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We describe a new calculus course for prospective and practicing high school teachers offered in the Mathematics Department at New Mexico State University in fall 2005 and fall 2006. The course is taught in a lab format and covers topics from differential and integral calculus. All topics are supplemented by detailed lesson plans which include applications in which students design and create physical objects. The course is self-contained and includes relevant topics from trigonometry and the algebra of matrices. There is no textbook, but students are given extensive handouts (about 150 pages). All numerical calculations are carried out on TI-83/84 calculators. The course is one of six partnership courses in which prospective teachers visit classrooms of practicing teachers and see how the materials that they have studied in the university class are actually used with students. We will present the mathematical content of the course, stressing the differences in the needs of the different students taking the course. We will provide samples of the materials and lesson plans, pictures of objects created by students, course evaluations, and comments from teachers taking these courses. (Received August 10, 2006)