

The subject matter of the seminar is the theory of semi-simple algebras which are finite-dimensional over a field. Interesting examples are division algebras, i.e., non-commutative field extensions. Over the field \mathbb{R} , there is a unique such division algebra, the Hamilton quaternions. We will define the Brauer group of a field that can also be interpreted in terms of Galois cohomology. We will determine the Brauer groups of interesting fields, like \mathbb{R} , or \mathbb{F}_p , or \mathbb{Q}_p .

The prerequisites are:

- Basic concepts of Algebra, the tensor product.

The talks will be in English or Deutsch: the individual speaker can decide.

REFERENCES

- [B] N. Bourbaki, *Algèbre*, Ch. 8, Springer.
- [GS] P. Gille, T. Szamuely, *Central Simple Algebras and Galois Cohomology*, Cambridge University Press
- [Hu] T. Hungerford, *Algebra*, Springer Graduate Texts in Mathematics.
- [K] I. Kersten, *Brauergruppen von Körpern*, Vieweg-Verlag, 1990.
- [Lo] F. Lorenz, *Einführung in die Algebra II*, Spektrum Akad. Verlag (in English: *Algebra. Volume II: Fields with structure, algebras, and advanced topics*, Springer Universitext 2008).
- [Mi] J. Milne, *Class Field Theory*, see <http://www.jmilne.org/math/>
- [Sch] W. Scharlau, *Quadratic and Hermitian Forms*, Grundle. math. Wiss. **270**, Springer
- [Se] J.-P. Serre, *Corps locaux*, Hermann (in English: *Local Fields*, Springer Graduate Texts in Mathematics)