UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria		
ACADEMIC YEAR	2020/2021		
BACHELOR'S DEGREE (BSC)	BUILDING ENGINEERING, INNOVATION AND RETROFITTING		
INTEGRATED COURSE	DESIGN AND ELEMENTS OF CAD		
CODE	20403		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	ICAR/17, ING-IND/15		
HEAD PROFESSOR(S)	INZERILLO LAURA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)	INZERILLO LAURA MANCUSO ANTONIO	Professore Associato Professore Ordinario	Univ. di PALERMO Univ. di PALERMO
CREDITS	9		
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 **MANCUSO ANTONIO** Friday 11:00 13:00 Stanza del docente (Ed.8, I Piano, Scala F10). Per motivate ragioni e ammesso il ricevimento su Teams (codice stanza 3e6igac)		

DOCENTE: Prof.ssa LAURA INZERILLO

PREREQUISITES	La frequenza del corso non richiede specifici prerequisiti.
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	Oral exam with presentation of a drawing assigned during the course. The exam will be carried out through an interview that will try to ascertain the learner's ability to process the knowledge acquired by using it to overcome the problems that are placed, and the ability to express themselves in technically correct language on the teaching content. In particular, exercises will be placed in order to simulate real cases of existing geometrically complex buildings, with pitches, recesses and overhangs and if the learner shows himself particularly, buildings with quadric and conical roofs of the 2nd degree. The aim is to evaluate the learner's ability to read and know how to represent, in the different techniques studied during the course, any geometry thought or real. The learner must demonstrate that he has acquired ease in representing and analyzing any type of geometry applicable in the construction field, from that present in the plants to that present in the concrete forms of the building, from reading the slopes to the intersection of solids, to the fittings, to the interpenetration between solids. The aforementioned skills will also be assessed through the elaborate graphic created through the use of CAD. The evaluation is expressed in thirtieths with possible honors, according to the following scheme: excellent 30– 30 with distinction. Excellent knowledge of the topics and very good language skills. Good analytical skills. The student is able to use the knowledge he/she has acquired to solve problems. very good 26-29 Good grasp of the topics. Sound language skills. The student is able to use the knowledge he/she has acquired to solve problems. good 24-25 Basic knowledge of the main topics. Fair language skills with limited ability to independently use the knowledge acquired to solve problems. satisfatory 21-23 The student lacks a firm grasp but has some knowledge of the main topics. Satisfactory language skills. Low ability to independently use the knowledge acquired. sufficient 18-20 Minimum basic knowledge of the main topics and technical language. Very low ability to in.dependently use the knowledge acquired. fail The student does not have an acceptable knowledge of the topics
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.

MODULE
ELEMENTS OF CAD

Prof. ANTONIO MANCUSO

SUGGESTED BIBLIOGRAPHY	
Dispense e lucidi forniti dal docente.	
AMBIT	10685-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	49
COURSE ACTIVITY (Hrs)	26
EDUCATIONAL OBJECTIVES OF THE MODULE	
The course is aimed to provide the ability in the representation and modelling of objects by means of commercial software like for instance, AutoCAD or Rhinoceros. The educational objective concerns the student's ability in solving simple problems applying a general scientific methodology. During the course, in fact, the students will be involved in problem solving according to the modern design criteria. They will be asked to make choices, apply methods and synthesize all the information in a draft computer made or hand sketched. These educational objectives are functional to the continuation of engineering studies	

SYLLABUS

Hrs	Frontal teaching
5	CAD systems: classification, main characteristics, application criteria.
5	Two dimensional modeler based on primitives. Technical drafting set up. Graphical standards exchange formats (IGES, STL, DXF).
4	Orthographic views of simple systems. 3D CAD modeler CSG based.

Hrs	Practice
4	UNI Standards and practical applications
4	Generation of executive drafting.
4	Drafting management and post-processing

MODULE
DRAWING

Prof.ssa LAURA INZERILLO

SUGGESTED BIBLIOGRAPHY

Riccardo Migliari, Geometria Descrittiva, 2 vol., CittaStudi, Roma 2009.
Dispense del corso.
Video corso su youtube

AMBIT	50109-Formazione di base nella storia e nella rappresentazione
INDIVIDUAL STUDY (Hrs)	69
COURSE ACTIVITY (Hrs)	81

EDUCATIONAL OBJECTIVES OF THE MODULE

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

SYLLABUS

Hrs	Frontal teaching
1	Introduction to the course. The section and projection process.
5	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.
5	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.
2	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.
2	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.
1	Oblique axonometry
3	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	Graphonumerical projection: point, straight line, plan, solid and inclination straight line

Hrs	Workshops
5	Exercices on orthogonal parallel projection. Buildings representation with plants, transversal and longitudinal sections and above view. Inclinated and plan roof
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5	complex buildings representation designed with conics and quadrics. examples of existing buildings
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5	Applicative laboraotry: Monge
5	applicative laboratory: Orthogonal axonometrich
5	complex buildings representation designed with conics and quadrics. examples of existing buildings
5	applcative laboratory: graphonumerical projection
5	Applicative laboraotry: Monge
5	applicative laboratory: Orthogonal axonometrich
5	laboratorio applicativo: proiezioni quotate applcative laboratory: graphonumerical projection