Syllabus

Course Description

Course Title	Representation of mechanical components with CAD software
Course Code	42201
Course Title Additional	
Scientific-Disciplinary Sector	IIND-03/B
Language	English
Degree Course	Bachelor in Industrial and Mechanical Engineering
Other Degree Courses (Loaned)	
Lecturers	Prof. Yuri Borgianni, Yuri.Borgianni@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/35189 dr. Lorenzo Maccioni, Lorenzo.Maccioni@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/37418
Teaching Assistant	
Semester	Second semester
Course Year/s	1
CP	3
Teaching Hours	16
Lab Hours	18
Individual Study Hours	41
Planned Office Hours	9
Contents Summary	The scope of the course is to introduce the most important mechanical components, their function, and their representation in the technical drawing; this is supported using 2D CAD systems.
Course Topics	• Threaded connections and other joints • Bearings • Gears

	• Other mechanical components • 2D CAD modelling for mechanical assemblies
Keywords	Tolerance; roughness; mechanical connection; bearing; CAD
Recommended Prerequisites	The completion of the course "Fundamentals of Technical Drawing", which provides the necessary concepts for the understanding of the present course. The concepts illustrated in "Fundamentals of Technical Drawing" will be taken for granted
Propaedeutic Courses	
Teaching Format	The course includes classroom lectures in which the topics are presented by the lecturers; digital presentations (uploaded slides) will be used, and the blackboard will be frequantly employed as a support. Some explanations will be also supported by the use of a 2D-CAD application (AutoCAD). The practical exercises will be carried out both in a paper-based fashion and by using PCs. In some classes, the interaction with physical mechanical parts and assemblies is foreseen, to foster understanding.
Mandatory Attendance	Attendance is not compulsory
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding 1) functioning of machine elements within mechanical systems 2) representation of main machine elements and assemblies 3) design of mechanical systems fulfilling basic requirements, for example functionality and assemblability 4) usage of a 2D-CAD system for technical drawings of mechanical systems Applying knowledge and understanding 5) applying drawing standards for mechanical parts and assemblies correctly 6) approaching the design of mechanical structures

	7) identification of criticalities and alternatives in mechanical systems Making judgements 8) pointing out pros and cons with respect to the choice of tolerances and surface roughness values in mechanical components 9) evaluating which machine elements are best integrated in complex technical systems, according to constraints and expected performances 10) evaluating which CAD functions are most supportive and pertinent according to the scopes of technical representation Communication skills 11) using the appropriate terms for the illustrated mechanical components and their variants 12) describing the function of the illustrated mechanical components in an effective way Learning skills 13) Ability to autonomously extend the knowledge acquired during the study course also through a project run independently
Specific Educational Objectives and Learning Outcomes (additional info.)	-
Assessment	The assessment will be made based on a project of a mechanical assembly, which will be then discussed during an oral examination. The latter includes questions and exercises related to all contents presented during the course. The project objectives and topic will be communicated by the

	lecturers; students will have to design and represent a suitable solution accordingly. The project assembly and its parts will be drafted (i.e. represented according to the rules of technical drawing along with dimensions and tolerances) through the used 2D-CAD software and then transformed into pdf files (one file for each assembly and parts requiring drafts). The assessment will take into account the quality of the project, the correctness of the representations made in line with the rules and standards of the technical drawing, the answers to the questions asked during the oral examination. Dates and deadlines will be communicated during the course. Summative assessment: 70% Project (addressed Learning Outcomes 1-6, 13) 30% Oral exam (addressed Learning Outcomes 7-12)
Evaluation Criteria	In line with the addressed Learning Outcomes 1-6, the evaluation criteria of the project include the correctness of the drawing in terms of representation and choice of mechanical components, the accurate indication of tolerances, the effective use of the 2D-CAD system. Students will be encouraged to explore the integration of mechanical components that have been treated in the course (Learning Outcome 13) beyond those possibly communicated as requirements. In line with the addressed Learning Outcomes 7-10, students will be asked, during the oral exam, to justify their choices, indicate alternatives. The oral exam will also test communication skills with particular reference to the correctness of the used technical language and the capability of describing the mechanical function of components and assemblies (Learning Outcomes 11, 12). The oral exam will also serve to verify the actual commitment of each student in the presented project.
Required Readings	Slides and other materials provided by the lecturers during the course. All materials will be shared in the repository used (MS Teams).
Supplementary Readings	To extend the knowledge of mechanical components and assemblies, many handbooks are available. The most updated one, coping with standards that apply in Italy, is

	"Vademecum per Disegnatori e Tecnici" (Baldassini, Fiorineschi), 24th edition.
Further Information	-
Sustainable Development Goals (SDGs)	Industry, innovation and infrastructure, Quality education