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# Lecture

## An introduction to Schubert calculus and its equivariant and quantum generalisations

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**Abstract:** In classical algebraic geometry, Schubert calculus is the study of the intersection theory of a special kind of subvarieties of Grassmannians called Schubert varieties. It stems from counting problems in algebraic geometry and has rich connections with combinatorics, representation theory and mathematical physics. These lectures are intended to be an introduction to the subject, and its generalisations in equivariant and quantum contexts. We will try to cover most of the following topics:

1. Schubert cells and varieties, cohomology of Grassmannians, some counting problems, and some computational rules
2. Equivariant cohomology of Grassmannians, GKM theory, positivity, puzzle rules
3. Quantum cohomology of Grassmannians, principle of 'quantum=classical'
4. Equivariant quantum cohomology of Grassmannians

### Lecture 1

Date: 26 January 2016 (Tuesday)

Time: 10:30 a.m. – 12:00 noon

Venue: Room 219, Lady Shaw Building, The Chinese University of Hong Kong

### Lecture 2

Date: 28 January 2016 (Thursday)

Time: 10:30 a.m. – 12:00 noon

Venue: Room 222, Lady Shaw Building, The Chinese University of Hong Kong

### Lecture 3

Date: 2 February 2016 (Tuesday)

Time: 10:30 a.m. – 12:00 noon

Venue: Room 219, Lady Shaw Building, The Chinese University of Hong Kong

### Lecture 4 (Time permitting)

Date: 4 February 2016 (Thursday)

Time: 10:30 a.m. – 12:00 noon

Venue: Rm 222, Lady Shaw Building, The Chinese University of Hong Kong, Shatin

*All are Welcome!*