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**Reducing the failure rate in introductory physics classes** JEFF SAUL, Tiliadal STEM Education Consulting, PATRICK COULOMBE, University of New Mexico Educational Psychology Program, REBECCA LINDELL, Purdue University — Calculus-based introductory physics courses are often among the most difficult at many colleges and universities. With the national movement to increase STEM majors, the introductory calculus-based courses need to be less of a weed-out course and more of a course that propels students forward into successful majors. This talk discusses two approaches to reduce DFW rates and improve student retention: studio courses and parachute courses. Studio courses integrate lecture/laboratory into one course where the primary mode of instruction is small group activities. Typically, any students enrolled in the college or university can enroll in a studio version of the course. Parachute courses on the other hand, focus on the poor performing students. Designed so that students not doing well in an introductory physics course can switch into the parachute class mid-semester without harm to their GPA. In addition, the parachute course focuses on helping students build the knowledge and skills necessary for success when retaking the calculus-based Physics course. The studio course format has been found to reduce DFW rates at several universities by 40-60% compared with separate lecture and laboratory format versions of the same courses, while parachutes courses were less successful. At one university, the parachute course succeeded in helping 80% of students maintain their GPA, but only helped 20% successfully pass the calculus-based physics course.

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