

A. Title Page

Making Introduction to Physical Science Relevant to Liberal Arts Majors

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B. Restatement of problem researched or creative activity

Introduction to Physical Science (PHSC 1013) is a freshmen level general education course offered every semester. The typical liberal arts student enrolled in this course has a negative attitude to science and mathematics. They are generally disinterested in the topics and are often just "trying to get it over with". The focus of this project is to try to change the course to fix these negative attitudes by exploiting the success of the CBS television series, "CSI". This show is extremely popular with students and incorporates some of the most advanced techniques in science today. As a result students are enjoying themselves while learning science. This proposal focused on only one aspect of the CSI series, accident investigation and reconstruction. There is a plethora of interesting and relevant physics involved in automobile accidents such as forces, momentum, vehicle dynamics, structural deformation of materials, and driver reaction times. This proposal requested funds for the principal investigator to take an online course in accident investigation from Northwestern University and to attend an on campus 10-day workshop offered by Northwestern the goal being to incorporate this training into the Introduction to Physical Science Course.

C. Brief review of the research procedure utilized

The PI completed the online Accident Investigation 1 course from Northwestern University. In the time between submitting the proposal and signing up for the ten day on campus Accident Investigation 2 course, Northwestern University created the online version of Accident Investigation 2. Additionally, the instructor from Northwestern allowed the PI to take the course at a reduced rate to help "debug" the course. This left enough funds for the PI to attend a third course on campus at Northwestern University

entitled, "Vehicle Dynamics". This course covered Newton's laws of motion, coefficient of friction and drag factor, introduction to dynamics-basic motion equations, speed estimates-using flip/vault, fall, and sideslip equations, momentum-collinear (in-line) energy-energy and skidding, kinetic energy, and velocity estimates, and speed estimates from irregular skidmarks.

D. Summary of findings

The material covered in these professional development classes are perfectly suited for Introduction to Physical Science. Since the courses are typically taken by law enforcement officers, and most officers do not have an extensive mathematical background, the material uses conceptual tools for calculating accident parameters. I intend on using these techniques in my Intro to Physical Science course.

Additionally, I polled my last two sections of Introduction to Physical Science classes with the following question: "Would you be more likely to read the material outside of class if it had a CSI type theme?" An astounding 87% of over 125 students answered "Yes". Students even felt compelled to comment on the course evaluations, below are some common responses:

16. What constructive suggestions do you have for improving the course? *Ballistics idea for changing up the course content as a great idea it would make the class more enjoyable*

17. *I would like to have more CSI type movies instead of showing the same old movies.*

18. What constructive suggestions do you have for improving the course? *More CSI based ideas*

Finally, when the students were asked which aspect of the course they found most difficult an overwhelming majority responded that the math required to solve some of the problems was most challenging. Below is a common type response on the course evaluations:

12. What constructive suggestions do you have for improving this course? This course has
math skills that I did not have. However
there was no math course needed to take
this course!

E. Conclusions and recommendations

In conclusion, the material learned from the professional development classes can effectively be implemented into the Introduction to Physical Science course. Not only does this material cover fundamental concepts/calculations in physics but it does so in a manner that is not mathematically intensive. Additionally, the students seem to enjoy the manner in which this course material can be presented.