# Introduction to Spectral Sequences - Math 691.

Professor: Hal Sadofsky, Office: Fenton 215 (and 205), x6-4705.

Hours: M,W: 2-3. Note: I have a crazy schedule this term due to hiring so I may have to cancel office hours with little notice. Emailing ahead is the best guarantee that you'll find me and I'm happy to make appointments for other times.

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WWW: http://pages.uoregon.edu/sadofsky/691

Text: There is not good text for what I'm doing. The closest thing to a good textbook for a course like this one is parts of Frank Peterson's book *Cohomology Operations and Applications in Homotopy Theory* by Mosher and Tangora. But I'm not going to follow that book since it emphasizes developing the Adams Spectral Sequence which isn't my goal.

The best reference book for spectral sequences is John McCleary's *A User's Guide to Spectral Sequences* and I will refer to chapters from that book and try to follow his notation. But that is more of a catalog than a textbook.

Prerequisite: 600 topology. Some knowledge of homological algebra might be helpful, but I won't assume that and will develop what we need as we go along. You should know what I mean when I say "$M$ is a module over the commutative ring with unit $R$."

Workload: I will assign some homework (not every week) which you make work on collaboratively as long as you understand your work. I will also assign some reading out of McCleary's textbook. If possible I will give some in-class presentations as assignments.

Course Learning Goals: At the end of the class I'd like students to be able to calculate with (at least) the Serre spectral sequence and the Change-of-rings spectral sequence. Students should be able to construct the spectral sequence of a filtered chain complex and of a bicomplex and produce the associated unraveled exact couples. Given sufficient information about a spectral sequence, students should be able to make and prove appropriate statements about convergence.

Learing Environment: The University of Oregon strives for inclusive learning environments. Please notify me if the instruction or design of this course results in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.

Academic Conduct: The code of student conduct and community standards is at conduct.uoregon.edu. In this course, it is appropriate to help each other on homework as long as the work you are submitting is your own and you understand it. It is not appropriate to help each other on exams, to look at other students exams, or to bring unauthorized material to exams but then I don't actually expect to give exams, so that shouldn't come up.