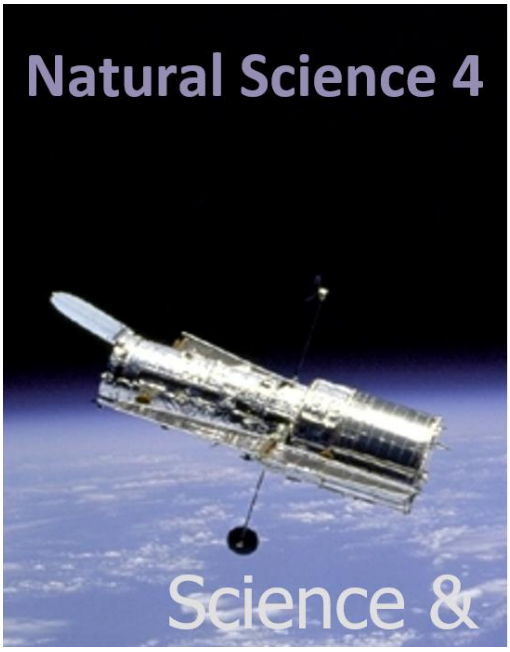
PHYSICS COLLOQUIUM



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Fresno State

Reducing Epistemically Unwarranted Beliefs in the Classroom: Effective Teaching of GE Critical Thinking at Fresno State

Abstract

Can teaching critical thinking classes really help students learn the difference between science and pseudoscience? We conducted and published a study to find out if our GE course Natural Science 4 (NS4) delivers on its desired learning outcomes. College students (n=806) were surveyed at semester's beginning and end. Epistemically unwarranted beliefs in pseudoscience were found to be pervasive among our student population. NS4, a course that specifically and directly addressed pseudoscience produced a large and significant reduction of those beliefs, but scientific research methods classes and unrelated general education classes used as controls did not. Beliefs most likely to be reduced were those of health pseudoscience. Conspiracy theories were least likely to change. We found that the educational approach of directly addressing pseudoscience (via critical thinking skills, and understanding science) is effective for changing beliefs, not just increasing knowledge, and works for most college students, not just a select subset.

3:00 p.m. – 4:30 pm Friday April 5th McLane 162