Syllabus

Descrizione corso

Titolo insegnamento	Algebra Lineare
Codice insegnamento	42195
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	MATH-02/B
Lingua	Inglese
Corso di Studio	Corso di laurea in Ingegneria Industriale Meccanica
Altri Corsi di Studio (mutuati)	
Docenti	prof. Giovanni Modanese, Giovanni.Modanese@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/494
Assistente	
Semestre	Primo semestre
Anno/i di corso	1
CFU	6
Ore didattica frontale	47
Ore di laboratorio	13
Ore di studio individuale	90
Ore di ricevimento previste	18
Sintesi contenuti	- Spazi vettoriali - Geometria dello spazio - Matrici - Sistemi lineari - Determinante e grado - Trasformazioni lineari
Argomenti dell'insegnamento	Manca testo in italiano.
Parole chiave	Vectors spaces, Geometry of space, Matrices, Linear systems,

	Determinants and rank, Linear transformations
Prerequisiti	Precalculus.
Insegnamenti propedeutici	
Modalità di insegnamento	Frontal lectures and exercises.
Obbligo di frequenza	Recommended.
Obiettivi formativi specifici e risultati di apprendimento attesi	The course belongs to the area of core fundamental sciences, specifically to the sector of mathematics, informatics and statistics. It is a mandatory course. It aims at providing students with general scientific contents and method characteristic of (1) Linear algebra of vectors and matrices. (2) Analytical geometry of tridimensional space, with vector methods. The knowledge of these topics is a prerequisite for several other courses, especially Physics, Mathematical Analysis II, Electrotechnics. 1) Knowledge and understanding of concepts, symbolism and techniques of linear algebra, analytical geometry of space, complex algebra. 2) Applying knowledge and understanding in solving exercises and problems which require a formalization, tools and methods learned in the course (for example, by solving linear systems, determining the rank and inverse of a matrix, decide whether some vectors are linearly independent, finding the Cartesian and parametric equations of straight lines and planes in space, solving an algebraic equation in the complex field). 3) Making judgments in tackling with the right approach and convenient tools problems and questions suitable to be formulated mathematically. 4) Communication skills in reporting on the calculations in a clear and effective way. This is also essential for the student to be able to check his/her own results and overcome deadlocks in the resolution procedure. 5) Learning skills through the acquisition and assimilation of a symbolism, methods and tools which are necessary to understand the content of a consistent part of the courses in this academic curriculum.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	Written exam, consisting in 8-10 exercises containing various

	specific questions. - Summative assessment: 100% written exam: 2.5 hours; ILOs assessed: 1 - 5. With reference to Learning Outcomes 1-5, the assessment is based on the following points: 1) The student must understand the questions and place them exactly in the context of the theory explained in the course. 2) The student must solve the exercises and arrive at the correct result, thus applying the knowledge and understanding of the course issues. 3) The student must describe the calculations which lead to the final result, thus proving the ability of making judgments, this being evidenced by the choice of suitable solving methods. 4) The clarity and completeness of the description allows and evaluation of communication skills. 5) Altogether, the way in which the written examination is worked out allows to assess the learning skills of the student; in particular, it allows to see whether the student masters all the program, or some sections are missing.
Criteri di valutazione	The evaluation is expressed through a unique mark. For the exam to be passed, the mark has to be greater or equal to 18/30. Relevant for assessment are: the identification of a suitable solution method (making judgements), the knowledge of formulae and/or tools to apply and/or use (knowledge and understanding), the logic and clarity of the arguing (communication skills), the ability to correctly complete exercises (applying knowledge), the number of exercises solved.
Bibliografia obbligatoria	Geza Schay, A concise introduction to linear algebra, Birkhauser, 2012; e-ISBN 978-0-8176-8325-2 (free personal copy can be downloaded from the Library).
Bibliografia facoltativa	Günter M. Gramlich, „Lineare Algebra: Eine Einführung“, Carl Hanser Verlag. M. Abate, “Geometria”, McGraw-Hill. M. Abate, “Algebra lineare”, McGraw-Hill.
Altre informazioni	
Obiettivi di Sviluppo	Istruzione di qualità

Sostenibile (SDGs)	