

MATH 462- DIFFERENTIAL GEOMETRY-FALL 2007

Goal and prerequisites: This is an introductory *undergraduate* course on differential geometry, being offered at UTK for the first time. The only prerequisites are multivariable calculus and linear algebra (*not* necessarily the honors versions; advanced calculus/analysis and topology are not required.) The intended audience includes both mathematics majors and anyone interested in learning basic geometry of surfaces for applications (e.g. in engineering, computer graphics or physics), in the language currently used in mathematics. For mathematics majors and *beginning* graduate students (in math or another field) with no geometry in their background, the course is meant to bridge the gap between basic calculus and graduate-level Riemannian geometry (in particular, concepts such as *differential form*, *moving frame*, *manifold*, *connection*, *curvature* and *geodesics* will be introduced, in the simple setting of surfaces in three-dimensional space.)

Remark: to avoid pain and suffering, your multivariable calculus/linear algebra should be up-to-date; a grade C on one of these subjects should be viewed as a negative indicator for students considering the course.

Text: *Elementary Differential Geometry*, by Barrett O'Neill (Academic Press, 2nd edition, 1997; second printing, 2006). For a more precise idea of the course, please look up the table of contents on the amazon.com page for the book (and, for fun and encouragement, the reader reviews). The plan right now is to cover chapters 1-7. Depending on student interest, there may be an *optional* computer component, based on Maple (as introduced in the text).

Grading: based on homework sets, a project, two exams and a final.

Time: Tuesday & Thursday, 2:10-3:25