ON THE TOPOLOGY AND GEOMETRY OF $n$-NORMED SPACES

HENDRA GUNAWAN

In the series of five lectures, we shall discuss the topology and geometry of $n$-normed spaces. We begin with the concepts of $n$-inner products and $n$-norms for any $n \in \mathbb{N}$, which may be viewed as generalizations of the concepts of inner products and norms. The definition of $n$-inner products was originally formulated by Misiak [1, 2], while the notion of $n$-norms was developed by Gähler [3, 4, 5]. We shall discuss some results on $n$-inner product spaces and $n$-normed spaces, including the topology and the notion of orthogonality in $n$-normed spaces. Related to the $n$-inner product (and its deduced $n$-norm), we have the Cauchy-Schwarz inequality and accordingly the cosine of the angle between two $n$-dimensional subspaces intersecting on an $(n - 1)$-dimensional subspace. We are then interested in the formula for the angle between two subspaces (which may be of different dimensions) of an inner product space in general, as in [6, 7, 8].

The five lectures will be organized as follows:

1. Introduction: $n$-inner product spaces and $n$-normed spaces.
2. Topology in $n$-normed spaces
3. Orthogonality in $n$-normed spaces
4. Angles between two subspaces of a real inner product space - I
5. Angles between two subspaces of a real inner product space - II

References

Faculty of Mathematics and Natural Sciences, Bandung Institute of Technology, Bandung 40132, Indonesia
E-mail address: hgunawan@math.itb.ac.id