1067-46-2304 **Sarah E. Wright*** (swright@holycross.edu), Department of Mathematics & Computer Science, College of the Holy Cross, 1 College Street, Worcester, MA 01610. *Graph Algebras, Aperiodicity, and Condition (F).* Preliminary report.

The condition "every cycle has an entry" first appeared in the literature in Kumjian, Pask, and Raeburn's paper on Cuntz-Krieger algebras of directed graphs, where it was called Condition (L). It provides a necessary condition for simplicity of the associated graph algebra. This condition has been generalized to aperiodicity conditions in the theory of topological graphs (Katsura), k-graphs (Kumjian, Pask), and the unifying theory of topological k-graphs (Yeend). We'll discuss the details of these generalizations as well as the theorems associated with them. We'll then introduce a Condition (F) on the finite paths of a topological k-graph that is equivalent to the corresponding aperiodicity condition. Hence, we obtain a condition which is much easier to check than the aperiodicity of infinite paths, which we'll explore through some examples. (Received September 22, 2010)