FRESHMAN PHYSICS FOR GRADUATE STUDENTS

Volkmar Dierolf and Gary DeLeo
Lehigh University, Physics Department, Bethlehem, PA

As part of our GAANN fellowship program funded by the US Department of Education, we developed a 3-credit-hour graduate course. This course is required for all incoming GAANN Fellows (3/year) and is limited in this experimental phase to these Fellows. In this course, Fellows meet regularly in a seminar setting with a physics faculty member to discuss instructional issues. The material of a typical Introductory Physics course for science students is used as the basis for examining issues related to science instruction at the elementary level, and the general communication of science content to non-scientists. Graduate fellows are required to attend the introductory physics lectures during both semesters, covering topics including mechanics, thermodynamics, electricity and magnetism, and optics. Methods used by the Introductory Physics course lecturers are examined closely in the context of effective elementary science instruction. Fellows are required to prepare and deliver practice lectures in front of their colleagues (the other fellows) and the instructor who subsequently critique their lectures. These examinations are augmented by literature searches and subsequent discussions of modern instructional theory, especially including inquiry-based learning. The students apply these techniques in teaching laboratory sections as well as in recitation sections for the Introductory Physics classes. The outcomes of the course are evaluated over the last five years. We find that the course has significant impact on the Fellows maturity as a Physicist by deepening their understanding of classic physics concept and as well as enhancing their confidence in teaching.