Math 563H: Honors Differential Geometry of Curves & Surfaces
Spring 2021: Mondays & Wednesdays, 2:30–3:45

Professor: Rob Kusner [via Zoom and email during the pandemic]
E-mail: `profkusner@gmail.com` [Zoom links to be emailed before class]
Website: `www.gang.umass.edu/~kusner/class/classes.html`
Office hours: right after class and by appointment [via Zoom]

The text, *Curves and Surfaces (second edition)* by Sebastian Montiel and Antonio Ros, emphasizes natural, global geometric results (especially variational problems, leading to the theory of minimal and constant mean curvature surfaces, to which UMass mathematicians have made major contributions). We'll draw topics from the text, but not follow it slavishly; topics from Manfredo do Carmo's *Differential Geometry of Curves and Surfaces*, and others not covered in the text (like the calculus of differential forms and its application to the intrinsic geometry of surfaces, nicely treated in Barrett O'Neill's classic *Elementary Differential Geometry*) are also fair game!

On my webpage `www.gang.umass.edu/~kusner/class/563hw` (updated as the semester progresses) you can find an outline and schedule of topics, the problems to think about or turn in, hints for these problems, and commentary on the cosmic significance of what we are doing.

Class attendance (via Zoom, your with audio and video ON please ;-) is encouraged, even though the course is officially synchronous-optional. We'll supplement with our own short videos (on YouTube) and student-hosted evening Zoom parties later in the semester (as you prepare final projects).

Homework will be submitted (electronically as a .pdf file, preferably prepared using mathematical typesetting software, like a flavor of *TeX*) weekly, graded and discussed with you individually (via Zoom). The final will be a research project in which you make a video presentation (posted to YouTube), a written report (submitted just like the homework), and possibly a short oral exam (via Zoom).

Meeting deadlines is essential. No late homework will be accepted, so we'll try to keep the workload reasonable. Please submit your best efforts, even if you haven't resolved every detail of each problem.

Grading will be based in (roughly) equal parts on the homework and the final research project/presentation/exam.