

A&S 153 — Polyhedra: Three-Dimensional Mathematical Structures
MW 4:00–5:15 — FB213
(But sometimes we will meet in the computer lab in CB313)

INSTRUCTOR: Carl Lee, 967 POT, 257-1405, lee@ms.uky.edu, <http://www.ms.uky.edu/~lee>.

OFFICE HOURS: MWF 11:00–11:50 and by appointment, since I realize that some of you will be unable to come at these times.

TEXTS: Cromwell, *Polyhedra*, and Holden, *Shapes, Space, and Symmetry*.

TOPICS: Interest in three-dimensional polyhedral structures (such as cubes, pyramids and more complicated shapes) extends back thousands of years. Euclid's *Elements*, the foundational work on axiomatic geometry, devotes its final chapter to the construction of the five Platonic solids. We presently encounter polyhedra in such realms as crystallography, computer graphics, architecture, puzzles, operations research and art. In this seminar we will study several specific properties of polyhedra, including symmetry, facial structure, rigidity and decomposability. In so doing, we will examine some episodes in history, construct a variety of physical and computer models, create puzzles, make conjectures, solve problems and prove theorems.

HOMEWORK AND PROJECTS: Most of what we do will be oriented around projects, some of which may last a week, a month, or longer. Homework may consist of reading assignments, problems to solve, and structures to build, among other things, and your grade will be determined by my assessment of these projects. I am hoping that by the end of the semester we will have enough items for a public display. You should plan to keep some sort of notebook, in which you keep track of classroom material and homework, as well as your thoughts, reflections, conjectures, solutions, that you do outside of the classroom. I suggest a three-ring binder for ease in arranging and adding material. Your grade in the course will be determined by my assessment of all aspects of your work in this course.

IMPORTANT DATES:

Wednesday, August 23, First day of classes

Tuesday, August 29, Last day to add a class

Monday, September 4, Labor Day holiday—no class

Wednesday, September 13, Last day to drop a class without a grade

Friday, October 6, October break—no class
Monday, October 16, Middle of the fall semester
Friday, October 20, Last day to withdraw from a class
Tuesday, November 7, Presidential election—no class
Thursday–Saturday, November 23–25, Thanksgiving holiday—no class
Friday, December 8, Last day of classes

CHEATING AND PLAGIARISM: The *minimum University penalty* for cheating and/or plagiarism is *a grade of E for the entire course*. It's not worth it and it is damaging to your self-integrity, so don't do it.