

## SYLLABUS

### COURSE DESCRIPTION – ACADEMIC YEAR 2023/2024

<b>COURSE TITLE</b>	<b>Discrete Mathematics</b>
<b>COURSE CODE</b>	76239
<b>SCIENTIFIC SECTOR</b>	MAT/01
<b>DEGREE</b>	Bachelor in Computer Science
<b>SEMESTER</b>	1st
<b>YEAR</b>	1st
<b>CREDITS</b>	6
<b>TOTAL LECTURING HOURS</b>	40
<b>TOTAL LAB HOURS</b>	20
<b>ATTENDANCE</b>	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.
<b>PREREQUISITES</b>	None.
<b>COURSE PAGE</b>	<a href="https://ole.unibz.it/">https://ole.unibz.it/</a>
<b>SPECIFIC EDUCATIONAL OBJECTIVES</b>	<p>Type of course: "di base"          Scientific area: "matematico fisica"</p> <p>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.</p>
<b>LECTURER</b>	<a href="#">Oliver Kutz</a>
<b>SCIENTIFIC SECTOR OF THE LECTURER</b>	INF/01
<b>TEACHING LANGUAGE</b>	<b>English</b>
<b>OFFICE HOURS</b>	Wednesday 14.30-16:30, Office POS 303, Faculty of Computer Science, Piazza Domenicani 3, <a href="mailto:Oliver.Kutz@unibz.it">Oliver.Kutz@unibz.it</a> , +39 0471 016124

<b>TEACHING ASSISTANT</b>	Same as lecturer
<b>OFFICE HOURS</b>	To be confirmed and by email appointment
List of topics covered	<ul style="list-style-type: none"> <li>• Elements of logic, propositions and quantifiers, methods of mathematical proof</li> <li>• Numbers and basic number theory</li> <li>• Set Theory, Russell Paradox and Halting Problem</li> <li>• Functions, infinite cardinalities and countability</li> <li>• Relations, orders, equivalence classes</li> <li>• Graphs and trees</li> </ul>
<b>TEACHING FORMAT</b>	Frontal lectures; Exercises in Lab.
<b>LEARNING OUTCOMES</b>	<p><b>Knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Have a solid knowledge of mathematical analysis, algebra, numerical calculus, discrete mathematics and elementary logic that are in support of computer science.</li> </ul> <p><b>Applying knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Be able to use the tools of mathematics to solve problems.</li> </ul> <p><b>Making judgments</b></p> <ul style="list-style-type: none"> <li>• Be able to work autonomously according to the own level of knowledge and understanding.</li> </ul> <p><b>Communication skills</b></p> <ul style="list-style-type: none"> <li>• Be able to use one of the three languages English, Italian and German and be able to use technical terms and communication appropriately.</li> </ul> <p><b>Learning Skills</b></p> <ul style="list-style-type: none"> <li>• Have developed learning capabilities to pursue further studies with a high degree of autonomy.</li> </ul>
<b>ASSESSMENT</b>	<p>Written exam.</p> <p>The written exam consists of verification questions, transfer of knowledge questions and exercises. The learning outcomes related to knowledge and understanding, applying knowledge and understanding and those related to the student's ability to learn and apply the acquired learning skills, will be assessed.</p>
<b>ASSESSMENT LANGUAGE</b>	<b>English</b>

<b>EVALUATION CRITERIA AND CRITERIA FOR AWARDING MARKS</b>	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.
<b>REQUIRED READINGS</b>	Susanna Epp: Discrete Mathematics with Applications, Cengage Learning, 4th edition. [Main book]
<b>SUPPLEMENTARY READINGS</b>	Kenneth Rosen: Discrete Mathematics and its Applications, McGraw-Hill, 7th edition. [Auxiliary book]
<b>SOFTWARE USED</b>	