# Introduction to K-theory and twisted K-theory

## (4 Lectures)

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K-theory refers to the study of class groups or K-groups of Mathematical objects. The subject was introduced by Grothendieck 50 years ago in his Riemann-Roch theorem in algebraic geometry. Since class in German is Klasse, the letter K was used. Over the last 50 years the subject has diversified in many directions, and the K-theory journal was started in 1987.

In our four meetings we will discuss the relation between the K-theory of vector bundles and the K-theory of projective modules. Using Principal bundles, we will consider in detail the K-theory arising from vector space bundles, matrix algebra bundles, and operaotor algebra bundles including the recent notion of twisted K-theory. Characteristic classes will be introduced from topological considerations and from an analytic point of view using connections for bundles on a manifold.