Troy High School
Course Profile

Course Title: Geophysical Science

Course Prerequisites: Refer To Registration Presentation

Course Description:

Geophysical Science is a laboratory science that will take an in-depth look at the natural world and its processes. It is intended for high school freshmen, sophomores, juniors, and seniors to meet the physical science requirement for graduation. This course meets the requirements for "D" Laboratory Science. The curriculum is divided into three major strands in conjunction with the Next Generation Science Standards on Earth System Science. These strands are: Astronomy, the mechanics of Earth systems, and the human impact upon these Earth systems.

Students entering this course should already have a mastery of the following concepts and possess the following skills:

- Basic outlining
- Basic note taking
- Basic reading comprehension
- Basic content review

Workload Expectations for this course (list typical amount of homework, projects, presentations, papers, etc.):

1. Hands-on laboratory experiences enable students to practice doing science in the classroom on a regular basis. Each of the 7 major units is supported by 3-6 laboratory experiences where students generate data, analyze trends in their data, and answer a scientific question. Some of these are structured or guided inquiry, and some are open inquiry. Students report their quantitative data in graphs and charts, analyzing slopes of graphs, and statistics. These methods support the NGSS Science and Engineering Practices.
2. Multimedia resources are used to support the curriculum through online scientific simulations, where students generate data, analyze trends and perform calculations. Educational video resources are used to expand on course experiences when appropriate real-life experiences are impractical. For example, virtual field trips to remote locations.
3. Research-based graphic organizers are used to enhance student processing of scientific concepts and quantitative data. Webquests are used to guide students through content online. Digital research skills are used when preparing presentations, supporting the CCSS standards for scientific literacy.
4. Graphs and charts of student data are used to support main ideas in the course. Students use their quantitative data to generate mathematical models that enhance their ability to make connections to other scientific cross-cutting concepts.

5. Small and large scale group presentations support the curriculum by engaging students in scientific debate, and arguing over the merits of different evidence. These presentations develop 21st century skills as detailed in the CCSS standards and the NGSS standards.
6. Direct instruction is used, but not stressed. Teachers deliver roughly 30% of the course content through direct instruction, combining content slides and class discussion.
7. Free-writes and quick writes support the curriculum by requiring student to put into their own words course disciplinary core ideas, science and engineering practices and cross-cutting concepts. These strategies support learners by allowing students to process and discuss their own understanding.