

MATH 465, SPRING 2011: ALGEBRAIC TOPOLOGY II

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The course will draw from some subset of the following provisional list of topics, based on participants' interests and background:

- Rational homotopy theory à la Quillen, Sullivan: DG Lie algebras and DG algebra models for rational homotopy types of simply-connected spaces. Simplicial sets, and the Maurer-Cartan space of a Lie algebra. Sullivan's minimal models. Massey products and formality. Model categories and Quillen equivalences. Koszul duality.
- Homological algebra and spectral sequences. Some subset of Serre, Eilenberg-Moore (a.k.a. Rothenberg-Steenrod), Atiyah-Hirzebruch, Adams, and Bousfield-Kan.
- Generalized cohomology theories. Spectra. Thom spectra. Cobordism theory. Complex oriented cohomology theories and formal groups. Real and complex K-theory. Morava K -theories. Elliptic genera and elliptic cohomology theories. Computations.

Prerequisites: Topology at the level of Math 460: homology, cohomology, manifolds, fiber bundles, and characteristic classes.