UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2023/2024
BACHELOR'S DEGREE (BSC)	MECHANICAL ENGINEERING
SUBJECT	COMPUTER AIDED DESIGN
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50302-Ingegneria meccanica
CODE	02605
SCIENTIFIC SECTOR(S)	ING-IND/15
HEAD PROFESSOR(S)	NIGRELLI VINCENZO Professore a contratto in quiescenza Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	12
INDIVIDUAL STUDY (Hrs)	192
COURSE ACTIVITY (Hrs)	108
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**NIGRELLI VINCENZO** Wednesday 10:00 12:00 Ufficio Nigrelli DI Edificio 8, I piano. Durante l'emergenza sanitaria, il ricevimento si svolgera on line su piattaforma TEAMS stanza "Ricevimento Nigrelli". Il codice di accesso verra fornito su richiesta per e-mail, prenotando il ricevimento.

DOCENTE: Prof. VINCENZO NIGRELLI

PREREQUISITES	None
LEARNING OUTCOMES	Knowledge and understanding: Students, at the end of the course, will have a good knowledge about the technical drawing as a graphic language to communicate technical information, 2D and 3D CAD software, the representation and the dimensioning of single parts and assembled systems, and knowledge about main joining methods, the unified machine elements, dimensional and geometric tolerances. Applying knowledge and understanding: Students will be able to understand and to make, by computer tools, 2D and 3D models of single parts and assemblies. Making judgements: Students will be able to understand the correct functioning of the represented components. Communication skills: Students will be able to communicate all the issues concerning the subject of the course. Learning skills: Students, at the end of the course, will have learned the interactions between the different components of an assembly. The personal study, lectures and exercises in computer laboratory will allow them to develope learning skills to continue their studies with greater autonomy and discernment.
ASSESSMENT METHODS	Final examination is structured in three parts: a practical - computer-based- (weight 0.5), a written (weight 0.2) and an oral (0.3) test. Final evaluation results as weighted average of the three above parts. The computer-based practical test allows to evaluate the ability of the student to represent, according to the technical rules, simple components joined each other. Test duration: four hours. The written test is composed at least of three open-ended questions, one of which concerns the dimensional tolerances. The aim is to evaluate the knowledge of the main arguments and the communicative skill. Test duration: one hour. During the oral test, at least two questions, one of which is aimed to clarify the issues of the graphic and written tests, will be asked. The aim is to evaluate the mastery of the skills and the disciplinary knowledge of the course as well as the language skill and the capability of analysis and application of knowledge. At the end of the first half of the course, students can perform a (in-progress) computer-based practical test (assigned time: 3 hours) concerning the already developed contents; if the students pass this test, the obtained vote (weigh 0,3) wil be weighted with the one gained in the final exam (weight 1) that will concern the contents developed in the second part of the course. Evaluation Criteria Rating: Excellent; mark: 30-30/L; Outcome: excellent knowledge of all arguments, excellent communication skill, good analytical ability, the student is able to apply knowledge to solve the proposed problems Rating: Very good; mark: 27-29; Outcome: good mastery of all arguments, good communication skill, the student is able to apply knowledge to solve the proposed problems Rating: Good; mark: 24-26; Outcome: basic knowledge of the main arguments, discrete communication skill, with limited ability to independently apply the knowledge to the solution of the proposed problems Rating: Satisfactory; mark: 21-23; Outcome: not full mastery, but low knowledge, of the main arguments, satisfactory communication skill, poor ability to independently apply the acquired knowledge Rating: Adequate; mark: 18 -20; Outcome: minimal basic knowledge of the main arguments and of the technical language, very poor or no ability to independently apply the acquired knowledge Rating: Insufficient; mark: <= 17; Outcome: inadequate knowledge of the contents of the arguments of the course
EDUCATIONAL OBJECTIVES	Students, at the end of the course, will know the problems concerning the representation and dimensioning of individual parts or assemblies. They will know how to join different components of an assembly. Students will be able to make, also using computer tools, 2D and 3D models of single parts and assemblies of which they will be able to understand the correct functioning.
TEACHING METHODS	Lectures in the classroom, exercises in computer laboratory.
SUGGESTED BIBLIOGRAPHY	CHIRONE - TORNINCASA, Disegno tecnico industriale, Il capitello, vol.I (ISBN: 9788842674436) e vol.II (ISBN:9788842676218). Norme UNI – Disegno Tecnico: Principi e applicazioni generali di disegno

	meccanico e industriale; organi meccanici; specificazioni dimensionali e geometriche di disegno meccanico e industriale; schemi simboli e tolleranze di disegno meccanico e industriale; UNI, Milano, ultima edizione. Sono reperibili sul portale slide utilizzate per le lezioni dal docente

SYLLABUS

Hrs	Frontal teaching
4	Overview: technical drawing; general rules and tools for technical drawing; use and application of standardized lines.
6	Graphical projections: parallel (orthogographic and oblique) projections; Monge ortogographic projection method. First angle (european) orthographic projection method.
6	Cutting planes and sectional views: section mode, section lines and patterns, standards.
5	Standards and main systems of dimensioning.
5	Manufacturing tolerance.
3	Intersections of surfaces and solids.
2	Overview about joints.
10	Threaded joints: thread standards and definitions, bolted, screw and stud joints; tools to prevent fastening loosening; thread efficiency.
4	Welded joints
2	Not threaded removable connections
3	Introduction to CADs. Main characteristics and of 2D CAD (Computer Aided Drafting) tools.
1	Wireframe-based 3D CAD.
1	Surface-based 3D CAD.
8	Solid-based 3D CAD.
1	Parametric modelling
2	Curves and surfaces modeling

Hrs	Practice
6	Graphical projections: parallel (orthogographic and oblique) projections; Monge ortogographic projection method. First angle (european) orthographic projection method.
6	Cutting planes and sectional views: section mode, section lines and patterns, standards.
3	Manufacturing tolerance.
9	Joining and dimensioning
12	3D CAD modeling
6	Components modeling and assembling
3	Curves and surfaces modeling