Math 582 G – Convex Algebraic Geometry – Winter 2022

Lecture: MWF 3-3:50pm in PDL C-401 (first week on zoom)

Instructor: Cynthia Vinzant (`vinzant@uw.edu`, PDL C-526)

Instructor Office Hours: by appointment

Textbook: There will be no assigned textbook for this course. Notes and additional references will be posted on the course website.

Course website: `http://sites.math.washington.edu/~vinzant/teaching/582G/`

Prerequisites: The only prerequisite is a solid background in linear algebra. Some familiarity with concepts from convexity and algebra will be helpful but is not required.

Course Description: Convex algebraic geometry involves the study of convex objects defined by real polynomial inequalities using the interplay of their convex and algebraic structure, with a special emphasis on those appearing in convex optimization. This class will introduce basic notions and techniques in real algebraic geometry, convexity, and conic optimization. Topics include semidefinite programming, sums of squares, moment problems, hyperbolic and stable polynomials, and applications in combinatorics and optimization.

Grading: This is a topics course so the grade will be determined by involvement and participation. Problems will be suggested and students will be encouraged to attempt them. The grade will be based on students participation.

Academic Integrity: The University takes academic integrity very seriously. Behaving with integrity is part of our responsibility to our shared learning community. If you are uncertain about if something is academic misconduct, ask me. Acts of academic misconduct may include but are not limited to cheating (working collaboratively on assignments/exams and discussion submissions, sharing answers and previewing exams) plagiarism (representing the work of others as your own without giving appropriate credit) and unauthorized collaboration (working with each other on assignments). Concerns about these or other behaviors prohibited by the Student Conduct Code will be referred for investigation and adjudication by (include information for specific campus office). Students found to have engaged in academic misconduct may receive a zero on the assignment (or other possible outcome).

Face Coverings in the Classroom: The health and safety of the University of Washington community are the institution's priorities. Please review and adhere to the UW COVID Face Covering Policy.

Access and Accommodations: Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course.

If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or `uwdrs@uw.edu` or disability.uw.edu. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

Religious Accommodations: Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form.