

Graduate Seminar

First Speaker:

Abu Naser Sarker ,
Memorial University

Thursday, March 27
1:00 p.m., HH-3017

An Efficient Procedure to Compute the Element Matrices for the Curved Quadrilateral Finite Elements

Abstract:

The purpose of this study was to evaluate finite element matrices for curved quadrilateral elements. When the problem domain contains a curve, to discretize the domain we need triangular or quadrilateral curved elements. Quadrilateral elements reduces the number of elements needed to discretize domain. The elements under consideration were eight-node quadrilaterals with three straight sides and one curved side. In the global transformation these curved quadrilaterals in the global (x, y) coordinate system are mapped into a unit 2-square in the local parametric space ξ, η . Then, it is shown that the corresponding Jacobian of transformation is nonlinear of higher order with respect to ξ and η . Over such elements the components of element matrices produce integrands which are rational functions with bivariate polynomial numerators and bivariate polynomial denominators (of order 3). Such integrals defy our analytical skills and we used Gaussian quadrature for evaluation.

Second Speaker:

Helen Samara Dos Santos ,
Memorial University

Poor Modules

Abstract:

The definition of poor module appears naturally when trying to "measure" how far a module is from being injective. In this talk, we will define poor modules and present some basic properties and examples. Furthermore, we will give a partial answer to the following questions: what hypotheses on a ring R turn some classes of R -modules into a destitute family (i.e., every module is poor), a family with no middle class (i.e., every module is either poor or injective), or a family that is an utopia (i.e., every module is not poor)?