

Symplectic Topology (24)

Non-Examinable (Graduate Level)

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This course is intended as a graduate level introduction to modern symplectic topology with a view towards Floer-theoretic techniques. Topics will include:

- Basics of symplectic topology: symplectic linear algebra, neighborhood theorems, Lagrangian submanifolds, symplectomorphisms.
- Constructions of symplectic manifolds: symplectic blow-ups, Lefschetz pencils.
- Moduli spaces of pseudo-holomorphic curves, Gromov-Witten invariants.
- Quantum cohomology, Hamiltonian Floer theory, Lagrangian Floer theory.
- Time permitting: construction of the Fukaya category.

Prerequisites

Knowledge of algebraic topology and differential geometry will be essential.

Literature

1. Auroux, D. *A Beginner's Introduction to Fukaya Categories*. Available at <https://arxiv.org/pdf/1301.7056>.
2. McDuff, D and Salamon, D. *Introduction to Symplectic Topology (3rd Edition)*. Oxford Univ. Press, 2017.
3. McDuff, D and Salamon, D. *J-holomorphic Curves and Symplectic Topology*, AMS Colloquium Publ. 52, AMS, 2004.
4. Smith, I. *A Symplectic Prolegomenon*. Available at <https://arxiv.org/pdf/1401.0269>.