

Applied Science Research

Year Long Course

Instructor: James Dann

This is a course for students interested in studying advanced topics in science, students who envision a career in science or engineering, and/or students who are curious about how things work. The first semester students will study advanced topics and experiments in topics including How a Car Engine Works, Atmospheric Science, Relativity, Quantum Mechanics, MRI imaging and Green Energy. This course is student centered and student driven. Students will choose the topics, experiments and projects that interest them. First semester students will learn how to design and build something, do experiments, analyze their data, graph their data and compute the errors on their experiments. Students will also learn how to read and write scientific papers and technical engineering papers. Second semester students will specialize on one topic of their choice. This can be a research science project or a research engineering project. Possible topics range from what makes a baseball curve to building a Tesla coil to particle physics to *your idea*. Students will work here and/or intern at a university or company in the area under a mentor. During the 2nd semester students will keep a detailed lab book and give weekly power point presentations on their progress. In addition, students will write a report every 2 weeks on the experiment or project. At the conclusion of the 2nd semester each student will compile their work and write a final science or engineering paper and give a full presentation of their work and results. The students have the opportunity to publish their work in a science or engineering journal.

Prerequisites: A passion for *doing* science and/or building and tinkering. A grade of B or better in physics, chemistry and math courses is recommended, exceptions can be made by department approval. Open to juniors and seniors. Exceptional sophomores can also be considered.