1145-34-1289 **Hella M. Quinnett*** (hq939056@cameron.edu), 2800 W. Gore Blvd, Lawton, OK 73505, and **Narayan Thapa** (nthapa@cameron.edu), 2800 W. Gore Blvd, Lawton, OK 73505. *Numerical Solution of Beam Equation with Free Boundaries.* Preliminary report.

We consider the fourth order differential equation with suitable boundary conditions:

$$\frac{d^2}{dx^2}\left[r(x)\frac{d^2u}{dx^2}\right] = q(x)u(x) + p(x), \quad 0 \le x \le L$$
$$u(0) = a_0 \quad u(L) = a_L$$
$$u''(0) = b_0 \quad u''(L) = b_L$$

For simple data, $q(x)u(x) + p(x)$ and $r(x)$, the beam equation can be solved by using well known techniques in differential equations. However, for a complex source function and $r(x)$, numerical techniques are the vital tools to approximate solutions to the given Boundary Value Problem. In this work, we use the finite difference method to approximate the deflection of beam. We present computational algorithms and display numerical results. (Received September 20, 2018)