



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Metodi Matematici della Fisica

2324-1-F1701Q098

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#### Aims

Group theory and its applications to theoretical physics.

#### Contents

Lie groups, Lie algebras; their representations.

#### Detailed program

- Definition of group; subgroups, homomorphisms, representations.
- Finite groups. Lie groups. Lie algebras. Examples of Lie groups: orthogonal, unitary, Lorentz, Poincaré.
- Classification of Lie algebras. Semisimple algebras. Root systems. Dynkin diagrams. Classification of representations.

#### Prerequisites

Undergraduate degree in math or physics

## Teaching form

Lessons (6 CFU), This course will be taught in English.

*During the Covid-19 emergency the lectures will be delivered in streaming on the Webex platform. They will be recorded and will appear on the e-learning page on the scheduled day.*

## Textbook and teaching resource

Group Theory:

Wu-Ki Tung, *Group Theory in Physics*

Georgi, *Lie Algebras in Particle Physics*.

Fulton-Harris, *Representation theory*, Springer.

Gilmore, *Lie Groups Lie Algebras and some of their applications*, Dover.

Gilmore, *Lie Groups, Physics and Geometry*, Cambridge.

Cornwell, *Group Theory in Physics*, Academic Press.

Other books (some available as pdf on the [library webpage](#)) :

## Semester

First semester

## Assessment method

Oral exam. Open questions on the course's topics.

*During the Covid-19 emergency exams will be online. Dates and instructions to participate as spectators will be posted on the e-learning page.*

## Office hours

By appointment, by sending an e-mail to [mattia.bruno@unimib.it](mailto:mattia.bruno@unimib.it)

## Sustainable Development Goals

QUALITY EDUCATION

