School of Mathematics

Course 448 — K-theory and Solitons   2008-09
(JS & SS Mathematics
SS Theoretical Physics)

Lecturer: Dr. Sergey Cherkis

Requirements/prerequisites:

Duration: 19 weeks

Number of lectures per week: 3

Assessment: Weekly homework assignments during 2009 contribute up to 10% of the final mark.

End-of-year Examination: 3-hour end of year exam

Description:

- Quick tour of Algebraic Topology
  Cell Complexes, Homotopy, Homology and cohomology, Spectral Sequences

- Vector Bundles and Associated Fiber Bundles

- Characteristic Classes

- Ring Structure of K(X)

- Bott Periodicity

- Division Algebras and Parallelizable Spheres

- Dirac Operator and its Index

See `http://www.maths.tcd.ie/~cherkis/448/` for further details.
Textbooks:

1. Hajime Sato, *Algebraic Topology: An Intuitive Approach*, Translations of Mathematical Monographs, Vol. 183 American Mathematical Society 1999 ISBN: 0-8218-1046-4

2. Allen Hatcher, *Vector Bundles and K-Theory*, (see `http://www.math.cornell.edu/~hatcher/VBKT/VBpage.html`).

March 31, 2009