

# TOPICS IN GEOMETRY

MATH-6490

SPRING 2009

**Instructor:** Dr. A. Raghuram.

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Office Hours: 10:30–11:30 a.m. on Tuesdays and 1:30–2:30 p.m. on Wednesdays.

**Course website:** <http://www.math.okstate.edu/~araghur/spring2009/math6490>

The weekly schedule of topics to be covered, lecture notes, and homework problem sets will be posted on this website.

**Textbook:** Lectures on Algebraic Geometry. I. By Günter Harder. Aspects of Mathematics, E35. Friedr. Vieweg & Sohn, Wiesbaden, 2008.

**Goals, Objectives and Prerequisites of Course:** This course is an introduction to sheaf theory. The primary emphasis will be on cohomology of sheaves. A secondary aim will be to learn techniques of homological algebra, like computing Ext and Tor functors, and the machinery of spectral sequences. Poincaré duality in the context of sheaves on manifolds will be ultimate aim of this course. I will be working through much of the first four chapters of the textbook.

The prerequisites are:

- (1) Algebra (Groups, rings, modules, vector spaces, linear algebra.) The first four chapters of Hungerford's Algebra (Springer Verlag, GTM 73).
- (2) Point set topology: The first chapter of Bredon's Topology and Geometry (Springer Verlag GTM 139).

I will (try to) review any result outside of these two references that I might happen to need.

**Homework:** Homework will be assigned every week. Every student should submit his/her solution to at least one problem each week.

**Exams:** There will be no exams in this course.

**Grading:** All students will be awarded an A, B or an F. Submitting (at least one problem per) homework for at least twelve weeks will guarantee an A. Submitting homework for at least six weeks will guarantee a B. (However, if you *really* care about what grade you will get then this course is not for you.)

**Attendance:** I will not be taking any attendance.

**Tips on doing well:** Work Hard and Be Happy!

**Students with disabilities:** Please read the paragraph on *Office of Student Disability Services* in the OSU syllabus attachment for Spring 2009.

**Classroom Etiquette:** I will expect a high level of academic decorum to be maintained in class. Everyone should treat each other's opinions and views with respect. Misconduct in class will not be tolerated. *Academic dishonesty is not condoned nor tolerated at Oklahoma State University.* Please read the section on *Academic Integrity Policy* in the OSU syllabus attachment for Spring 2009.

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*Teachers open the door. You enter by yourself. –Chinese Proverb.*