1158-18-88 **Jade Master*** (jmast003@ucr.edu), 1181 Minerva Ct, Riverside, CA 92507. *Generalized Petri Nets.*

We give a definition of Q-Net; a generalization of Petri nets based on a Lawvere theory Q for which many existing variants of Petri nets are a special case. This definition is functorial with respect to change in Lawvere theory and we exploit this to explore the relationships between different kinds of Q-nets. To justify our definition of Q-net, we construct a family of adjunctions for each Lawvere theory explicating the way in which Q-nets present free models of Q in Cat. This gives a functorial description of the operational semantics for an arbitrary category of Q-nets. We show how this can be used to construct the semantics for Petri nets, pre-nets, integer nets, and elementary net systems. (Received February 22, 2020)