Functional Analysis I

1st week

Linear spaces, subspaces, basis and dimension of a linear space.

2nd week

Normed spaces, open and closed ball of a normed space. Open and closed sets of a normed space. Continuity of the norm and of addition/scalar multiplication. Convergent and Cauchy sequences. The definition of a Banach space. Examples of Banach spaces: $\mathbb{R}^n$, $C([a,b])$, l^p for $1 \leq p < \infty$.