Math 235b - Reflection Groups
Spring 2015

Instructor: Anna Lachowska, 404 DL.
Class schedule: T Th 1:00-2:15pm, LOM 205.

1. Brief Description

A link between linear algebra and abstract algebra, in particular group theory, Lie algebras and representation theory. Topics include: Orthogonal transformations and reflections in a real Euclidean space, groups generated by reflections, Coxeter groups, crystallographic groups, classification of finite Coxeter groups.

2. Text

C.T.Benson, L.C.Grove, *Finite Reflection Groups*, Second Edition, Springer, 2010.

3. Syllabus

week	reading	topic
Jan 12-16	2.1- 2.2	Orthogonal transformations in 2 dimensions
Jan 19-23	1.1 - 1.2	Basics of group theory
Jan 26 - Jan 30	2.3 - 2.4	Orthogonal transformations in 3 dimensions
Feb 2 - 6	2.5 - 2.6	Finite groups in 3 dimensions
Feb 9 - 13	3.1	Fundamental regions
Feb 16 - 20	4.1	Coxeter groups, root systems
Feb 23 - Feb 27	4.2	Fundamental regions for Coxeter groups
Mar 2 - 8	5.1	Coxeter graphs
Mar 23 - 27	5.2	Classification of the finite root systems
Mar 30 - Apr 3	5.3	Construction of Coxeter groups
Apr 6 -10	5.4	Order of irreducible Coxeter groups
Apr 13 - 17	6.1	Generators and relations for Coxeter groups
Apr 20 - 24		Applications and review

4. Evaluation

Homework - 30%, Midterm - 30%, Final - 40%.