1145-11-2112 **Lauren Rose*** (`rose@bard.edu`), Bard College, Department of Mathematics, Campus Road PO Box 5000, Annandale on Hudson, NY 12504, and **Jeff Suzuki**. *Triangular Bases for Modules of Generalized Splines on Arbitrary Graphs.*

Let R be a commutative ring, and $G = (V, E, A)$ be an edge labeled graph with vertex set V, edge set E and edge weights A. A vertex labeling $(g_1, g_2, \ldots, g_{|V|}) \in R^{|V|}$ is called a **generalized spline** if for any pair of vertices i, j joined by edge e with weight a, $g_i - g_j$ is an element of the ideal generated by a (equivalently, if R is the ring of integers, $g_i \equiv g_j \mod a$). We designate the set of all such splines R_G.

In (2016), Gilbert, Tymoczko, and Viel asked for a characterization of R_G as an R module. We show that if R is a Euclidean domain, R_G is a free module with a triangular basis, and we provide an explicit construction for this basis. This generalizes work done by and with undergraduates at Smith College and Bard College. (Received September 24, 2018)