Introduction to algebraic number theory – Math 661
University of Hawai'i at Mānoa
Spring 2020

Meetings: TTh 1:30pm–2:45pm, Keller 402

Lecturer: Robert Harron Email: rharron *at* math.hawaii.edu
Office: Keller 407 Office Hours: Tues. 12:30pm–1:30pm, Thurs. 2:45pm–3:45pm

Course website: http://math.hawaii.edu/~rharron/teaching/math661s20/

Recommended textbook: Alaca and Williams' *Introductory algebraic number theory*

Other sources: I have never found a single algebraic number theory book completely to my liking. I've recommended Alaca and Williams' book because it contains *a lot* of worked out examples, as well as several chapters of background material. It however does not go as far as we will be going and does not cover the material in the order I'll be going. For the order, I mostly will follow Neukirch's *Algebraic number theory*, a very standard, thought quite terse, graduate text.

Some other books I'll take material from include Murty and Esmonde's *Problems in algebraic number theory* (a nice selection of worked out examples and useful results like Alaca and Williams), Milne's notes *Algebraic number theory* (available at www.jmilne.org/math/CourseNotes/ant.html), Fröhlich and Taylor's *Algebraic number theory*, Janusz's *Algebraic number fields*, and Narkiewicz's *Elementary and analytic theory of algebraic numbers*. Some well-known books I don't expect to use much: Marcus' *Number fields* and Lang's *Algebraic number theory*. Also, Keith Conrad actually has a lot of blurbs on algebraic number theory: http://www.math.uconn.edu/~kconrad/blurbs/.

Official description: Number fields and rings of integers; primes, factorization, and ramification theory; finiteness of the class group; Dirichlet's Unit Theorem; valuations, completions, and local fields. Further topics.

Assignments: Problems will be posted after each lecture, then bundled together and due at a specified time about every other week. Only a subset of the questions will be graded, though the rest will still be looked over. You need not type up your assignments in LaTeX (you are of course more than welcome to), but what you hand in should be neat and well-presented. Aside from the obvious consequence that I will be able to better read and understand what you are trying to say, it will also bring an added layer of critical thought to your work as writing up an argument you've already worked out encourages you to process those thoughts over again and can frequently advance your understanding.

Exams: There will be a take-home midterm and a take-home final.

Grading scheme:

Homework	60%	Midterm	20%	Final	20%