unibz
Fakultät für Ingenieurwesen
Facoltà di Ingegneria
Faculty of Engineering

COURSE DESCRIPTION – ACADEMIC YEAR 2024/2025

Course title	**Introduction to Linear Algebra and Discrete Mathematics**
Course code	76435
Scientific sector	MAT/02
Degree	Bachelor in Informatics and Management of Digital Business (L-31)
Semester	1
Year	1
Credits	6
Modular	No

Total lecturing hours	40
Total lab hours	20
Attendance	Attendance is not compulsory, however, it is recommended. Non-attending students have to contact the lecturer at the start of the course to agree on the modalities of the independent study.
Prerequisites	There are no prerequisites.
Course page	https://ole.unibz.it/

Specific educational objectives	• Type of course: "di base" for L-31 • Scientific area: "Formazione matematica-fisica" for L-31 The aim of this course is to present a rather comprehensive treatment of linear algebra and discrete mathematics, giving a general overview of the field, giving a general overview of the field. It covers vector, matrix and numbers theory, sets, functions and graphs to some degree of mathematical logic and rigour, emphasizing topics that are in support of computer science. The course also provides practice in using the tools of mathematics to solve problems and to make judgements autonomously.

Lecturer	Bruno Carpentieri
Contact	Office B1.5.23, Faculty of Engineering, NOI Techpark, Via Bruno Buozzi 1, bruno.carpentieri@unibz.it, +39 0471 016027, Teams
Scientific sector of lecturer	MAT/08
Teaching language	English
Office hours	Monday 16:00-18:00, Faculty of Engineering, NOI Tech Park, Via Bruno Buozzi str. 1, Office B1.5.23 (it is recommended to make an appointment by email).
Lecturing Assistant (if any)	--
Contact LA	--
Office hours LA	--
List of topics	• Background on complex numbers, trigonometry and polynomials, sets, functions and counting • Vectors and matrices • Linear systems • Graphs and matrix representations • Logic of compound statements • Mathematical induction and recursion

Teaching format	This course will be delivered through a combination of formal lectures and exercises.

Learning outcomes	Knowledge and understanding: • D1.1 - Possess basic knowledge of mathematical analysis, algebra, numerical calculation and optimisation methods which support computer science and advanced economics. Applying knowledge and understanding: • D2.1 - Ability to use mathematics and statistical data analysis tools to solve computational problems. Learning skills • D5.1 - Learning ability to undertake further studies with a high degree of autonomy.

Assessment	Written exam, consisting of a set of verification questions, transfer of knowledge questions and exercises. The aim of the assessment is to check to which degree students have mastered the following learning outcomes: 1) knowledge and understanding, 2) applying knowledge and understanding, 3) making judgment. The same rules apply to both attending and non-attending students.
Assessment language	English
Assessment Typology	Monocratic
Evaluation criteria and criteria for awarding marks	Final Written Exam, 100% covering the full program. Written exam questions will be evaluated in terms of correctness, clarity, quality of argumentation, problem solving ability. The same rules apply to both attending and non-attending students.

Required readings	• Introduction to Linear Algebra, Fifth Edition, author: Gilbert Strang, Publisher: Wellesley-Cambridge Press, Print ISBN: 978-0980232776 • Algebra lineare (Italian), First Edition, author: Gilbert Strang, Publisher: Apogeo Education, Print ISBN: 978-8838786075 • Matrix Analysis and Applied Linear Algebra, author: Carl D. Mayer, Publisher: SIAM, Print ISBN: 978-0898714548 • Discrete Mathematics with Applications, Fourth Edition, author: Susanna S. Epp, Publisher: Cengage Learning, Print ISBN: 978-0495391326 Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it
Supplementary readings	• Coding the Matrix Linear Algebra through Applications to Computer Science, First Edition, author: Philip N. Klein, Publisher: Newtonian Press, Print ISBN: 978-0615880990

	• Discrete Mathematics and its Applications, Seventh Edition, author: Kenneth H. Rosen, Publisher: McGraw-Hill, Print ISBN: 978-0073383095
Software used	No software is needed