Overlapping of a plane. Real form and real dimension of a polygonal figure. Meaning of the homology. Representation of a conic curve on a generic plane and on particular planes. Concept of generating straight line and direct curve. Pyramid, regural prism. Pyramid on a genric plane and on particular plane. Prism on a genric plane and on particular plane. Regular and oblique pyramid, regular and oblique prism. Representation of superior order conics. Cylinder and Cone. representation of cone and cilynder on oblique and generic planes either particular planes. representation of the sphere. Point on a Sphere , tangent plane to the sphere. Tangent sphere to a plane. intersection between plane and pyramide, plane and cone, plane and cilynder, plane and sphere. Intersection between straight line and pyramid, intersection between straight line and prism, intersection between straight line and cone, intersection between straight line and cilynder, straight line and sphere. intersection between solids. intersections between cilynder with the same either different ray. Intersection between cone and cylinder, cylinder and sphere. Representation of quadric curves: bull, hyperbolic paraboloid, parabolic paraboloid. Architectonic elements: caracol, vault, cylinder vault.
2	Assonometric representation: applications
4	Straight lines orthogonal to a plane in perspective
3	Exercises on perspective.
3	Outline of cone, sphere and cylinder in orthogonal and oblique parallel projection.
3	Representation of barrel, sail, cross and pavilion vaults and of multiple light and spiral stairs in orthogonal and oblique parallel projection

Hrs	Workshops
10	Monge projection: solid representation. Concept of generating straight line and direct curve. Pyramid, regural prism. Pyramid on a genric plane and on particular plane. Prism on a genric plane and on particular plane. Regular and oblique pyramid, regular and oblique prism. Representation of superior order conics. Cylinder and Cone. representation of cone and cilynder on oblique and generic planes either particular planes. representation of the sphere. Point on a Sphere , tangent plane to the sphere. Tangent sphere to a plane.

Hrs	Workshops
10	grapho-mumerical projection: representation of a point, straight line, plane. particular point, straight lines, plans. Point on a straight line, straight line on a plane. Parallellism. Overlapping of a plane. real form and dimension of a plane figure. homology. Representation of a conic in a generic and a particular plane. Representation of the solid volumes. Pyramid and prism on a generic and particular plane. Regular and oblique pyramid and prism. Cylinder and cone horizontal or on a generic and oblique plane. Sphere. Intersection between solid volumes and plane and between themselves. Intersection between straight line and plane and pyramide and cone and cylinder and sphere
4	Straight lines on a generic plane in assonometrich.
6	extreme samples: Grapho numeric projections, multiple orthogonal projections, assonometric projections
10	applications of civil manufacts