ıth 110. Applications of Calculus (proposed new title), Spring 1997

ɛxt: Alexander J. Hahn, Learning Basic Calculus: From Archimedes to Newton to its Role in Science, to appear in Springer-Verlag, to appear Summer 1997.

›pics (selected from Chapters 9-12) :

Review of essentials from differential calculus (critical points, ıcreasing and decreasing functions, maxima and minima, anti-derivatives). ısics about vectors, forces, and tensions (all in the plane). The pulley :oblem from L'Hospital's calculus text (solved by the methods of calculus ıd again by the method of balancing forces). The Suspension Bridge as a :oblem of statics.

Review of the exponential and logarithm function. Elementary ıclear physics, the experiments of Rutherford, and the mathematics of ıdio-activity. Mathematical analysis of the rubidium-strontium clock, the ›tassium argon clock, the carbon-14 clock, and the variety of information ıat they provide. Essential microbiology and the growth of microbes; ·coli and the logistics model.

Review of interest, compound interest, income streams, inflation. ɛmand and supply functions, elasticity. Analysis of the OPEC experience. ›st of functions. Cubic polynomials and the method of least squares. ıalyzing the electric utility industry of New England. Price, revenue, :ofit, and the profit analysis for a refinery. Consumer surplus.