

**MAT1312S**  
**Topology and Geometry of Torus Actions and Related**  
**Combinatorics**

Instructors: Lisa Jeffrey (until February 17)

Mikiya Masuda (after February 18)

Topics:

- (1) Background for group actions on topological spaces
- (2) Hamiltonian group actions
- (3) Actions of discrete groups on topological spaces
- (4) Actions of tori (compact connected abelian groups) on smooth manifolds
- (5) Fixed point set of a group action
- (6) Action of a group on the tangent space at a fixed point
- (7) Equivariant cohomology
- (8) Equivariant characteristic classes

**Evaluation:**

For students taking the course for credit:

Assignments 50%

Presentation 50%

This should be in April and should cover one topic in detail. It should last 30 minutes.

**Textbooks:**

- (1) M. Audin, *The Topology of Torus Actions on Symplectic Manifolds*. Birkhäuser (Progress in Mathematics), 2004.
- (2) S. Dwivedi, J. Herman, L. Jeffrey, T. van den Hurk, *Hamiltonian Group Actions and Equivariant Homology*, Springer, 2019 (Springer Briefs), Chaps. 8 and 9.
- (3) V. Guillemin, *Moment Maps and Combinatorial Invariants of Hamiltonian  $T^n$ -spaces*, Birkhäuser (Progress in Mathematics), 1998.