McGill University Department of Mathematics and Statistics

MATH 222 (Calculus III) Course Outline — Summer 2008

Caveat: Classroom attendance and taking notes in class are important. The lectures will not follow exactly what is written in the textbook. Your classroom notes will be of essential help for the preparation of the midterm and final examinations.

Course Outline:

(1) *Infinite Series.* Infinite sequences and series. Testing convergence and divergence of series. Power series and their use for representing functions. Taylor polynomials and Taylor series. Approximately 4 lectures of the course.

(2) Vector Functions. Review of parametric equations and polar coordinates. Review of vector geometry. Derivatives and integrals of vector functions; arc length and curvature of space curves. Motion in space: velocity and acceleration; Keplers laws of planetary motion. Approximately 4 lectures of the course.

(3) Partial Derivatives. Functions of several variables and their partial derivatives. Tangent planes. The chain rule. Directional derivatives and gradient vectors. Maximal and minimal values; Lagrange multipliers. Approximately 5 lectures of the course.

(4) *Multiple Integrals.* Double (and triple, if time permits) integrals with applications. Change of variables in multiple integrals. Approximately 4 lectures of the course.