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Plan

Lecture 1: Overview

Part I: Elliptic curves and abelian varieties

Lectures 2, 3, 4: Elliptic curves and abelian varieties over fields

Lectures 5, 6, 7: Group schemes, over fields and DVRs, including Raynaud's theorem

Lectures 8, 9: Abelian varieties in mixed characteristic, including Néron models

Lecture 10: Jacobians

Lecture 11: Criterion for rank 0 (Theorem B from [Lecture 1](#))

Part II: Moduli of elliptic curves

Lectures 12, 13, 14: Modular curves

Lecture 15, 16: Modular forms and the Hecke algebra

Lecture 17: The Eichler–Shimura theorem

Lectures 18, 19: Criterion for non-existence of torsion (Theorem A from [Lecture 1](#))

Part III: Proof of Mazur's theorem

Lecture 20: The Eisenstein ideal and Eisenstein quotient of $J_0(N)$

Lecture 21, 22: The special fiber at N of $J_0(N)$

Lecture 23: Ogg's theorem on the order of $[\infty] - [0]$ in $J_0(N)$

Lectures 24, 25, 26, 27: TBA