1077-39-1389 **Kristen K Abernathy*** (abernathyk@winthrop.edu) and **Jesus Rodriguez**. *Existence of Solutions to Boundary Value Problems at Full Resonance.*

The focus of this talk is the study of nonlinear differential equations of the form

$$\dot{x}_i(t) = a_i(t)x_i(t) + f_i(\epsilon, t, x_1(t), \cdots, x_n(t)), \quad i = 1, 2, \cdots, n,$$

subject to two-point boundary conditions

$$b_i x_i(0) + d_i x_i(1) = 0, \quad i = 1, 2, \cdots, n.$$

We formulate sufficient conditions for the existence of solutions based on the dimension of the solution space of the corresponding linear, homogeneous equation and the properties of the nonlinear term when $\epsilon = 0$. We present the case when the solution space of the corresponding linear, homogeneous equation is n-dimensional; that is, when the system is at full resonance. The argument we use relies on the Lyapunov-Schmidt Procedure and the Schauder Fixed Point Theorem. (Received September 19, 2011)