

Introduction to group theory (Introduzione alla teoria dei gruppi)
A. Lucchini
University of Padova, Italy
Faculty of di Mathematics, Physics and Natural Sciences
Mathematics Second Level Course

It is open to students of the **Master's degree in Mathematics (Laurea Specialistica)**, and to students of the **Master Mundus ALGANT program**.

When: third trimester

Where: Department of Pure and Applied Maths, Padova.

Total number of hours: about 64 (8 credits).

Examination: oral. The candidate will be asked to present the most important arguments presented in the course, proving the more significant results and solving some related exercise.

Description of the course

We will give a general introduction to the theory of group, describing methods and results. In the second part of the course we will concentrate on particular topics (for example profinite groups).

Program

General introduction to group theory: actions of groups, solvable and nilpotent groups, finitely presented groups. A short history of the classification of finite simple groups. Topological groups, profinite groups (characterizations, profinite completion, countable based profinite groups, arithmetical properties, subgroups of finite index in profinite groups, Galois groups of infinite dimensional extension). Probabilistic methods in group theory.

References

- I.M. Isaacs, *Finite Group Theory*, American Mathematical Society, 2008.
J. Wilson, *Profinite Groups*, London Math. Soc. Monographs 19, Clarendon Press, 1998.
L. Ribes & P. Zalesskii, *Profinite groups*, Ergebnisse der Mathematik (3) 40, Springer, 2000.
A. Lubotzki & D. Segal, *Subgroup growth*, Progress in Math. 212, Birkhäuser, 2003.