

Mathematics 581G

Autumn 2007

Instructor: John Palmieri, Padelford C-538, 543-1785, palmieri@math.washington.edu

Class time and place: MWF 2:30, Parrington 313

Office hours: drop in and by appointment

Web page: <http://www.math.washington.edu/~palmieri/Math581/>

Text book: There is no required book for the course. I'll use several myself: *Cohomology Operations and Applications in Homotopy Theory* by Mosher and Tangora, *Algebraic Topology* by Hatcher, *Algebraic Topology* by Spanier, and others. I'll provide references as I go along.

Homework: There may be occasional homework problems. Feel free to work with other people on the homework. If you find a solution in a book, please provide a reference.

Grading: To get a 4.0, attend class regularly and make a reasonable attempt on half of the homework problems. To get a grade in the range 3.6–3.9, do less than that. If you never show up and do less than a tenth of the homework, I might have to give you a lower grade than that.

Introduction: Steenrod operations have been an important part of homotopy theory for more than 50 years. They provide a refinement of the product structure on the cohomology ring of a space, and so can be used to detect more information than just the cohomology groups or the cohomology ring. For example, it is easy to use them to prove statements like the following: there is no topological space X whose mod 2 cohomology ring is isomorphic to $\mathbf{F}_2[x]$ with x in dimension 3.

Plan for the course: Plan? What plan?

Prerequisites: Algebraic topology: comfort with cohomology (singular, and perhaps cellular or simplicial) with field coefficients.