1124-47-38 **Bo Zhang*** (bzhang@uncfsu.edu), Fayetteville State University, Department of Mathematics and Computer Scienc, 1200 Murchison Road, Fayetteville, NC 28301. *Stability by Fixed Point Theory for Infinite Delay Systems.* Preliminary report.

In this paper we study a system of nonlinear differential equations with variable delays and give conditions to ensure that the zero solution is asymptotically stable by applying Schauder's fixed point theorem. These conditions do not require the boundedness of delays, nor do they ask a fixed sign condition on the coefficient functions. An asymptotic stability theorem with necessary and sufficient conditions is proved. The reader will also see how very complete, simple, and rigorous analysis on a highly challenging stability problem can be achieved using fixed point theory on the space of continuous functions with the supremum norm. (Received August 12, 2016)