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## INTRODUCTION TO MODULI SPACES OF FLAT CONNECTIONS

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### Course Content

This is an introductory course on moduli spaces of flat connections. The material to be covered will be selected from the following:

1. Overview, Yang-Mills equations
2. Connections on principal bundles, curvature, gauge transformations, moduli space of flat connections (Atiyah-Bott)
3. Connections on vector bundles, stability conditions, moduli space of semi-stable holomorphic structures
4. Holonomy, character variety
5. Yang-Mills connections, Morse theory, and the topology of the moduli space of flat connections (Atiyah-Bott)
6. Hitchin's equations and the moduli space of solutions to Hitchin's equations
7. Morse theory and the topology of Hitchin's moduli spaces
8. Symplectic geometry of the moduli space: infinite-dimensional and finite-dimensional constructions