

MATH 105: ALGEBRAIC NUMBER THEORY
FALL 2014

JOHN VOIGHT

COURSE INFO

- **Lectures:** Monday, Wednesday, Friday, block 12 (12:30–1:35 p.m.)
- **x-period:** Tuesday, 1:00–1:50 p.m.
- **Dates:** 15 September 2014–17 November 2014
- **Room:** 004 Kemeny
- **Instructor:** John Voight
- **Office:** Kemeny Hall, Room 341
- **E-mail:** jvoight@gmail.com
- **Instructor's Office Hours:** Wednesday and Thursday, 9:00–10:30 a.m., or just make an appointment!
- **Course Web Page:** <http://www.math.dartmouth.edu/~m105f14/>
- **Prerequisites:** One year of abstract algebra (groups, rings, fields) at the advanced undergraduate or graduate level.
- **Required Texts:** Jürgen Neukirch, *Algebraic number theory*, Grundlehren Math. Wiss., vol. 322, 1999.
- **Grading:** For undergraduates and graduate students in years 1 and 2, grade will be based on weekly homework.

HOMEWORK

The homework assignments will be assigned on a weekly basis and will be posted on the course webpage. Homework is required for undergraduates and graduate students in years 1 or 2; it is optional but strongly encouraged for anyone else. In general, it is due in one week, but late homework will be accepted.

Cooperation on homework is permitted (and encouraged), but if you work together, do not take any paper away with you—in other words, you can share your thoughts (say on a blackboard), but you have to walk away with only your understanding. In particular, you must write the solution up on your own.

Plagiarism, collusion, or other violations of the Academic Honor Principle, after consultation, will be referred to the The Committee on Standards.

RELIGIOUS OBSERVANCES AND ACCOMMODATION

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me before the end of the second week of the term to discuss appropriate accommodations.

I encourage students with disabilities, including “invisible” disabilities such as chronic diseases and learning disabilities, to discuss with me after class or during my office hours appropriate accommodations that might be helpful to you.

Students with disabilities enrolled in this course and who may need disability-related classroom accommodations are encouraged to make an appointment to see me before the end of the second

week of the term. All discussions will remain confidential, although the Student Accessibility Services office may be consulted to discuss appropriate implementation of any accommodation requested.

TOPICS

This course will be a graduate-level introduction to algebraic number theory, in which we will cover the fundamentals of the subject. Topics may include: rings of integers, Dedekind domains, factorization of prime ideals, Galois theory in number fields, geometry of numbers and Minkowski's theorem, finiteness of the class number, Dirichlet's unit theorem, selected topics from analytic number theory, quadratic and cyclotomic fields, localization and local rings, valuations (i.e. p -adic) and completions, an introduction to class field theory, application to Diophantine equations, and other topics as time permits.

A full schedule is available on the course webpage.