

Title: Modules over Infinite Dimensional Algebras

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Abstract: Let  $A$  be an infinite dimensional  $K$ -algebra, where  $K$  is a field and let  $B$  be a basis for  $A$ .

In this talk we explore a property of the basis  $B$  that guarantees that  $K^B$  (the direct product of copies indexed by  $B$  of the field  $K$ ) can be made into an  $A$ -module in a natural way. We call bases satisfying that property "amenable" and we show that not all amenable bases yield isomorphic  $A$ -modules. Then we consider a relation (which we name congeniality) that guarantees that two different bases yield isomorphic  $A$ -module structures on  $K^B$ . We will look at several examples in the familiar setting of the algebra  $K[x]$  of polynomials with coefficients in  $K$  and will introduce several general interesting questions in that context.

Finally, if time allows, we will mention some results regarding these notions from a topological perspective.

(Joint work with Lulwah A-Essa and Najat Muthana).