Mathematics 996, Spring 2019 (Section #75774)
Topics in Algebraic Combinatorics – Coxeter Groups

Lectures: MWF 10:00–10:50am, 302 Snow Hall

Instructor: Prof. Jeremy Martin (you can call me "Jeremy")
Contact info: `jlmartin@ku.edu` (preferred) or (785) 864-7114
Office: 618 Snow Hall
Office hours: Fridays, 2–4pm, or by appointment

Website: Most course material will be at `http://jlmartin.faculty.ku.edu/math996`. There is also a Blackboard site for materials that are not to be distributed publicly, including my lecture notes.

Course description: This course will focus on Coxeter groups and their connections with research topics of current interest in combinatorics.

E-mail: I will periodically send class information to all students' KU e-mail accounts. You are responsible for checking your e-mail regularly so as to receive this information.

Prerequisites: Math 791 (possibly taken concurrently) or permission of the instructor. Some knowledge of combinatorics (Math 724 or Math 824) will be helpful, but I will try to make this course as self-contained as possible.

Textbooks and other resources: The main textbook is Anders Björner and Francesco Brenti, *Combinatorics of Coxeter Groups* (Springer, Graduate Texts in Mathematics #231, 2005). We will cover chapters 1–3 and some subset of $\{4, 7, 8\}$, together with some material not in the text. You can access the full text of the book electronically via a link from the course website.

Other useful books and notes: Links to free online versions are given where available.

- William Fulton, *Young Tableaux* (Cambridge, 1997). A good reference for representations of the symmetric group, and the geometry of Grassmannian, flag and Schubert varieties.
- James Humphreys, *Reflection Groups and Coxeter Groups* (Cambridge, 1990). The long-time standard text on Coxeter groups; the approach is more geometric and less combinatorial than Björner and Brenti's book.
- Richard Stanley, *Enumerative Combinatorics*, volumes 1 and 2 (Cambridge, 1997/1999). The canonical reference on all things combinatorial. The second edition of Volume 1 (Cambridge, 2011) is available from Stanley's website.
- Richard Stanley, *Hyperplane Arrangements*
- My own lecture notes on algebraic combinatorics.

Course requirements: Each student will carry out an individual project, consisting of reading a research article or the equivalent (I will provide a list of suggested articles), giving a brief expository talk to the class. Each student will also provide formal peer feedback for another student's presentation. There will be no official homework or exams. Some presentations may take place during the scheduled exam time (Monday, May 13, 7:30–10:00am).

Blatant shill: Please attend the Combinatorics Seminar (Fridays, 4–5pm, Snow 408). Please also volunteer to give a talk.

Academic honesty and collaboration: You are required to abide by all KU policies on academic integrity. Cheating, plagiarism or other academic misconduct will result in formal disciplinary charges and sanctions. Refer to the official KU policies on academic misconduct for more information.

Disability accommodations: Student Access Services (22 Strong Hall; `access.ku.edu`; 785-864-2620 V/TTY) coordinates accommodations and services for all students who are eligible. If you have a disability for which you wish to request accommodations, please contact SAS as soon as possible. Please also contact me privately in regard to your needs in this course.

Religious accommodations: If you know that a scheduled assignment will conflict with a mandated religious observance, please contact me in advance to make appropriate arrangements.

Intellectual property: Course materials prepared by the instructor, together with the content of all lectures and review sessions, are the intellectual property of the instructor. Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. Upon reasonable request, the instructor will usually grant permission to record lectures, on the condition that such recording is used only as a study aid by the student making the recording, and is not modified or distributed in any way. Course materials posted online are intended for the personal use of students in the class and must not be redistributed without the instructor's consent.

Commercial note-taking ventures: Pursuant to KU's Policy on Commercial Note-Taking Ventures, commercial note-taking is not permitted in Math 996. Lecture notes and course materials may be taken for personal use, for the purpose of mastering the course material, and may not be sold to any person or entity in any form. Any student engaged in or contributing to the commercial exchange of notes or course materials will be subject to discipline, including academic misconduct charges, in accordance with University policy. Note-taking provided by a student volunteer for a student with a disability, as a reasonable accommodation under the ADA, is *not* the same as commercial note-taking and is not covered under this policy.

Weapons policy: Individuals who choose to carry concealed handguns are solely responsible for doing so in a safe and secure manner and in strict conformity with state and federal laws and KU weapons policy. Safety measures outlined in the KU weapons policy specify that a concealed handgun:

- Must be under the constant control of the carrier.
- Must be out of view, concealed either on the body of the carrier, or backpack, purse, or bag that remains under the carrier's custody and control.
- Must be in a holster that covers the trigger area and secures any external hammer in an un-cocked position
- Must have the safety on, and have no round in the chamber.

Updated Fri 1/25/19