

ASME Diversity Action Grant Report

ASME student sections that receive funding through the Diversity Action Grant (DAG) program must complete and submit this report to ASME'S DAG Review Committee by no later than June 3 of the academic year in which the support was granted. Any unused funds must be returned to ASME with the report. ASME student sections that fail to submit a timely report may not be eligible to receive DAG funding for future proposals.

The outline below is the minimum required info your report should include. Additional information regarding the project, including photographs, copies of marketing materials and additional text, may be included with this project report.

NOTE: if there are personal details you do not want included when reports are published on-line, please specify and it will be removed (i.e. names, contact info).

PICTURES: if you are including photos, please be sure to include in your email that ASME has permission to use and post the images on its website.

Date: May 31, 2015

Student Section: California State University Long Beach

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Summary of DAG Project

ASME DAG Funding: \$ 3,000 **Total Project Budget:** \$ 4,725

Partnering Organizations: Society of Women Engineers (<http://www.csulbswe.org>)

K-12 Outreach & Recruitment Center for the CSULB College of Engineering Students Success Center (<http://web.csulb.edu/colleges/coe/views/essc/>)

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Attendance: Total 222

Women 222

Minorities approximately 90%

ASME Section/Region Reps 6

Project Title “Engineering Girls @ the Beach” Day

Project Description:

“Engineering Girls @ the Beach” is an outreach program offered by the College of Engineering at California State University Long Beach (CSULB) to promote engineering to young girls. “Engineering Girls @ the Beach” includes participants from elementary and middle school girls (grades 4 through 6) and has been offered every Spring semester since 2009. Funding requested from ASME was used to support the “Engineering Girls @ the Beach” event offered on March 20, 2015. The event started with a welcome and a keynote speech, which followed by hands-on workshops presented by CSULB engineering faculty from Aerospace Engineering, Chemical Engineering, Civil Engineering, Computer Science and Computer Engineering, and Mechanical Engineering, etc. and student leaders from ASME, etc. Girls participated in various outdoor activities presented by engineering student organizations and the Mobile Science Museum. This year’s keynote speaker was Ms. Cheryl Osborn, President and Founder of Casco Contractors, Inc. Ms. Osborn is also one of CSULB College of Engineering alumni from the Construction Management Program.

Project Goal/Objective and How Achieved:

The goal of the program is to promote science, engineering, and technology to women at an early age. This is done through hands-on workshops related to multiple disciplines in engineering and activities that foster problem-solving and critical-thinking skills. Workshops offered this year included “Autonomous Vehicles”, “Lemon Battery”, “Complicated Machines”, “Make a Flappy Game”, “Mechanics in Daily Life”, etc. One of the workshops was organized and conducted by the CSULB student section to introduce demonstrate robotics technology and basic concepts (such as actuators, sensors, and controllers) using Lego kits. Aside from the workshops, a multiplicity of fun and competitive activities were offered to raise girls’ awareness of the importance of doing well in their mathematics and science classes. Overall, the program focuses on helping children develop an understanding of the relationship between math and science and the ability needed to advance in the engineering professions based on achieving competence in these areas. The program presents engineering as a fun and rewarding career for those who wish to create a better quality of life; it underscores the importance of women taking part in engineering the future.

The following faculty conducted workshops:

1. Dr. Pitiporn Asvapathanagul (Civil Engineering)
2. Dr. Yan Li (Mechanical Engineering)
3. Dr. Roger Lo (Chemical Engineering)

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4. Dr. Alvaro Monge (Computer Science and Computer Engineering)
5. Dr. Lisa Star (Civil Engineering)
6. Dr. Praveen Shankar (Aerospace Engineering)
7. Dr. Rebeka Sultana (Civil Engineering)
8. Dr. Kim Vu (Human Factors Psychology)
9. Dr. Ted Yu (Chemical Engineering)
10. Dr. Thomas Strybel (Human Factors Psychology)

Evaluation of Program's Success:

As with all of our outreach programs, participants complete an event survey, which includes evaluation of the workshops and the activities. The survey tool assesses students' background knowledge of engineering (prior to experiencing the event), such as having them define what engineering is, whether they have any engineers in their family, and if their school curriculum includes any mention of engineering. The post-event portion of the survey solicits students' reaction to the program activities as well as asks them to comment on what they feel can be improved. Lastly, the survey asks students whether they would consider becoming engineers.

Other Comments/Observations/Pertinent Info:

- Keynote speaker flyer (Ms. Cheryl Osborn, CEO Casco Contractors): p. 4
- Program agenda: p. 5
- Engineering workshops: p. 6
- Select photos taken during the program (Note: photo release forms for all participants were collected and ASME has permission to use and post the images on its website): p. 7

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Cheryl Osborn is President and founder of Casco Contractors, Inc., a commercial General Contractor in Southern California that specializes in Tenant Improvement. Casco's mission is to meet the changing needs of the commercial real estate market and construct offices, industrial factories and retail developments that exceed the expectations of both the real estate developer and tenant. To accomplish this in such a male dominant field, Cheryl pioneered a concept of construction that combines time tested management and trade experience with sophisticated new age technologies and levels of communication that women have been mastering for years.

After growing up in the construction industry, Cheryl graduated from California State University, Long Beach (CSULB) School of Engineering with dual degrees in Construction Management and Interior Architectural Design. Her involvement in the construction of several epic projects including the Federal Reserve Bank of Cleveland and the Ford Motor Company Railway Station was paramount in her large project education before she focused on the Tenant Improvement sector of construction. After frustration with several medium size construction companies, Cheryl founded Casco in 2000 to implement integrity, a commitment to excellence and a devotion to client service. Casco has doubled and tripled its net volume in the first 5 years after inception and experienced tremendous and exciting growth and sustainability since then.

Cheryl is married to Jeff and they have two beautiful daughters. Balancing a successful corporation, family, and personal goals has been challenging but Cheryl approaches it with commitment, core values and a dedication to time management.

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Engineering Girls

at the Beach

College of Engineering, California State University, Long Beach
Friday March 20, 2015

AGENDA

8:30 AM – 9:00 AM	Arrival, Registration, T-shirts & Folder Distribution (Mid-morning snack, Survey)	KIN East Gym
9:10 AM	Welcome	KIN East Gym
9:15 AM	Introduction (Lita Cahuana, President, Society of Women Engineers)	KIN East Gym
9:25 AM	Keynote Speech (Cheryl Osborn, CEO Casco Contractors)	KIN East Gym
9:40 AM	Group Assignments (Pooja Somsiah, SWE Outreach Chair)	KIN East Gym
10:00 AM – 11:00 AM	Workshops I	Various Labs
11:10 AM – 12:10 PM	Workshops II	Various Labs
12:30 PM	Lunch	VEC Quad
	Engineering Student Project Displays & Activities (Mobile Science Museum, other games, etc.)	VEC Quad
1:30 PM – 2:00 PM	Closing Remarks, Departure	VEC Quad

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ENGINEERING WORKSHOPS

Workshop 1: "Lemon Battery" (Location: ECS-111)

Presenters: Dr. Ted Yu and Dr. Roger Lo (*Chemical Engineering*)

Description: Students will learn how to convert chemical energy to electrical energy. They will build their own battery out of lemons, a nail, wires, and a penny. They will use the battery to power an LED light. The objective of this workshop is to teach students about the basics of electrochemistry.

Workshop 2: "Mechanics in Daily Life" (Location: VEC 402)

Presenters: Dr. Yan Li (*Mechanical and Aerospace Engineering*)

Description: Some things in this world just don't mix - dogs and cats, oil and water, needles and balloons. Everyone knows that a balloon's worst fear is a sharp object, even a sharpened, wooden cooking skewer. With a little scientific knowledge about polymers you will be able to perform a seemingly impossible task - piercing a balloon with a wooden skewer without popping it!

Workshop 3: "LEGO Robotics" (Location: ECS-115)

Presenter: American Society of Mechanical Engineers (ASME), CSULB Chapter

Description: Robotics has numerous applications including manufacturing, surgical operation, and aerospace exploration. Lego kits will be used to demonstrate robotics technology. Students will learn basic concepts, such as actuators, sensors, and controllers.

Workshop 4: "Human Factors" (Location: ECS-202)

Presenters: Dr. Kim Vu and Dr. Thomas Strybel (*Human Factors Psychology*)

Description: Human Factors is a branch of science, engineering, and technology that applies what is known about human behavior for product design, safety, and effective use. Students will learn to identify bad product design and propose solutions as it relates to air traffic management.

Workshop 5: "Complicated Machines" (Location: VEC 417)

Presenters: Dr. Lisa Star, Dr. Pitiporn Asvathanagul, and Dr. Rebeka Sultana (*Civil Engineering*)

Description: Good engineers usually build the simplest machine possible to achieve a task. But sometimes, it is more fun not to! In this workshop students will be given a simple task, and their goal is to design and build the most overly complex contraption possible to complete the task. Extra points will be given for the teams that can come up with the most creative and most convoluted machines. The goal is to encourage creative thinking and problem solving.

Workshop 6: "Foam Gliders" (Location: VEC 418)

Presenter: David Braunstein (*COE Outreach and Recruitment*)

Description: The students will build a Styrofoam glider that has adjustable tabs. After the construction phase, the students can flight test their devices and adjust the flight by moving the tabs. It will serve as an early aeronautical experience.

Workshop 7: "Making a DC Motor" (Location: VEC 419)

Presenter: Priscilla Figueroa (*COE Outreach and Recruitment*)

Description: The students will build an electric motor using readily available materials, a magnet, coil of wire, paper clips and a battery. This safe experiment will introduce the students to the practical uses of electricity as they learn that electricity generates a magnetic field.

Workshop 8: "Autonomous Vehicles @ CASL" (Location: VEC 424A)

Presenter: Dr. Praveen Shankar (*Mechanical and Aerospace Engineering*)

Description: This workshop will involve a tour of the "Collaborative Autonomous Systems Laboratory" and an opportunity to learn about the different autonomous vehicles being designed and tested at CSULB. Participants will have the opportunity to drive the Planetary Rover being developed for the NASA RoboOps competition in the VEC Quad.

Workshop 9: "Make a Flappy Game" (Location: ECS 407)

Presenter: Dr. Alvaro Monge (*Computer Science and Computer Engineering*)

Description: In this workshop, students will learn to use drag-and-drop visual programming to make your own Flappy Bird game, and to learn about ways to customize the program to make the game look different, such as Flappy Shark, Flappy Santa, and many more.

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Photos taken at the “Engineering Girls @ the Beach” event on March 20, 2015

(Note: ASME has permission to use the images and post on its website and more photos are available on <http://www.csulbswe.org/pictures>)

