

Meeting: 1003, Atlanta, Georgia, MAA CP J1, MAA Session on Projects and Demonstrations that Enhance a Differential Equations Course, I

1003-J1-1144 **James Hall*** (jehall@westminster.edu), Westminster College, Mathematics and Computer Science Department, New Wilmington, PA 16172. *Differential Equations Enriched by Vector Space Concepts.*

Recent (re-)appearance of combined courses in differential equations and linear algebra serves as a reminder of the potential enrichment available to a separate differential equations course by including selected linear algebra topics with the study of linear differential equations and systems. A suitable vector space setting reveals that superposition principles are expressions of linearity and that the families of solutions of linear problems are subspaces or cosets. Equally revealing is the treatment of linear problems using linear transformations between suitable vector spaces to show practical meanings for kernel and image. Building these connections should prove valuable whether the differential equations student takes linear algebra before, concurrently with, or after the differential equations course. (A number of today's more algebraically oriented multi-variable calculus courses introduce some of these ideas as well.) (Received October 04, 2004)