Title: Semigroups and Algebraic Geometry Codes

Author: Luciane Quoos.

Abstract: A linear code is a vector subspace of $\mathbb{F}_q^n$, wher $\mathbb{F}_q$ is a finite field with q elements. The family of linear error-correcting codes are specially important when one is attempting to transmit messages across a noisy communication channel. Data can be corrupted in transmission or storage by a variety of undesirable phenomenon, such as radio interference, electrical noise, scratch, etc.. It is useful to have a way to detect and correct such data corruption. An error correcting code can correct more errors larger is its minimum distance. This course aims to introduce a family of error correcting codes, the Algebraic Geometry Codes, and show how to use the theory of semigroups to improve the minimum distance of the code. This construction of codes make use of a function field in one variable over a finite field. We will show how the local information in one or two rational places, the knowledge of the semigroup in these places, can be used to improve the minimum distance of the code.