

Classical Differential Geometry, Math 424, Term II 2014

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Textbook: Curves and Surfaces, 2nd Ed, S. Montiel and A. Ros

Pre-requisites: Multivariable calculus, linear algebra

Time and Location: Tue and Thu, 2:00 p.m. - 3:30 p.m., Buchanan
B304

Course work: There will be regular homework and a take-home exam.

Topics: The course is on differential geometry of curves and surfaces in \mathbb{R}^3 , with emphasis on surface theory. We will introduce some basic concepts, such as curvature of curves, the tangent plane and differential of maps, differential forms, the first and the second fundamental forms, Gauss curvature and the mean curvature of surfaces, Gauss map and vector fields. We will study Gauss' Theorema Egregium and the Gauss-Bonnet Theorem. If we have time, we will discuss Minkowski formulas and the Alexandrov theorem.