

Valery Alexeev - Fall 2009
Course Name : MATH8330 - TOPICS ALG GEOMETRY
Course Description : Cohomology of sheaves

The main aim of the course will be conceptual understanding and good working knowledge of sheaves on topological spaces and their cohomology.

Cohomology will be constructed both as Čech cohomology (which is specific to sheaves and/or local systems) and as derived functors (this construction is applicable to many other situations such as modules over a ring).

If there is interest, derived categories and spectral sequences will be covered as well.

With a sufficiently algebro-geometrically minded audience, the course will go more or less deeply into the topics important for algebraic geometry: Vanishing theorems of Grothendieck and Serre, Serre's duality theorem, Riemann-Roch theorem, Cohomology in families, Semicontinuity, Cohomology and base change, Vanishing theorems of Kodaira and Kawamata-Viehweg.