TOPICS IN TOPOLOGY
MATH 751
FALL 2018

Instructor: Bert Guillou
email: `bertguillou@uky.edu`
Office: 773 Patterson Office Tower

Course website: `http://www.ms.uky.edu/~guillou/F18/751.html`

The notion of vector bundle is a generalization of a covering space, in which the fibers are vector spaces rather than discrete spaces. These are of central importance in differential topology but also play an important role in algebraic geometry. We will study topological vector bundles.

Some topics to be covered include

Topics:
  (1) real and complex vector bundles,
  (2) constructions (Whitney sum, tensor product, etc.)
  (3) reduction of structure group
  (4) universal bundles and the classification of bundles
  (5) characteristic classes
  (6) $\mathbb{K}$-theory

Time permitting, we will discuss some applications to the stable homotopy groups of spheres.

Text: There is no *required* text for this course. We will draw largely from *Characteristic Classes*, by Milnor & Stasheff. Allen Hatcher's book-in-progress (available on his website) is also a good resource.

Homework: Homework exercises will be assigned occasionally to solidify the material in the lectures. You are **strongly** encouraged to work in groups on the homework, but you must write up your solutions independently.

The students will also occasionally break into small groups to work on problems together in class.

Prerequisites: MA 651. MA 654 recommended.