Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Technical Drawing and Industrial Engineering Methods
Course code	42146
Scientific sector	ING-IND/15
Degree	Bachelor in Industrial and Mechanical Engineering (L-9)
Semester	2
Year	*I*
Academic year	2020-2021
Credits	6
Modular	*No*

Total lecturing hours	44
Total lab hours	
Total exercise hours	16
Attendance	Highly recommended
Prerequisites	
Course page	

Specific educational objectives	The course belongs to the set of basic teachings within industrial engineering and, as a result, for the Bachelor in Industrial and Mechanical Engineering. It introduces the fundamental notions as regards the contents of SSD ING-IND/15.
	The course's objective is to provide students with the required skills about representation techniques for the technical drawing and the function of mechanical components. Students will be able to exploit the knowledge acquired during the course in order to improve product development cycles.
	
	More in details, the treated topics follow:
	
	• Drawing standards and representation options:
	  ○ drawing lines
	  ○ orthographic projections and axonometric drawings
	  ○ section drawings
	
	• Representation of machine components and simple assemblies
	  ○ dimensioning
	  ○ dimensional tolerances
	  ○ geometric tolerance
	  ○ surface roughness
	
	• Machines' main components:

	○ screws, bolts, nuts and and threaded connections ○ shaft-hub connections ○ permanent joints ○ gears ○ bearings ○ other elements

Lecturer	*Yuri Borgianni, L5-03, yuri.borgianni@unibz.it, +39 0471 017821 - https://tinyurl.com/jeet4cr*
Scientific sector of the lecturer	ING-IND/15
Teaching language	English
Office hours	From Monday to Friday, upon email request
Teaching format	Frontal lectures and exercises

Learning outcomes	Knowledge and understanding 1) fundamentals and formalized representation standards of the technical drawing 2) tolerances and other imperfections of real mechanical parts 3) representing machine elements and understanding their function within a complex mechanical system Applying knowledge and understanding 4) applying drawing standards correctly 5) representing a technical system accurately Making judgements 6) pointing out pros and cons with respect to the use of technical systems, selecting design alternatives, autonomously choosing (and justifying the choice of) a specific representation method in terms of, e.g. clarity, completeness and non-ambiguity 7) evaluating which machine elements are best integrated in more complex technical systems, according to constraints and expected performances 8) being critical with respect to standards and drawing practices that are used in countries that have not adopted European standards or that have been abandoned Communication skills 9) using the appropriate terms for the illustrated mechanical components and their variants 10) describing the function of the illustrated mechanical components in an effective way Ability to learn

	11) Ability to autonomously extend the knowledge acquired during the study course by reading and understanding.

Assessment	Written exam, which includes practical exercises (e.g. projections, sections and axonometric drawing), calculation of relevant parameters for mechanical parts or assemblies (e.g. dimensional tolerances, properties of bearing or gears), individuation and recognition of mechanical components and properties thereof, questions about the course's contents. An exam simulation will be uploaded in the OLE system, on which students will train during the last Exercise of the course with the lecturer's support. The kind of exercises proposed during the course are eligible to be included in the exam as well.
Assessment language	English
Evaluation criteria and criteria for awarding marks	The final evaluation is based on the outcomes of the written exam, which includes practical exercises and questions about theoretical aspects. A clear indication will be given of the maximum number of points that students can achieve by solving each exercise or task. The assessment procedure evaluates • the capability of interpreting and representing technical systems correctly (1, 4, 5), by means of exercises aimed at drafting and making representations such as projections, sections and axonometric drawings; • the capability of leveraging dimensioning, dimensional/form tolerances and roughness indications, as well as characterizing fits (2) through specific exercises • the understanding of the concepts about machine elements and their functions through questions and exercises (3), as well as the correctness and clarity of answers (9, 10), which will be evaluated through open questions. The non-mentioned items of the above Learning Outcomes will be trained during the course as well. Items 6-8 concerning the capability to make judgments will be stimulated during lectures, since the lecturer will ask the students to agree on design and drawing choices that have been made – some of them will, besides, present shortcomings. Item 11 will be monitored by providing supplementary material; students will be invited to read and analyze texts that concern topics closely related to technical drawing and report the main concepts, which, in turn, support the comprehension of design choices and representation standards.

Required readings	Handouts of the course supplemented by extracts of

	selected books and Internet websites.
Supplementary readings	Some extra material will be provided (in Italian and German beyond English) in order to support students' comprehension; however, it will not correspond to the contents of the course completely.