The module course as a way of accommodating students with varied background

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Variability in undergraduate physics programs means that incoming graduate students arrive with a range of preparation. Gaps in a student’s background can be filled with independent studies. While nicely tailored to the student’s needs, these consume an inordinate amount of faculty time. On the other hand, placing a graduate student in infrequently offered advanced undergraduate courses may not provide as tailored a solution for the student and may have associated timing issues. Recently, our department has introduced a module-based course for our graduate students. We have identified a set of advanced undergraduate topics, including Lagrangian mechanics, boundary value problems in electrostatics, and MatLab applications in physics, that we believe are essential pre-requisites for success in our core, required graduate courses. We have also identified additional topics not currently covered in our required core courses, such as responsible conduct of research, but nevertheless valuable to our students. For each topic, we have developed a module equivalent to a one credit hour independent study course. One faculty member supervises all of the students in the module course each Fall term. The faculty member receives credit for teaching one course while effectively having students scattered across several courses. Although it is a bit of a challenge simultaneously supervising students in several different topics, this is offset by the lack of need to prepare new course material, once the modules are developed.