Alternating links play an important role in knot theory and 3-manifold geometry and topology. Link invariants are often easier to compute and take on special forms for alternating links. The alternating tangle decomposition of a link diagram is a decomposition of the diagram into its maximally alternating regions. In this talk, we discuss the relationship between the signature of a link and its alternating tangle decomposition. (Received September 10, 2015)