

1125-34-2157 **Roger J Thelwell*** (thelwerj@jmu.edu), Department of Math and Statistics, MSC 1911,
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Taylor series from the foundation for of a wide variety of numerical methods in undergraduate numerical courses. Often, however, their apparent complexity when applied to nonlinear ordinary differential equations motivates the introduction of Runge-Kutta and other numerical integration schemes. In this talk, we re-examine the applicability of Taylor methods, thanks to modern Computer Algebra Systems such as Maple and Mathematica. Taylor methods can now be easily applied to problems ranging from initial value problems and boundary value problems, and make the analysis of stability and control a straightforward exercise. A number of open problems will be explored to demonstrate the approach. (Received September 19, 2016)