SYLLABUS
COURSE DESCRIPTION YEAR 2025/26

COURSE TITLE	**Discrete Mathematics**
COURSE CODE	76239
SCIENTIFIC SECTOR	MATH-01/A
DEGREE	Bachelor in Computer Science
SEMESTER	1st
YEAR	1st
CREDITS	6

TOTAL LECTURING HOURS	40
TOTAL LAB HOURS	20
ATTENDANCE	Attendance is not compulsory but 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 for this course.
COURSE PAGE	The course page will be made available on the Microsoft Teams class for this course and/or on https://ole.unibz.it, as communicated by the lecturer. Additional materials can also be found in the university's Reserve Collection at https://www.unibz.it/en/services/library/new-rc/.

SPECIFIC EDUCATIONAL OBJECTIVES	This course belongs to the type "Attività formative di base" and the subject area is "Matematica-Fisica". The aim of this course is to introduce students to basic topics in discrete mathematics. An overview of proof methods and their relation to logic will be given. The induction principle is introduced in a number of variants, and methods to analyse and describe the main properties of relations, functions, graphs and trees will be studied. We will also introduce the basic principles governing the mathematical definitions of infinite sets and of countability.

LECTURER	Oliver Kutz (oliver.kutz@unibz.it)

SCIENTIFIC SECTOR OF THE LECTURER	INFO-01/A
TEACHING LANGUAGE	English
OFFICE HOURS	Office BZ B1 5.36, announced in lecture and by appointment via email
TEACHING ASSISTANTS	/
OFFICE HOURS	/
LIST OF TOPICS COVERED	– Elements of logic, propositions and quantifiers, methods of mathematical proof – Numbers and basic number theory – Set Theory, Russell Paradox and Halting Problem – Functions, infinite cardinalities and countability – Relations, orders, equivalence classes – Graphs and trees
TEACHING FORMAT	The course includes frontal lectures and lab exercises.

LEARNING OUTCOMES	Knowledge and Understanding – D1.1: Have a solid knowledge of mathematical analysis, algebra, numerical calculus, discrete mathematics and elementary notion of logic that are in support of computer science Applying knowledge and understanding – D2.1: Be able to use the tools of mathematics and logic to solve problems. Ability to make judgments – D3.2: Be able to work autonomously according to the own level of knowledge and understanding. Communication skills – D4.1: Be able to use one of the three languages English, Italian and German, and be able to use technical terms and communication appropriately. Learning skills – D5.1: Have developed learning capabilities to pursue further studies with a high degree of autonomy.

ASSESSMENT	The written exam includes verification questions, knowledge transfer tasks, and exercises.

ASSESSMENT LANGUAGE	English
EVALUATION CRITERIA AND CRITERIA FOR AWARDING MARKS	Final written exam counting 100% for the evaluation and covering the full program of the course. Written exam questions will be evaluated in terms of correctness, clarity, quality of argumentation, and problem solving ability.

REQUIRED READINGS	– Susanna Samuels Epp. Discrete Mathematics with Applications. Cengage Learning, 5th edition, 01 2019. ISBN 978-1337694193. URL: https://www.cengage.com/c/discrete-mathematics-with-applications-5e-epp/9781337694193.
SUPPLEMENTARY READINGS	– K.H. Rosen and K. Krithivasan. Discrete Mathematics and Its Applications: With Combinatorics and Graph Theory. McGraw-Hill Companies, 2012. ISBN 9780070681880.
SOFTWARE USED	If the use of specific software is required, it will be communicated during class by the lecturer.