

SCHOOLS WITH ENGINEERING PROGRAMS

Ivan Rubio

Hilltop High School | Hilltop Middle School

Teaches:

ROP Introduction to Engineering Design

ROP Principles of Engineering

ROP Civil Engineering and Architecture

ROP Gateway to Technology

The Engineering program at Hilltop High School is getting stronger year by year. Back in 2010, the CTE program started with only 2 courses: Introduction to Engineering Design (IED) and Principles of Engineering

bridges; they also learn to discuss and understand concepts ranging from vector forces to compression and tension. In 2011, Civil Engineering and Architecture was introduced as part of the Engineering Pathway. In this



course, students focus their learning on how to draw and read blueprints through the use of Revit Architecture. This state-of-the-art software is used prominently in the architectural sector and in top-tier engineering firms; Hilltop High School/Middle School students are being trained to enter the workforce as drafters when they finish this course. As part of the PLTW (Project Lead the Way) program, a new course will be introduced during the 2013-2014

(POE). Introduction to Engineering Design gradually immerses the student into the design process that takes place in order to develop a new product or to improve an existing one. Students learn about dimensioning, 3D modeling, prototyping and finished products. In the process they learn how to communicate their ideas with sketches through the use of proper scaling. The next course, Principles of Engineering (POE) takes students through the process of applying the skills they have gained in Math and Physics through hands-on projects such as building

school year: Engineering Design and Development (EDD). In this course, students will apply all the tools learned in the previous 3 courses and develop a product from start to end. They will have to find a need, develop the idea, check for patents, do market research and build a prototype. This last course is for 12th grade students only, and is considered the capstone of the PLTW program. As usual, we will be inviting speakers from colleges and from industry into the classroom to talk to students and offer them a glimpse into their future careers.



SPECIAL EDITION

SCHOOLS WITH ENGINEERING PROGRAMS

Hector Arias | Southwest High School



Teaches:

ROP Principles of Engineering
ROP Civil Engineering and Architecture

At Southwest High School we have the CPA Eco-engineering Academy Program, which offers students from all grade levels (9th to 12th) the opportunity to be exposed to the Science, Technology, Engineering and Mathematics (STEM) curriculum through project-based learning. The Career Technical Education (CTE) courses that we offer are Principles of Engineering (POE), Introduction to Design (ID), Civil Engineering and Architecture (CEA), and Engineering Research and Development; in addition, academic courses such as science, English, and social science are included as part of the Academy program. All these courses emphasize clean technologies and renewable energy concepts. POE and ID are articulated with San Diego Community College (SDCC) Courses: MFET 101 Intro to Engineering Technology, and MFET 105 Print Reading and Symbolology, respectively. Engineering Design is the industrial sector that we are related to.

Our business partners, mentors, and advisory board members include professional architects and engineers from different sectors, namely, construction, manufacturing, environmental, and government. Our ACE mentors have been working with our students for more than 5 years.

A number of scholarships (approximating \$65,000) have been granted to our students to continue with their education at the college level in the engineering field. Certificates of completion in "Manufacturing Engineering Technology" have been granted to our students through the SDCC. Our CTE teachers are certified by the National Center for Construction Education and Research (NCCER) to certify students in technical trades. Many of our students have benefited greatly from this program when they continue with higher education as well as when they join the work force.

CTECURRENTS

February 2013



SPECIAL EDITION

SCHOOLS WITH ENGINEERING PROGRAMS

Philipp Prado | Otay Ranch High School Rancho del Rey Middle School

Teaches:

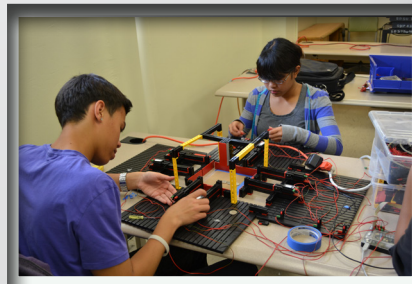
ROP Intro to Engineering Design
ROP Principles of Engineering
ROP Civil Engineering and Architecture

Otay Ranch High School (ORHS) offers students a unique look into engineering and design through its Engineering Program of Study (POS). Career Technical Education has adopted curriculum developed by Project Lead the Way (PLTW), a non-profit organization that promotes science, technology, engineering, and mathematics (STEM). The Engineering POS is a sequence of courses, which follows a proven hands-on, real-world, problem-solving approach to learning. Students discover the answers to questions such as: How are things made, and what processes go into creating products? Students use the same industry-leading 3D design software used by companies like Intel, Lockheed Martin and Pixar. STEM education is at the heart of today's high-tech, high-skill global economy.

Otay Ranch's Engineering POS consists of three courses:

Introduction to Engineering Design (IED) where students use the design process and industry standard 3D modeling software to design solutions to solve proposed problems. In Principles of Engineering (POE), students are exposed to major concepts like mechanisms, energy, statics, materials and kinematics. Civil Engineering and Architecture (CEA) students learn to design and develop residential and commercial properties using 3D architectural design software.

Throughout the POS, students learn and apply the design process, acquire strong teamwork and communication proficiency and develop strong organizational, critical-thinking, and problem-solving skills.



CTECURRENTS

February 2013



SPECIAL EDITION

SCHOOLS WITH ENGINEERING PROGRAMS

Shadi Pejuhesh | Castle Park High School

Teaches: ROP Intro to Engineering Design

The Engineering program is new at Castle Park High School. Currently we offer Introduction to Engineering Design (IED). In this course the students use sophisticated three-dimensional modeling software to improve existing products, invent new ones, and communicate details of products to others. The major focus of the IED course is to expose students to the design process, research and analysis, teamwork, communication methods, global and human impacts, engineering standards and technical documentation. The students enrolled in IED get a chance to go on various field trips related to engineering. So far this year, they have visited the San Diego State Campus and the Engineering Department. The program also brings speakers from various colleges and industries to the classroom to talk to students. Castle Park High School offers a mentorship program called ACE, which stands for Architecture, Construction and Engineering. This mentorship inspires students to pursue careers in

design and construction. By working with actual professionals in real work environments, ACE students receive an invaluable hands-on education. They learn to understand the day-to-day workings of a business by living it and experiencing it, not merely reading about it. This year students participating in the ACE mentorship went on a field trip to the New School of Architecture and the construction site of the New Central Library being built in downtown San Diego. Here at Castle Park High School, we are working closely with business partners from the industry to involve the students in internships within the next few months.

We are hoping to expand the Engineering program at this school to offer the following classes: Principles of Engineering, Civil Engineering and Architecture, and Engineering Design and Development. It is our goal to increase the internships available to our students.





SPECIAL EDITION

SCHOOLS WITH ENGINEERING PROGRAMS

**Joe Amaro | Montgomery High School
Montgomery Middle School**

Teaches:

**ROP Cabinet Making
ROP Gateway to Technology**



I graduated from Madison High School and received my bachelor's degree from San Diego State University with a major in Industrial Technology and a minor in Electrical Engineering. As a fourth generation woodworker, the many facets of my profession has given me the chance to use my training and education in mathematics, engineering principles, problem solving, materials knowledge, design background and hands-on application.

Over a quarter century of experience in manufacturing design, plant layout, problem analysis, production processing, materials,

people management, business operations and accounting have allowed me to participate in many fields; this in turn has helped me attain multiple CTE certifications. 16 years ago I redirected my focus from the corporate world to begin teaching and mentoring. I have seen first-hand the promise and capability future generations possess to contribute to society as productive individuals.

My goal is to show students that their dreams can be crafted with their own hands, using the mathematical, science and engineering skills gained while attending the schools of the Sweetwater Union High School District.

CTECURRENTS

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SPECIAL EDITION

SCHOOLS WITH ENGINEERING PROGRAMS

Beatriz Velosa
Montgomery High School | ROP Center

Teaches:

ROP Introduction to Engineering
ROP Principles of Engineering

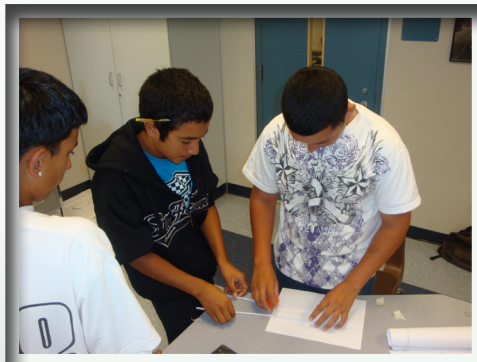


I am a new teacher with the Career Technical Education Department. I am currently teaching Introduction to Engineering and Principles of Engineering at Montgomery High School and the ROP Center. I obtained my Bachelor's Degree in Architecture from Woodbury University.

My experience comes from working on residential designs and landscape architecture. Before I began teaching, my primary focus had been working on laboratory design for Research

Facilities Design. They hired me to design laboratory facilities for universities across the United States. I have had the privilege of designing lab facilities at the University of Notre Dame and at UC Berkeley.

My passion has always been to teach; my plans are to put my energies into ensuring that the program at Montgomery continues its success with the pathway of Architecture and Design.



CTECURRENTS

February 2013



SPECIAL EDITION

SCHOOLS WITH ENGINEERING PROGRAMS

Lizette Carrillo-Ochoa
Castle Park Middle School
Eastlake Middle School

Teaches:

ROP Gateway to Technology



I am a new engineering instructor at Castle Park Middle School, and Eastlake Middle School. I currently teach Gateway to Technology, an activity oriented class where students learn how technology is used in engineering to solve everyday problems by incorporating national standards in math, science and technology.

After graduating from Woodbury University in San Diego, I worked in the architectural and engineering industry for about 16 years. My experience comes from working for firms focused on residential and commercial building projects in U.S. and Europe. My passion for architecture and engineering inspired me to begin expanding my company's services in the United States and Mexico.

After our portfolio of successful projects had grown, my business ventured into other areas, including design, construction document management, landscaping, and engineering. My love of art and design, coupled with my experience in communicating ideas visually to others, led to my current position as teacher.

I believe that engineering, in its many forms, is an important component in the future for our students, and if we can prepare our children at an early age, the odds of success will be in their favor. This great opportunity and privilege to be an engineering instructor for middle school students at Sweetwater Union District schools has become my first priority, to help prepare a stronger future generation!

CTECURRENTS

February 2013



SPECIAL EDITION

SCHOOLS WITH ENGINEERING PROGRAMS

Joel Foust | Eastlake High School

Teaches:

Introduction to Computer Programming and Gaming

Digital Electronics

Intro to Engineering Design

Principles of Engineering

There are four pre-engineering classes taught at Eastlake High School. We offer Introduction to Computer Programming and Gaming, Digital Electronics, Intro to Engineering Design, and Principles of Engineering. These classes often serve as a feeder program for our robotics team. Most of our robotics team members have taken one or more of the available pre-engineering classes. Much of the knowledge and skills attained in the pre-engineering curriculum is directly applicable to the tasks and challenges faced in the FIRST Robotics Competition each Spring. Throughout the competition season, students have an opportunity to work side by side with engineering mentors from the Naval Air Systems Command (NAVAIR), where they hone their skills and learn

first-hand from working engineering professionals. In the off-season, our students mentor local FIRST Lego League teams at nearby elementary schools and the local FIRST Tech Challenge team at the middle school. In partnership with SPAWAR/NDEP, we also host a FIRST Lego League Qualifying Tournament on our campus each November in which 24 teams compete to earn a trip to the regional competition.

Finally, our students answer the call each fall to support the Eastlake Educational Foundation by hosting their annual golf tournament and fundraiser.

