Differential and algebraic topology: an introduction

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Abstract:

We will treat differential and algebraic topology on manifolds. In particular we will focus on the following fundamental techniques and stress their geometrical aspects :

1. Homotopy theory. Stable homotopy groups of spheres.
2. . Homology theory. Poincar duality.
3. Pontrjagin-Thom construction. Link between stable homotopy groups and cobordism groups.
4. Lefschetz theorem on fixed points of an isometry.
5. Finite group actions on manifolds and the theorem of G-index.

References:

1. A. Hatcher, *Algebraic topology,* (available on his web page)
2. R. Kirby , *The topology of 4-manifolds*, Lecture Notes in Mathematics 1374.