## EG04 5:00-5:30 p.m. Identifying and Addressing Students' Mathematical Difficulties in Introductory Physics Courses*

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Instructors in introductory physics courses frequently complain that students' skills with basic mathematical operations are inadequate, despite prerequisite mathematics courses. Through use of written diagnostic tests (administered to more than 1300 students) and over 60 individual interviews with students in both algebra- and calculus-based courses, we have documented high error rates on problems involving basic trigonometry, vector addition, and algebra. Both carelessness and skill-practice deficits are evident factors. Consistent with other research, we found that students confronted by symbolic equations are often unable to carry out operations that they perform successfully with numbers, perhaps due to mental "overload" from symbols and functions rarely encountered in mathematics courses. An inability to efficiently access previous learning is also frequently evident. I will provide an overview of our investigation, and describe some of the initial strategies and materials we are developing to address these mathematical difficulties within the context of physics courses themselves. *Supported in part by NSF DUE #1504986