

Small Learning Communities



ENGINEERING INSTITUTE

SUMMARY: The Engineering Institute is a small learning community concept bringing together teachers from two subject areas (Science & Related Arts) to create a unique interdisciplinary experience for selected juniors and seniors. The courses run in a three period, consecutive block which includes a study lab period to allow extended time for guest speakers, field trips, project work, and course applications. Students must enroll in all portions of the institute. This institute is intended for students interested in careers encompassing engineering, robotics, design, and applied mathematics' fields. It fulfills requirements for one lab science and visual arts or career course. What follows is a description of the course offerings.



SCIENCE: Applied Physics

Grades 11-12 6 Credits

This course is a junior and senior elective lab science course. Students study physics' concepts and their applications in the fields of engineering, architecture, mechanics, stress/strain, and forces. Sample topics include robotics, architecture, projectiles, rockets, environment, etc. Students learn the physics behind a concept, continuing its application via the stages of product design, construction, and testing. For example, a student might learn the physics' concept inherent in building a bridge, designing a bridge, building a model bridge, and testing its effectiveness to carry a load and span a distance. Each project takes the learned knowledge and applies it to real life situations. Careers in related fields are also explored.

Prerequisite: *Classical/Physical Earth Science and Biology*

VISUAL ARTS:

Technical & Architectural Design Applications Grades 11-12 5 Credits

This course is a junior and senior elective fulfilling the state requirement for a career or visual arts course. It allows students to design, create, and build projects based upon concepts taught in both this and the Applied Physics course. This course will include instruction in AutoCAD as well as technology education. It will focus on understanding design as a process and include experiences in problem solving, creative thinking, architecture, and project construction & evaluation. Students will explore design careers which may include architecture, engineering, interior/graphic design, aerospace, or other technical careers. Computer aided drafting areas of study will include: understanding and developing two-dimensional drawings using geometric construction, basic multi-view drawings, stylistic lettering, and basic modeling techniques. Technology learning activities will allow students to design and build projects that may include catapults, robotics, model airplanes, etc.



Prerequisite: *None*

Students enrolled in the Engineering Institute may have the opportunity to present projects in a community or school-wide setting. This may include a community display, science fair, academic competition, application and design challenge, etc. Guest speakers, field trips, and distance learning may be used to enrich the curriculum.