Spring 2024, Algebra 0

	Tuesdays	Fridays
Week 1	Linear transformations: Injectivity, surjectivity, composition.	Invertibility; Vector spaces.
Week 2	Basis of vector spaces.	Construction of vector spaces; Determinants.
Week 3	Diagonalization.	Jordan normal form.
Week 4	Inner product space; Orthogonal matrices.	Isometry groups; Rotation groups. Monodromy representations.
Week 5	Orthogonal projection; Symmetric matrices.	Quadratic forms; Conway's topograph.
Week 6	Spectral theorem of compact self-adjoint operators.	Rings; PID are UFD.
Week 7	Gaussian integers; Sum of two squares.	Fields; Algebraic closure.
Week 8	Quadratic residues; Ax-Grothendieck theorem.	Knot invariants; TQFT; Categorifications.
Week 9	Midterm exam.	Mobius transformations.
Week 10	Holiday	Holiday
Week 11	Cross ratios; Mobius transformations on H; Hyperbolic metric.	Complex torus and Elliptic curves: Intro.
Week 12	Background on complex analysis (I).	Background on complex analysis (II).
Week 13	Elliptic functions and modular forms (I).	Elliptic functions and modular forms (II).
Week 14	Representations of quivers (I).	Representations of quivers (II).
Week 15	Optional topics.	Optional topics.
Week 16	Review of final exam.	Final Exam.

Topics in blue text are optional, and will not be tested in the exams.