1145-34-1722   **Saurabh Tomar*** (`sauravtomar9793@gmail.com`), Department of Mathematics, Indian Institute of Technology, Kharagpur, Kharagpur, 721302, India, and **R. K. Pandey** (`rkp@maths.iitkgp.ernet.in`), Department of Mathematics, Indian Institute of Technology, Kharagpur, Kharagpur, 721302, India. *Approximate analytical solutions for a nonlinear fourth-order differential equation with nonlinear boundary conditions.* Preliminary report.

In this talk, we will discuss a nonlinear fourth-order two-point boundary value problem with nonlinear boundary conditions involving third-order derivatives: modeling beams on elastic foundations. This kind of problem occurs naturally in the study of deformations of elastic beams on elastic bearings. Furthermore, fourth-order two-point boundary value problems are useful for material mechanics because the problems usually characterize the deflection of an elastic beam. Our objective is to solve the problem by implementing an iterative method. We notice that the existing iterative methods seem to be very slow in this case because of the nonlinearity in the third order boundary point. The numerical results emphasize the effectiveness and high performance of the iterative method and comparisons are made with the existing results and only a few numbers of iterations are required to achieve high accuracy. The results reveal the efficiency and applicability of the method. (Received September 24, 2018)