Oral Exam Syllabus

Surya Teja Gavva

- Analytic Number Theory
  - The Riemann zeta function and Dirichlet L-functions
  - Approximations to L-functions, Counting zeroes and Zero-free regions
  - Dirichlet Polynomials, Zero Density estimates
  - Exponential sums
  - Bilinear Forms and Large Sieve
  - Primes in Arithmetic Progressions
- Automorphic Forms
  - Harmonic Analysis on $\mathbb{H}$
  - Eisenstein series, Poincare series, cusp forms
  - Kloosterman sums
  - Spectral decomposition, Continuous and Discrete spectrum
  - Selberg Trace Formula
  - Fourier coefficients, Hecke operators
- Sieve Methods
  - Brun Sieve
  - Selberg's Sieve
  - Beta Sieve
  - Asymptotic Sieve
- Elliptic Curves
  - Elliptic Curves over $\mathbb{C}$
  - Elliptic Curves over Finite Fields
  - Weil bound, Stepanov's method
  - Elliptic Curves over Global Fields
  - Integral Points on Elliptic Curves