

Content: This is a first course in Algebraic Number Theory, focusing on algebraic number fields and their rings of integers. We will study factorisation into prime ideals, the class number, the unit theorem and Galois groups. Time permitting we will explore applications to Fermat's last theorem.

Assumed Knowledge: Math3962/Math4062 and Math2022, basic notions of modules over rings.

Weekly Schedule:

- Week 1: Basic commutative algebra.
- Week 2: Rings of integers of number fields, norms and traces.
- Week 3: Discrete valuation rings, Dedekind domains, factorisation of ideals.
- Week 4: Ramification, inertia, and splitting of prime ideals.
- Week 5: Finiteness of the class number.
- Week 6: Dirichlet L-functions.
- Week 7: The unit theorem.
- Week 8: Cyclotomic extensions.
- Week 9: Nonarchimedean absolute values. Product formula for places.
- Week 10: Completions and extensions
- Week 11: Global fields, Frobenius elements.
- Week 12: Galois groups of number fields.
- Week 13: Recap.