

Department of Mathematics, University of Tennessee at Knoxville
MATH662–Introduction to Geometric Group Theory
Spring 2024

Lectures

Meeting time Tuesdays and Thursdays 11:20-12:35pm
Classroom TBD

Instructor

Instructor Yulan Qing
Email yqing@utk.edu
Office Ayres Hall 225A
Office Hours Thursdays 2-4 and by appointment

Office Hours: If you would like to book an appointment outside my regularly scheduled office hours, please send me an email indicating the times you are available to meet. Also, please give at least 24 hours notice for appointments so that there is suitable time to make arrangements.

Course Description

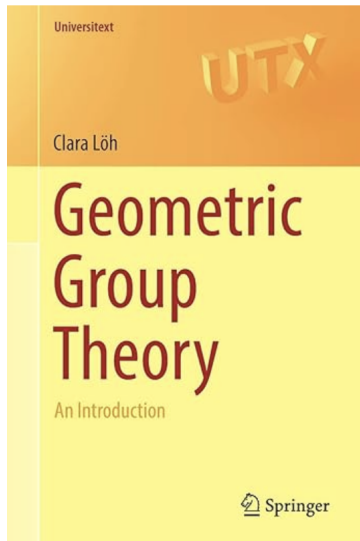
Geometric group theory stems from a series of intuitive but seminal ideas relating group theory and coarse geometry. After several decades of fast and fruitful development, it now lies at the intersection of group theory, metric geometry, topology, complex analysis and dynamical systems. The aim of this course is to introduce the fundamental concepts and methods and discuss how they help to solve the classic problems in the field.

We aim to cover group presentation, Cayley graphs, quasi-isometry, free groups, group actions on trees, hyperbolic groups and boundaries. If times allows we will discuss mapping class groups and CAT(0) groups.

The course assumes undergraduate level group theory and basic point-set topology. Some familiarity with fundamental groups and covering spaces would be a helpful though not essential prerequisite.

Please note that MATH661 is NOT a prerequisite for this course.

Reference Material



Geometric Group Theory: An Introduction (Universitext) 1st ed. 2017 Edition
by Clara Löh (Author)

Publisher: Springer; 1st ed. 2017 edition (January 19, 2018)

Language: English

Paperback: 400 pages

ISBN-10: 3319722530

ISBN-13: 978-3319722535

Other Important reading material will be handed out in class.

Course Components

Lectures

You will get the most out of lectures if you come ready to engage with the material as opposed to just taking notes (or not). Try to make sense of individual topics and their connections to other topics and how to translate seemingly abstract concepts into simple terms.

Presentations

Each student will give a short presentation at the end of the semester. You are encouraged to choose a topic that interest you and read further and share with the class what you learn. Be creative and be engaging. Think of it as telling a story. Audio-visual equipment is provided if needed.

Summary of presentations

Each student will hand in a summary of 2-3 presentations that are presented by other students. In particular, the document should address the following:

1. What is a main concept in this presentation?
2. What are the examples and non-examples related to this concept.
3. Do you have any questions for the presenter?

Accessibility Needs

The University of Tennessee is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible.

Academic Integrity

Academic integrity is fundamental to learning and scholarship at the University of Tennessee. Please participating honestly, respectfully, responsibly, and fairly in this academic community. Familiarize yourself with the University's policy on related issues and codes of conduct. A case of academic misconduct is treated seriously.