AN INTRODUCTION TO DIMENSION THEORY

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Abstract. On the first part of this course we introduce the concept of the small inductive dimension for a topological space and naturally begin with zero-dimensional spaces. Then a number of classical theorems such as sum, product, addition, enlargement, coincidence, compactification and embedding theorems are presented in the realm of separable metric spaces. Also the universal spaces Nőbelling, Menger, and Sierpinski are investigated. On the second part we study the topological dimension outside the separable metric spaces and present the different definitions for it. Particularly, covering dimension and large inductive dimension will be compared and coincidence of them in metric spaces is established. On the third part we briefly study the infinite dimensional topology and give examples of countable and uncountable infinite dimensional spaces. We also provide some applications to other areas of general topology. Finally we wish to refer to some important aspects of the famous Erdős space in dimension theory and especially its crucial role in the concept of almost zero-dimensionality. The whole course is organized in three sessions each one nighty minutes. The first part of course takes the first two sessions and the remained parts are presented at the end one.

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