Syllabus

Descrizione corso

Titolo insegnamento	Discrete Mathematics
Codice insegnamento	76239
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	MATH-01/A
Lingua	Inglese
Corso di Studio	Corso di laurea in Informatica
Altri Corsi di Studio (mutuati)	
Docenti	prof. dr. Oliver Kutz, Oliver.Kutz@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/35483
Assistente	
Semestre	Primo semestre
Anno/i di corso	1
CFU	6
Ore didattica frontale	40
Ore di laboratorio	20
Ore di studio individuale	90
Ore di ricevimento previste	
Sintesi contenuti	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.
Argomenti dell'insegnamento	- Elements of logic, propositions and quantifiers, methods of mathematical proof, method of mathematical induction

	- Numbers and basic number theory - Set Theory, Russell Paradox and Halting Problem - Functions, infinite cardinalities and countability - Relations, orders, equivalence classes - Graphs and trees
Parole chiave	Logic and proof, number theory and sets, functions and cardinality, relations and orders, graphs and trees
Prerequisiti	There are no prerequisites for this course.
Insegnamenti propedeutici	
Modalità di insegnamento	The course includes frontal lectures and lab exercises.
Obbligo di frequenza	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.
Obiettivi formativi specifici e risultati di apprendimento attesi	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.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	The written exam includes verification questions, knowledge

	transfer tasks, and exercises.
Criteri di valutazione	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.
Bibliografia obbligatoria	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.
Bibliografia facoltativa	K.H. Rosen and K. Krithivasan. Discrete Mathematics and Its Applications: With Combinatorics and Graph Theory. McGraw-Hill Companies, 2012. ISBN 9780070681880.
Altre informazioni	If the use of specific software is required, it will be communicated during class by the lecturer.
Obiettivi di Sviluppo Sostenibile (SDGs)	Istruzione di qualità