

DEPARTAMENTO DE MATEMÁTICAS

OFRECIMIENTOS DE CURSOS

2017-10

<p>Nivel del Curso</p> <p>4: posgrado _x_</p> <p>3: final de carrera _x_</p> <p>2: mitad de carrera ___</p> <p>1: inicio de carrera ___</p>	<p>Nombre completo del curso en español:</p> <p>Grupos de Lie</p>
	<p>Nombre completo del curso en inglés:</p> <p>Lie groups</p>
	<p>Nombre abreviado en español (Máx. 30 caracteres contando espacios)</p> <p>Lie groups</p>
	<p>Profesor: Mitsuru Wilson</p>
<p>Descripción del curso en español:</p>	
<p>Descripción del curso en inglés:</p> <p>A Lie group is a group or a symmetry with an underlying smooth structure, which gives rise to one of the most mesmerizing theories in mathematics. The Norwegian mathematician S. Lie initiated the study of continuous symmetry, and applied it to his theory of integration of differential equations and transformation groups, etc. This study is now called Lie theory. In our course we will start from a review of differential geometry and the foundational aspects of Lie theory, such as the differential geometry of Lie groups, Lie algebra, exponential maps and the relationships between a Lie group and its associated Lie algebra. We will prove profound theorems like Ado's theorem, Lie's three theorems and Cartan's theorem. After covering the foundations, we will move onto the study of Lie group actions on Lie groups, or manifolds to study their symmetries, representation theory of a Lie group to reveal their structures. By focusing on (but not restricted to) compact Lie groups, we will prove many interesting structural theorems, applications, compute representations of specific Lie groups, and work with examples of Lie group actions that may appear in other places of mathematics and physics. Towards the end of the course, each student will get an advanced topic for an in-class presentation.</p>	
<p>Prerrequisitos:</p> <p>Geometría Diferencial, Álgebra Abstracta 1.</p>	

Formato Ofrecimiento de Cursos
201710

Objetivos:

The aim of this course is to introduce the basic theory of Lie groups, Lie algebras, and the foundations of the theory of representations of Lie groups. The main focus will be put on compact Lie groups.

Contenido:

- 1 • Lie groups and Lie algebras.
- 2 • The exponential map.
- 3 • Lie subgroups and homomorphisms.
- 4 • Lie's theorems
- 5 • Lie group actions and representations.

Forma de Evaluación:

Seven biweekly assignments (50%), Participation (15%) and Oral presentation (35%).

Bibliografía:

Duistermaat, J.J. and Kolk, J.A.C. Lie groups. Universitext. Springer-Verlag, Berlin, 2000.

Hall, B. Lie Groups, Lie Algebras, and Representations, Springer-Verlag, 2003.

Mark R. Sepanski. Compact Lie Groups. Graduate Texts in Mathematics. Springer, 2007.