אוניברסיטת
בן-גוריון בנגב

The Department of Mathematics

2022—23—B term

Course Name Discrete Mathematics for Data Engineers

Course Number 214.1.9111

Course web page
`https://www.math.bgu.ac.il//en/spring2023/courses/discrete-mathematics-for-data-`

Office Hours `https://www.math.bgu.ac.il/en/hours`

Abstract

Requirements and grading[1]

Course topics

Part A: Logic and set-theory. Propositional calculus, Boolean operations. Truth tables, the truth-value of a propositional formula (without induction at this stage), logical implication and logical equivalence, tautologies and contradictions, the useful tautologies, distributivity and de-Morgan's Law. Sets: the notion of a set, membership and equality, operations: union, intersection, set-dffierence and power-set. Ordered pairs and Cartesian products. Equivalence relations, quotient spaces and partitions.Partial orders. Functions, injective and surjective functions, invertibility of a function. The ordered set of natural numbers.The axiom of induction in dffierent forms.

Part B: Finite and infinite sets. The notion of cardinality. Countable sets. Cantor's theorem on the power set of a set.

Part C: Combinatorics. Basic counting formulas. Binomials. Inclusion-exclusion technique. Recursive definition and formulas.

Part D: Graph Theory. Graphs, examples, basic facts, vertex degrees, representing a graph, neighborhood matrices, connected components, Euler graphs, bipartite graphs, matching in bipartite graphs, Hall's marriage theorem, graph colorings.

[1] Information may change during the first two weeks of the term. Please consult the webpage for updates