

## Course Information

Office: 266 Lockett Hall  
Phone: 578-7990  
E-mail: [pramod@math.lsu.edu](mailto:pramod@math.lsu.edu)  
Webpage: <http://www.math.lsu.edu/~pramod/>

**Textbook.** P. Tauvel and R.W.T. Yu, *Lie Algebras and Algebraic Groups*, Springer Monographs in Mathematics, Springer-Verlag, 2005. On campus, this book is available on-line from Springer at the following address: <http://www.springerlink.com/>.

**Course outline.** The main topic of the course is the structure theory of Lie algebras and algebraic groups over  $\mathbb{C}$ , based on chapters 18–30 of the textbook. We will proceed roughly according to the following schedule:

Root systems (Chap. 18)	2 weeks
Introduction to Lie algebras (Chap. 19–20)	3 weeks
Algebraic groups and their Lie algebras (Chap. 21–24)	3 weeks
Structure theory of algebraic groups (Chap. 25–28)	3 weeks
Structure and representations of Lie algebras (Chap. 29–30)	2 weeks

If there is time remaining at the end of the semester, we may cover additional topics such as nilpotent orbits, flag varieties, Bruhat decomposition, or the Borel–Weil–Bott theorem.

*Note.* The first half of the textbook is essentially a self-contained course on algebraic geometry over a field of characteristic 0. Although this course will only make a very minimal use of algebraic geometry, those of you going into algebra may find this part of the textbook to be a useful reference in the future.

**Homework & Grading.** Homework exercises will be due approximately once every two weeks. All the homework exercises will be posted on my webpage. I expect substantial efforts on each problem set, including some number of substantially correct solutions, but I do not expect perfect solutions to every problem, nor is it likely that every problem will be graded. The grade for the semester will be based on the number of problem sets submitted with substantial work:

- A Substantial work on all or all but one problem sets
- B Substantial work on more than half the problem sets, but missing at least two
- C Substantial work on more than one problem set, but fewer than half
- D Less than one problem set submitted
- F No work submitted

Under normal circumstances, I expect everyone to earn an ‘A’. If you feel that you are getting behind, please come see me as soon as possible.

**Exams.** There will be no timed exams. In lieu of a final exam, the last homework assignment will be due at the scheduled time for the final exam: Friday, December 10, 3:00pm.