



2016

84th Annual American Society for Engineering Education Pacific Southwest Conference

April 21–23, 2016

California State Polytechnic University, Pomona



AMERICAN SOCIETY FOR
ENGINEERING EDUCATION

PACIFIC SOUTHWEST

Conference Booklet



AMERICAN SOCIETY FOR
ENGINEERING EDUCATION

PACIFIC SOUTHWEST

Since 1893, the American Society for Engineering Education, a nonprofit organization, has been “THE” membership society for faculty and institutions committed to furthering the mission of engineering and engineering technology education. It accomplishes this mission by:

1. promoting excellence in instruction, research, public service, and practice;
1. exercising worldwide leadership;
2. fostering the technological education of society; and
3. providing quality products and services to members.



ASEE Pacific Southwest (PSW) was founded in 1932. A multidisciplinary organization—with over 1,100 members including institutions in Arizona, California, Hawaii, and Nevada—PSW welcomes all STEM-related disciplines. PSW encourages participation of educators, educational researchers, student services professionals, and administrators from universities, community colleges, K-12 schools, and industry/corporate partners. To foster interest in the teaching profession and ensure new generations of engineering educators, PSW strongly supports college student participation at its conferences.

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2016

PACIFIC SOUTHWEST CONFERENCE



April 21-23, 2016 (Thursday to Saturday)

California State Polytechnic University, Pomona

3801 W. Temple Avenue — Pomona, California

www.2016asee-psw.org ASEE-PSW@cpp.edu

CONFERENCE THEME

Enhancing Public Awareness of the Engineering Profession, provides an excellent opportunity to present and share innovative approaches, tools, pedagogies, and best practices for addressing the challenges of creating greater understanding of engineering in the general public. Particular emphasis will be on student outreach, recruitment, retention, and other success strategies that increase participation among a broader cross-section of community members, tied to improving the 4- and 6-year graduation rates, and reduce the achievement gap for historically under-represented minority, low-income, first-generation, and women students.

PARTICIPATION

We welcome participation of educators from all engineering, technology, and STEM disciplines. We encourage participation of educators and professionals from universities, community colleges, K-12 schools, industry/corporate partners, and college students.



*Enhancing Public Awareness of the
Engineering Profession*

CONFERENCE SPONSORS



COLLEGE OF ENGINEERING
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SAN LUIS OBISPO



ASEE Pacific Southwest (PSW) was founded in 1932. A multidisciplinary organization—with over 1,100 members from institutions in Arizona, California, Hawaii, and Nevada—PSW welcomes all STEM disciplines.



Welcome to Pomona! The 2016 American Society for Engineering Education Pacific Southwest Conference—hosted on the campus of California State Polytechnic University, Pomona (Cal Poly Pomona)—promotes the theme, "Enhancing Public Awareness of the Engineering Profession." It provides an excellent opportunity to present and share innovative approaches, tools, pedagogies, and best practices for addressing the challenges of creating greater understanding of engineering in the general public. Particular emphasis will be on student outreach, recruitment, retention, and teaching success strategies

that increase participation and success among a broader cross-section of community members, tied to improving the 4- and 6-year graduation rates, and reducing the achievement gap for historically under-represented minority, low-income, first-generation, and women students.

We are at a critical crossroads in engineering education within the United States. With decline of American advantages in the engineering/technology marketplace, the national need for engineers is more critical than ever. Such a need has been widely articulated in numerous publications including, "Rising Above the Gathering Storm," a report by the National Academies. We encourage participation of engineering and STEM educators, student services professionals from universities, community colleges, K-12 schools, industry/corporate partners, and college students. Conferences such as this ensure that we will have an engineering workforce that is competent as it is diverse.

Program Overview: The conference program includes paper sessions, workshops, panel discussions, poster showcase, a "STEM Industries Networking" social, a tour to the Cal Poly Pomona Arabian Horse Center, networking dinner groups, and an awards banquet, during which time the 2016 recipients for the "Outstanding Faculty Teaching," "Outstanding Student," "Best Paper," and "Best Diversity Paper" will be announced. To create a sense of comfort, entertainment will be provided during the banquet by the "Kolohe Kanies," a Don Ho tribute band dedicated to the revival and preservation of Old Waikiki music that made Hawaii a welcome tourist attraction. We will also have some special performances to feature the talents of our diverse community. To provide time for attendees to renew and develop collaborative partnerships, the program also affords time for professional socializing.

Thank you for championing engineering education!

A handwritten signature in black ink that reads "Lily Gossage".

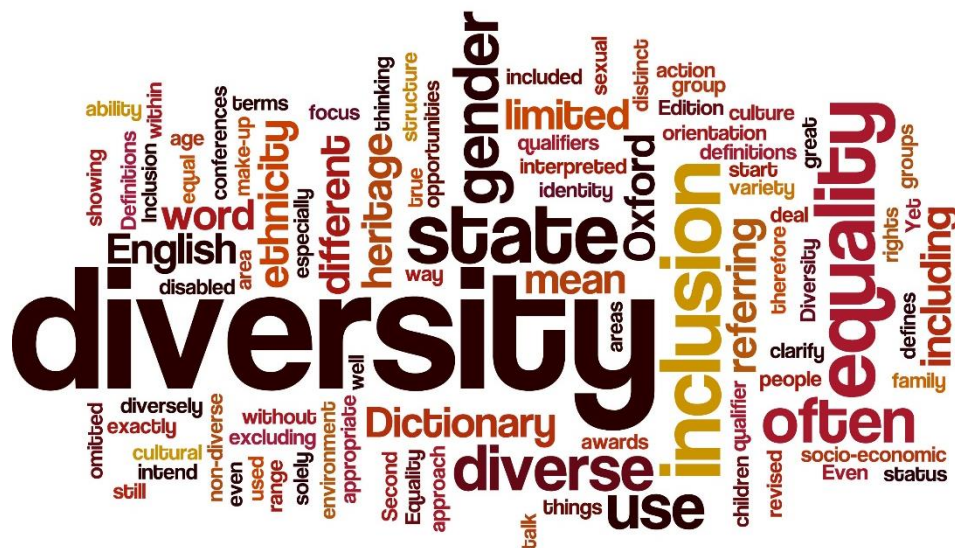
Lily Gossage
2015/2016 ASEE PSW Chair

ASEE Statement on Diversity & Inclusiveness

Engineering is empowering society in unprecedented ways. It is at the core of innovation and can address Grand Challenges facing the United States and the world. In order for the engineering discipline to reach its full potential, the engineering educational community and profession must better include all segments of our society. In particular, engineering must actively engage and help promote the pursuit of engineering education and careers with those individuals who have been historically under-represented within engineering. ASEE believes that diversity and inclusiveness are essential to enriching educational experiences and innovations that drive the development of creative solutions in addressing our world's challenges. We learn from experiences, beliefs, and perspectives that are different from our own. Diversity, both intellectually and socially, fuels innovation and the development of imaginative and enduring solutions to global problems.

ASEE strongly believes that all must be provided with equality of opportunity to pursue and advance in engineering careers and that no individual should experience marginalization or non-inclusiveness of their contributions or talents because of visible or invisible differences. These differences include age, belief system, disability status, ethnicity, gender, gender identity, gender expression, national origin, race, sexual orientation, socio-economic status, and other visible or non-visible differences. ASEE is committed to increasing the participation, inclusion, and empowerment of historically under-represented segments of society in all venues where engineering is taught, practiced, and supported. These include pre-college, college, and industry as well as professional engineering organizations.

Our vision is to create and foster environments where every individual is respected, and no one feels marginalized. ASEE believes that this can be achieved by supporting the education, recruitment, retention, and advancement of these groups in engineering education, engineering technology education, and the engineering profession.



CONFERENCE SPONSORS

The College of Engineering at Cal Poly Pomona is the 17th largest engineering school in the nation and offers one of the best undergraduate programs in the country. At Cal Poly Pomona College of Engineering, Learn by Doing is not just a motto; rather, it is a system that is fully implemented by each department and in every program. Learn by Doing is a method that produces the best engineers in the world. The College of Engineering has had over 50 years of success in educating the best undergraduate students in a wide range of engineering and engineering technology disciplines. Our **Maximizing Engineering Potential** and **Women in Engineering** programs ensure that students of diverse backgrounds (including minorities, women, first-generation, and low-income) receive the necessary support to succeed.

The Mechanical Engineering Department at Cal Poly Pomona provides a quality, well-rounded education that is based on imparting fundamental knowledge and skills in mathematics and pure science as well as engineering science and design. ME graduates are uniquely suited to jobs in all traditional areas of mechanical engineering including mechanics, machine design, energy systems, fluid flow, heat transfer and thermodynamics. To ensure this, all students take the same fundamental courses, but then choose a series of technical electives geared towards their own interests or career objectives.

At **McGraw-Hill Education**, we believe that our contribution to unlocking a brighter future lies within the application of our deep understanding of how learning happens and how the mind develops. It exists where the science of learning meets the art of teaching. Engineering educators bring a wealth of passion, dedication, and both practical and theoretical expertise to help students achieve success. We help instructors drive student achievement by delivering technology to harness understanding of how the mind works - making each moment of learning more engaging, efficient, and effective.

The College of Engineering & Computer Science at CSU Fullerton is a comprehensive regional university, situated in Orange County 35 miles from Los Angeles International Airport. Straddling some of the most innovative technical organizations in the world—ranging from aerospace companies, medical instrument manufactures to energy producers/entertainment giants—our mission is simple. We educate engineers/computer scientists who will graduate with state-of-the-art knowledge in their field and ready to embark on careers in industry and government or proceed to acquire advanced degrees in their own or related fields.

The College of Engineering at Cal Poly San Luis Obispo is a leader in engineering education. It promotes "project-based learning" to link theory with hands-on practice. Graduates are well prepared to enter graduate school or engineering profession. Cal Poly SLO engineers are highly sought by industry because they are known to "have two feet on the ground and two hands on the problem."

The California State University's (CSU) **Accessible Technology Initiative (ATI)** reflects an ongoing commitment to provide access to information resources/technologies to individuals with disabilities. This commitment is articulated in Executive Order 926 (EO 926), policy on Disability Support and Accommodations. ATI involves: creating a culture of access for an inclusive learning/working environment; helping campuses carry out EO926; applying universal design of products/services usable by the greatest number of people including individuals with disabilities; and stimulating collaboration to effect changes that will ultimately benefit all.

At **Tesoro**, we value the opportunity to make a difference in the lives of others and are committed to collaborating with our stakeholders to create cleaner, safer, well-educated communities where we operate. As an employer constantly seeking out top-talent and as a socially responsible corporate citizen, supporting STEM education-related programs is the cornerstone of Tesoro's community investment strategy.

Northrop Grumman is a leading global security company providing innovative systems, products and solutions in unmanned systems, cyber, C4ISR, and logistics and modernization to government and commercial customers worldwide. We hold ourselves to a higher standard, both in the products we deliver and in the way we conduct ourselves throughout the entire customer experience. Because, after all, we are in the business of securing a great deal more than just our place in the market.

Target believes every student should have the opportunity to reach his or her full potential. Over the years, Target supports programs/activities that benefit education at all levels. Its corporate social responsibility strategy evolves to focus on wellness as it continue to support education, designing wellness solutions to benefit students, both in school and out.



CONFERENCE-AT-A-GLANCE

84th Annual ASEE PSW CONFERENCE – Cal Poly Pomona Bronco Student Center

THURSDAY – APRIL 21

Registration 10AM-4PM (Bronco Student Center entrance)

2:00PM-3:00PM	Arabian Horse Center Tour Meet in front of the Bronco Student Center	
3:30PM-5:30PM	"STEM Industries Networking Social" Sponsored Activity: Dr. Behnam Bahr (Associate Dean, Research & Graduate Studies), Lily Gossage, (2015/2016 ASEE PSW Chair), Tom Munnerlyn (Director Career Center), Lynnette Lozoya (Director, Corporate Relations)	Ursa Major
5:45PM	Dinner Discussion Group & Networking Led by Dr. David Lanning, ASEE PSW Vice-Chair New Faculty	Meet in Ursa Major

FRIDAY – APRIL 22

Registration 7AM-10AM (Ursa Major lobby)

7:45AM	Breakfast	
8:00AM	Conference Opening Lily Gossage, 2015/2016 ASEE PSW Chair	
8:15AM	Conference Welcome Dr. Soraya Coley, President of Cal Poly Pomona	
8:30AM	Special Remarks Dr. Shanthi Srinivas, Associate Vice President, Academic Planning, Policy & Faculty Affairs Dr. S. Terri Gomez, Interim Associate Vice President, Student Success	Ursa Major
8:45AM	Review of Conference Logistics Dr. Kevin Anderson & Dr. Phyllis Nelson, Conference Co-Chairs	
8:45AM-10:15AM	CSU Course Redesign of Bottleneck Engineering Courses with Technology Initiative Sponsored Panel: Dr. Angela Shih (Chair of Mechanical Engineering, Cal Poly Pomona) with Dr. Leslie Kennedy (Director, Affordable Learning Solutions, CSU Office of the Chancellor)	
10:15AM-10:30AM	<i>Coffee/Tea Break</i>	
10:30AM-11:45AM	Concurrent Paper & Workshop Session I	Various
11:50PM-1:00PM	Lunch	
12:00PM-1:00PM	"McGraw-Hill Education - Supporting STEM Student Success" Sponsored Talk: Dr. Thomas Scaife (Brand Manager, Mc-Graw-Hill, Engineering & Physics)	Ursa Major
1:15PM-2:00PM	Poster Showcase Opening: Dr. Panadda Marayong, ASEE PSW Chair-Elect	Ursa Major
2:00PM-3:15PM	Concurrent Paper & Workshop Session II	Various
3:15PM-3:30PM	<i>Coffee/Tea Break</i>	
3:30PM-4:45PM	"Women & Men in STEM Higher Education: Navigating Family & Work-Life Balance" Sponsored Panel: Moderated by Dr. Cordelia Ontiveros (Interim Dean of Engineering)	Ursa Major
5:00PM-5:30PM	<i>Rest Break</i>	
6:00PM-9:30PM	"Awards Banquet" with Dinner <ul style="list-style-type: none"> • Emcee: Dr. G. Marie Talnack (Director, Technology Transfer, Cal Poly Pomona) • ASEE PSW Board Recognition and Entertainment ("Kolohe Kanies") • Keynote Speech: Dr. Cordelia Ontiveros (Interim Dean of Engineering) • 2016 ASEE PSW Awards: Dr. Jeffrey Ashworth, Vice-Chair of Awards • Ceremonial 'handing over' of ASEE PSW gavel: Lily Gossage, 2015/2016 ASEE PSW Chair, Dr. Panadda Marayong, 2016/2017 ASEE PSW Chair 	Ursa Major

SATURDAY – APRIL 23

7:45AM	Breakfast	
8:00AM-9:15AM	"Accessible Technology Initiative" Sponsored Talk: Susan Cullen (Assistant Director, ATI, CSU Chancellor's Office), Dr. Catherine Schmitt Whitaker (Executive Director, ATI, Cal Poly Pomona), Dr. Victoria Bhavsar (Director, Faculty Center for Professional Development, Cal Poly Pomona)	Ursa Major
9:30AM-10:45AM	Concurrent Paper & Workshop Session III	Various
11:00AM-12:15PM	Concurrent Paper & Workshop Session IV	
12:15PM-1:15PM	Lunch Additional networking time and photos	
1:30PM-3:00PM	ASEE PSW Executive Board Meeting	Ursa Major

CONCURRENT SESSIONS

FRIDAY APRIL 22

Session I: 10:30AM – 11:45AM

ANDROMEDA	LYRA	ORION	URSA MINOR
<i>Inquiry & Project-Based Learning</i>	<i>Innovative Approaches to Undergraduate Research</i>	<i>Improving the First Year Experience</i>	<i>Best Practices on Assessment, Accreditation, and Capstone Design</i>
Moderator: Kevin Anderson	Moderator: Amelito Enriquez (video-capture)	Moderator: Paul Nissenson (video-capture)	Moderator: Maryam Shafahi
<ul style="list-style-type: none"> [P4] Inquiry Based Learning Activities: Exploring Newton's 2nd Law [P21] Inquiry Based Learning Activities: Rolling Cylinders & Work-Energy [P1] Teaching Ocean Discovery through Technology to Non-Engineering Majors 	<ul style="list-style-type: none"> [P17] NASA Sponsored Student Research Experience in Cloud Computing [P38] 3D Printing of Fiber-Reinforced Polymer Matrix Composite: An Engaging Technique for Undergraduate Education and Research 	<ul style="list-style-type: none"> [P29] Workshop: Increasing First-Year Students Success through Self-Regulation (Workshop) [P30] Work-in-Progress: Engaging Freshman Students in Electrical Engineering by Building and Programming an Autonomous Arduino-Based Robot [P33] Studying Engineering: Orientation to Incoming Freshman Students 	<ul style="list-style-type: none"> [P10] Assessment of an Undergraduate Mechanical Engineering Design Capstone Course [P18] Inception and Evolution of a Capstone Design Symposium [P36] Combining Program Assessment with Learning Management for Efficient and Sustainable Accreditation Processes

Session II: 2:00PM – 3:15PM

ANDROMEDA	LYRA	ORION	URSA MINOR
<i>K-12 and Classroom Instruction</i>	<i>Use of Current and Emerging Classroom Technologies</i>	<i>Conflict Management and Ethics</i>	<i>Power and Robotics Engineering Education</i>
Moderator: Kevin Anderson	Moderator: Sima Parisay	Moderator: Parham Piroozan	Moderator: Maryam Shafahi
<ul style="list-style-type: none"> [P3] Supporting K-12 Engineering Instruction through University Outreach [P32] Calculus: Teaching It Well [P5] Engaging Community College Students in Structural Engineering Research through Natural Period Approximation for Steel Plate Shear Wall Structures 	<ul style="list-style-type: none"> [P13] Effectiveness of the Hybrid F2F/Online Model for Junior and Senior Engineering Courses [P27] Workshop: How to Record, Caption, and Publish a Video Tutorial in under 30 minutes [P35] Comparing Cooperative Learning in Online and In-Person Versions of a Microprocessors Course 	<ul style="list-style-type: none"> [P19] Empirical Study for the Effective PBL Incorporating Conflict Management Model [P14] Work-in-Progress: Engaging in Engineering Ethics: approaches to teaching moral reasoning to scientists and engineers [P15] Work-in-Progress: The SE Code Domain Specific Rule - A Structure to Support Ethical Analysis of Real-World Dilemmas 	<ul style="list-style-type: none"> [P25] Curricular Impact of a Department of Energy Grant to Revitalize Electric Power Engineering Education [P34] The Bumblebee: A Robot Controller Board for STEM Education

CONCURRENT SESSIONS

SATURDAY APRIL 23

Session III: 9:30AM –10:45AM

ANDROMEDA	LYRA	ORION	URSA MINOR
Biomedical Engineering and Electronics Education	Engaging Community College Students	Engaging Under-represented Minority or Non-traditional Students	International Education and Study Abroad Experiences
Moderator: Kevin Anderson	Moderator: Amelito Enriquez (video-capture)	Moderator: Paul Nissenson (video-capture)	Moderator: Panadda Marayong
<ul style="list-style-type: none"> [P22] The Teaching Dead: The Introduction of Physical Prototyping in Junior Year Biomedical Engineering [P23] Work-in-Progress: Inquiry-based laboratories for medical electronics course 	<ul style="list-style-type: none"> [P42] Engaging Community College Students in Engineering Research through Design and Implementation of a Human-Machine Interface for Gesture Recognition 	<ul style="list-style-type: none"> [P7] A Multi-Institutional Study of the Relationships between Nontraditional and Traditional Undergraduate Engineering Students [P8] Role Identities and Social Integration among Adult Engineering Undergraduate Students [P12] Sin el agua no hay vida: Providing Under-Represented Engineering Undergraduates Opportunities for Real-Time Learning for Student Persistence and Retention 	<ul style="list-style-type: none"> [P28] Training Future Scientists in Sustainable Sanitation through International Research Experiences (IRES) [P37] Work-in-Progress: International Partnership on the DC House Project for Rural Electrification [P39] Engineers Without Borders Nicaragua Public Elementary School Project: A Case Study in Enhancing Engineering Education through Project-Based Learning

Session IV: 11:00AM –12:15PM

ANDROMEDA	LYRA	ORION	URSA MINOR
Computer Engineering and Computer Science Education	Computer Engineering and Computer Science Education	Various Topics: Work-in-Progress	Experiential and Labs-based Learning
Moderator: Kevin Anderson	Moderator: Panadda Marayong	Moderator: Fariborz Tehrani	Moderator: Parham Piroozan
<ul style="list-style-type: none"> [P2] Teaching Software Engineers to Write by Telling Them They Already Know How [P26] A Single-Course Approach to Computer Design and Assembly Language Programming [P40] Powerful Small Group Project Presentations to Improve Engagement in Online Computer Science Courses 	<ul style="list-style-type: none"> [P6] Self-Directed Learning: Transitioning from College to the First Engineering Job [P24] Engaging Undergraduate Students in Nano-Scale Spin-Electronics Research through Summer Internship 	<ul style="list-style-type: none"> [P9] Work-in-Progress: Instructables.com as a Tool to Improve Student Outcomes and Promote Community Engagement [P20] Work-in-Progress: Ashley Madison Hack [P41] Work-in-Progress: Teaching Methods and How People Learn New Things, a Study Based on the Racket Programming Language 	<ul style="list-style-type: none"> [P11] Small and Short Range Radar System Open Source Developments for a University RF/Microwave Systems Laboratory Class [P16] Atomic Force Microscope as a Teaching Tool on Helping Students Understand Small Scale Structure of Materials [P31] Stress Analysis of a Disk Subjected to Diametrical Compression by Using a Reflection Polariscope

SPONSORED ACTIVITY Pre-conference

THURSDAY – APRIL 21 (3:30PM – 5:30PM) | Ursa Major

“STEM INDUSTRIES NETWORKING SOCIAL”

Speakers: Behnam Bahr, Ph.D., Associate Dean, Research & Graduate Studies, Lily Gossage, Director, MEP: Center for Gender, Diversity & Student Excellence, Tom Munnerlyn, Director, Career Center
California State Polytechnic University, Pomona

The "STEM Industries Networking Social" is supported by the **MENTORES (Mentoring, Educating, Networking, and Thematic Opportunities for Research in Engineering and Science)** project, funded by a Title V grant, Promoting Post-baccalaureate Opportunities for Hispanic Americans (PPOHA) | U.S. Department of Education, Washington, D.C. PR/Award Number: P031M140025. [Principal Investigator: Dr. Behnam Bahr | Co-Principal Investigator: Lily Gossage]

MENTORES (Mentoring, Educating, Networking, and Thematic Opportunities for Research in Engineering and Science) is a comprehensive educational project aimed at increasing the number of Hispanic, under-represented minority (URM), and low-income students earning master's degrees. Currently, Hispanic students represent 37% of its undergraduate enrollment and 28% of its graduate enrollment. By eliminating institutional gaps that inhibit graduate school entry, retention, degree attainment, post-graduate employment, as well as acceptance into Ph.D. programs, MENTORES will expand existing services/programs within the university in order to produce a talented pool of professionals and leaders for the STEM workforce. Though the project will be focused on California's acute need for a skilled workforce, specifically trained in water/energy infrastructure development, it can include other urgent multidisciplinary issues requiring STEM solutions. At Cal Poly Pomona, the Colleges of Engineering, Science, Agriculture, Environmental Design, Letters, Art, and Social Science participate in this project; it is a veritable campus-wide project with key personnel coming from the departments of civil engineering, geological sciences, biology, chemistry, and urban/regional planning; faculty in these disciplines believe that this project will meet their department's educational objectives for producing the *best and brightest* in the STEM workforce. Particular emphasis on collaboration with the Lyle Center for Regenerative Studies, the university's premier sustainability project, is envisioned. The new Environmental/Water Resources graduate program—which requires faculty, lab facilities, and expertise across a broad range of disciplines—is the ideal prototype for this project. Consistent with Governor Brown's emphasis on developing sustainable water/energy supplies for the state (in the face of severe drought, climate change, and population growth), is the university's pledge for meeting California's goal to reduce water/energy consumption by 20% within the next six years. This project will greatly enhance Cal Poly Pomona's efforts to meet this ambitious goal by harnessing the full intellectual power of STEM faculty and graduate students on the problem of water/energy sustainability on campus while meeting urgent societal needs.

Connect with over 30 STEM industry representatives in a relaxed setting. Learn more about MENTORES.
Hors d'oeuvres will be served! ~Special remarks by Tesoro, a conference sponsor ~

American Income Life	Northrop Grumman Corporation
Bal Seal Engineering, Inc.	P2S Engineering, Inc.
Exsilio Solutions	RBC Transport Dynamics
LEAP Career Development Forum	Robert Half
Lockheed Martin	Southern California Gas Company
Luxfer Gas Cylinders	Stantec
Manson Construction Company	Tesoro
Mladen Buntich Construction	Tevora
NNE Pharmaplan	Union Pacific Railroad
Nordson	

SPONSORED PANEL & TALK

FRIDAY – APRIL 22 (9AM – 10:15AM) | Ursa Major

“CSU’s Course Redesign with Technology Initiative: Redesigning Bottleneck Engineering Courses”

Moderator: Angela Shih, Ph.D., Professor and Chair
Department of Mechanical Engineering, California State Polytechnic University, Pomona



Cal Poly Pomona (CPP) has one of the largest engineering programs in the U.S.A. with over 5,500 undergraduate students. Engineering education is under considerable pressure to include more and new materials to restructure course content using new approaches and technologies and to manage a spectrum of students with diverse backgrounds in spite of the reduced total number of credits for graduation. Most engineering curricula have become more intensive and thus students are required to spend more time for each subject. With limited financial support, an increasing number of students at CPP are working during the week. A heavy working schedule limits students' ability to take classes in certain days and times and impedes students' ability to seek help during regular school hours. These factors attribute to a high number of students retaking certain bottleneck courses, preventing students from moving forward with degree completion; overall, it delays graduation time. To combat the enrollment bottlenecks, the CSU Office of the Chancellor is supporting an array of programs to improve students' learning success through course redesign that responds to local campus needs.

Since 2013, the Mechanical Engineering (ME) Department at Cal Poly Pomona has won a number of Course Redesign with Technology grants. Working in teams, ME faculty members have created hundreds of micro-lectures in video format, together with other educational technologies such as iClickers, smart-books, and online concept problems to redesign six bottleneck courses in Statics, Dynamics, Strength of Materials, Fluids, Thermodynamics and System Dynamics. The videos include lecture series by experienced senior ME faculty, demonstrations, simulations, derivations and homework examples. The videos are organized on the ME department website: www.cpp.edu/~meonline.

In the first half of the panel, members from the Chancellor's Office Course Redesign with Technology Team introduce the mission and goals of its various programs and share success stories with the rest of the engineering educational community. In the second half of the panel, members from the Cal Poly Pomona course redesign team will share their experiences in course redesign, best practices, lessons learned and lead an open discussion with regards to how to reshape the future of engineering education utilizing emerging technology to actively engage students and to improve students' success.

FRIDAY – APRIL 22 (12PM – 1:00PM) | Ursa Major

McGraw-Hill Education: Supporting STEM Student Success

Thomas Scaife, Ph.D., Brand Manager, Engineering and Physics
McGraw-Hill Education



As the Brand Manager for Engineering and Physics for McGraw-Hill Education, Dr. Thomas Scaife—who received his Ph.D. in Physics from The Ohio State University—develops and pursues strategies to create content and tools that support students as they develop the foundational skills needed to become professional engineers. He manages products related to courses in Physics, Mechanical Engineering, Aeronautical Engineering, Materials Engineering, Civil Engineering, Chemical Engineering, and Engineering Graphics. We are pleased to have Tom join us for this conference.

FRIDAY – APRIL 22 (3:30PM – 4:45PM) | Ursa Major

“Women & Men in STEM Higher Education: Navigating Family and Work-Life Balance”

Moderator: Cordelia Ontiveros, Ph.D., Interim Dean of Engineering
California State Polytechnic University, Pomona

It's a timeless question: How can any of us make work and life balance? What happens when children are involved? Maternity and paternity leave—who takes it? Who are the primary care givers? Are there gender differences between female and male faculty, administrators? A study from the University of Massachusetts at Amherst and the University of Maryland at College Park, “Parental Leave Usage by Fathers and Mothers at an American University,” challenges the idea that men in academia abuse gender-neutral parental leave policies to focus on research rather than parenting. Finding a lasting work-life balance—despite demanding professional careers, while tending to the needs of children, spouses, and aging parents—is a challenge for many career professionals. This panel of women and men (faculty and administrators), working in STEM higher education, representing a range of backgrounds, perspectives, and experiences, addresses this question.



PANELISTS

- Nina Abramzon, Ph.D.: Associate Chair/Professor, Department of Physics & Astronomy
California State Polytechnic University, Pomona
- Yasser Salem, Ph.D.: Associate Chair/Professor, Department of Civil Engineering
California State Polytechnic University, Pomona
- Michael Page, Ph.D.: Associate Professor, Department of Chemistry & Biochemistry
California State Polytechnic University, Pomona
- Jody Hamabata: Part-time Professor, Department of Chemical & Materials Engineering
California State Polytechnic University, Pomona
- Gerald Herder: Professor, Department of Engineering Technology
California State Polytechnic University, Pomona
- M. Ronald Yeung, Ph.D.: Interim Associate Dean, Engineering Academic Programs/Student Svc
California State Polytechnic University, Pomona
- Lily Gossage: Director, MEP: Center for Gender, Diversity & Student Excellence
California State Polytechnic University, Pomona
- Manoochehr Zoghi (“MZ”), Ph.D.: Dean of Engineering, Technology and Computer Science
Indiana University-Purdue University, Fort Wayne



2016 ASEE – Pacific Southwest

Awards Banquet

FRIDAY, APRIL 22, 2016

6:00 PM – 9:30 PM, Cal Poly Pomona

EMCEES

Dr. G. Marie Talnack

Director, Technology Transfer
Cal Poly Pomona

Dr. Panadda Marayong

Professor, Mechanical Engineering
California State University, Long Beach

Dr. Jeffrey Ashworth

Professor, Aerospace Engineering
Embry-Riddle Aeronautical University

KEYNOTE

Dr. Cordelia Ontiveros

Interim Dean of Engineering
Cal Poly Pomona

GAVEL CEREMONY

Lily Gossage

2015/2016 Chair, ASEE Pacific Southwest
Cal Poly Pomona

AWARD RECIPIENTS

OUTSTANDING TEACHING

Dr. Amelito Enriquez

Professor, Engineering & Mathematics
Cañada College

OUTSTANDING STUDENT

Rebecca Marie Kandell

Undergraduate Student, Biomedical Engineering
Cal Poly San Luis Obispo

SCHOLARLY PAPERS

“BEST PAPER”

Dr. Sohun Sohoni

Arizona State University

“Comparing Cooperative Learning in Online and In-Person Versions of a Microprocessors Course”

“BEST DIVERSITY PAPER”

Dr. Shannon Ciston

University of California, Berkeley

“A Multi-Institutional Study of the Relationships between Nontraditional and Traditional Undergraduate Engineering Students”

SPECIAL RECOGNITION

SERVICE AWARD

Dr. Simay Parisay

Cal Poly Pomona

“GOING THE EXTRA MILE”

Ana Kuppenov

Graduate Student, Computer Science – *Cal Poly Pomona*

ENTERTAINMENT *Kolohe Kanies* (A Don Ho Tribute Band dedicated to the preservation of Old Waikiki music)

SPECIAL PERFORMANCES ~*Sarah De Herrera* (National Anthem in Choctaw) ~*Dr. Cordelia Ontiveros* (West Coast Swing)

~*Racieli Andrada* (“E Pili Mai” & “My Little Grass Shack in Kealakekua Hawaii”)



HISTORY OF ASEE PSW

Chairs through the Years: 1932 to 2016

Year	Chair	Institution	Year	Chair	Institution
1932-1934	Herbert B. Langille	University of California, Berkeley	1976-1977	R. W. Reynolds	California Polytechnic State University
1934-1935	D. M. Wilson	University of Southern California	1977-1978	Robert D. Zucker	Naval Postgraduate School
1935-1936	Arthur B. Dmonoske	Stanford University	1978-1979	Robert L. Ritter	Loyola Marymount University
1936-1937	J. L. Park	University of Arizona	1979-1980	Richard C. Potter	California State University, Long Beach
1937-1938	J. V. Hazen	Los Angeles City College	1980-1981	Clyde N. Holland	Northern Arizona University
1938-1939	George L. Sullivan	Santa Clara University	1981-1982	Abraham H. Cassell	Lawrence Livermore National Laboratory
1939-1940	Fredrick H. Sibley	University of Nevada (now University of Nevada, Reno)	1982-1983	George T. Craig	San Diego State University
1940-1941	Philip S. Biegler	University of Southern California	1983-1984	Richard T. Remy	Hughes Aircraft Company
1941-1942	Herbert W. Wheaton	Fresno State College (now California State University, Fresno)	1984-1985	Vern R. Johnson	University of Arizona
1942-1946	Clement T. Wiskocil	University of California, Berkeley	1985-1986	Byron E. Thinger	PG&E
1946-1947	Arthur G. Gehrig	Pasadena City College	1986-1987	*A.F. Rick Ratcliffe	California State University, Northridge
1947-1948	Eugene L. Grant	Stanford University	1987-1988	Jay D. Pinson	San Jose State University
1948-1949	Stanley G. Palmer	University of Nevada (now University of Nevada, Reno)	1988-1989	Joseph P. Callinan	Loyola Marymount University
1949-1950	R. J. Smith	San Jose City College	1989-1990	I. Dale Dunmire	University of the Pacific
1950-1951	Edward D. Howe	University of California, Berkeley	1990-1991	William R. Wells	University of Nevada, Las Vegas
1951-1952	S. H. Duncan	University of Southern California	1991-1992	Gary Z. Watters	California State University, Chico
1952-1953	C. E. Cherry	CM	1992-1993	J. Kent Butler	California Polytechnic University, San Luis Obispo
1953-1954	C. Martin Duke	University of California, Los Angeles	1993-1994	Gerald S.	Loyola Marymount University
1954-1955	E. M. Green	Stanford University	1994-1995	William F. Pedler	Hughes Aircraft Company
1955-1956	Robert G. Moses	Pasadena City College	1995-1996	Spencer Brinkeroff	Northern Arizona University
1956-1957	D. Edward Whelan	Loyola University (now Loyola Marymount University)	1996-1997	Ash Brown	University of the Pacific
1957-1958	Irving J. Sandorf	University of Nevada (now University of Nevada, Reno)	1997-1998	Shashi Sathisan	University of Nevada, Las Vegas
1958-1959	Bonham S. Campbell	University of California, Los Angeles	1998-1999	Nambisan	California Polytechnic University, San Luis Obispo
1959-1960	H. H. Grant	University of Southern California	1999-2000	Paul Rainey	Devry Institute, Pomona
1960-1961	Robert J. Parden	Santa Clara University	2000-2001	Rose Marie Dishman	California State Polytechnic University, Pomona
1961-1962	Alfred C. Ingersoll	University of Southern California	2001-2002	Carl Rathmann	California State Polytechnic University, Pomona
1962-1963	Ray K. Linsley	Stanford University	2001-2002	Joe O'Brien	Hewlett Packard
1963-1964	Harold P. Skamser	CSPC-S (California State Polytechnic College)-Satellite, Pomona	2002-2003	J. Rich Phillips	Harvey Mudd College
1964-1965	Norman O. Gunderson	San Jose State College (now San Jose State University)	2003-2004	Lyle B. McCurdy	California State Polytechnic University, Pomona
1965-1966	W.E. Wilson	Harvey Mudd College	2004-2005	Tom Kanneman	University of California, San Diego
1966-1967	H.P. Hayes	CSPC-S (California State Polytechnic College)-Satellite, Pomona	2005-2006	Walter V. Loscutoff	California State University, Fresno
1967-1968	W.J. Pelton	Tech Inc.	2006-2007	Rahim Khoie	University of the Pacific
1968-1969	Thomas Zilka	San Francisco State College (now San Francisco State University)	2007-2008	Mel Mendelson	Loyola Marymount University
1969-1970	Jack Kadushin	Lockheed Aircraft Corporation	2008-2009	Debra Larson	Northern Arizona University
1970-1971	Russell R. O'Neill	University of California, Los Angeles	2009-2010	Sean Gallagher	Ultra-Violet Products, LLC
1971-1972	Henry O. Fuchs	Stanford University	2010-2011	Jose Macedo	California Polytechnic University, San Luis Obispo
1972-1973	A. D. May	University of California, Berkeley	2011-2012	Eric Wang	University of Nevada, Reno
1973-1974	W.J. Jordan	Pacific Telephone Company	2012-2013	Amelito Enriquez	Cañada College
1974-1975	Richard C. Dorf	University of California, Davis	2013-2014	Reza Raesi	California State University, Fresno
1975-1976	Robert L. Heyborne	University of the Pacific	2014-2015	Amir Rezaei	California State Polytechnic University, Pomona
			2015-2016	**Lily G. Gossage	California State Polytechnic University, Pomona

*1st person-of-color (man)

**2nd person-of-color (woman)

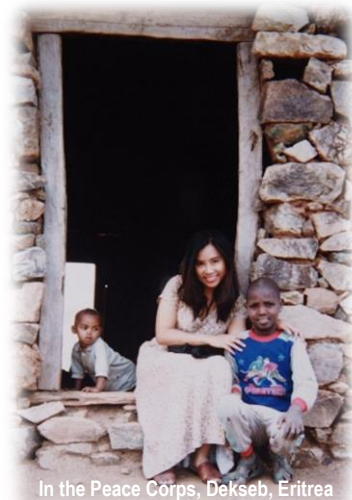
1932 Chair & 2016 Chair of the Pacific Southwest

Herbert Langille (1932 Chair)

In 1932, the Pacific Southwest section of the American Society for Engineering Education was conceived by Herbert Langille, the first Chair. Langille was born in Tusket, Nova Scotia and received his secondary training at Hood River, Oregon. In 1891, when Stanford University was organized, he matriculated as a member of its first freshman class. After completing his third year at Stanford, he spent 10 years in industry, returning in 1904 to complete the work for his baccalaureate degree in 1905. Practical work in various engineering fields occupied his time between the beginning and end of his undergraduate work. Various job titles held during this period included carpenter, electrical wireman, power plant operator, machinist and draftsman. This experience was extremely valuable to him later in the teaching of machine design. Following graduation at Stanford, Langille held a number of positions which further prepared him for the teaching he was later to undertake. During the period 1905–1912, titles of positions included those of chief draftsman, chief engineer, surveyor, and city recorder. Langille was greatly interested in the instruction of young men in the field of marine engineering, as practiced in the U. S. Navy. He spent the period 1917–1919 during World War I on active duty in the U.S. Naval Reserve as an instructor, training the college graduate officer candidates in the operation of naval machinery. Returning to the university after the war, he taught naval machinery and tactics during the formative years of the naval R.O.T.C. unit on the campus. This instructional load was carried as an addition to his already heavy schedule in Mechanical Engineering, a token of his keen interest in the instruction of young men. Summers for a number of years found him present on the naval R.O.T.C. cruises, aiding in the shipboard instruction in naval machinery. Langille's interest in teaching did not cease upon retirement. He not only kept in touch with affairs on the campus but also promoted the development of graduates through his support of the junior members program in the San Francisco section of the ASME. He also remained active in the Pacific Southwest Section of ASEE. During World War II, Langille was not content to play the part of a retired teacher but sought and obtained appointment as an instruction officer at Mare Island Navy Yard. Later in the war, he held a part-time assignment supervising War Training courses in the field of engineering.

Lily Gossage (2016 Chair)

Now in 2016, the Pacific Southwest section is chaired by Lily Gossage, the third woman (first woman-of-color) of the section. Born in Vietnam, Gossage immigrated to the United States of America during the Fall of Saigon, April 1975 when the capital fell to communist forces. With only one airplane leaving Ton Son Nhut Airport on April 24, Gossage's mother was forced to make a desperate decision. Helping her children clamber aboard a barge in the Port of Saigon, Gossage and her family survived a harrowing 7 days by sea before being rescued by an aircraft carrier. Raised by a single parent, Gossage attended K-12 schools in Long Beach, California, earned a B.S. Medical Microbiology with Minor in Chemistry from California State University, Long Beach (CSULB), a Master's in Educational Management from the University of La Verne, secondary teaching credential and cross-cultural teaching coursework from National University. After serving in the Peace Corps (Eritrea, North-East Africa), she returned to the U.S. and taught middle school science in the Long Beach Unified School District; during the summer, she taught AP science to gifted children in Orange County. In 1999, Gossage was hired as the founding director of Engineering Admissions & Advising for the College of Engineering/CSULB. From 1999–2014, her position at CSULB changed to align with the university's focus on improving graduation rates and cutting the achievement gap for minority students. Her positions have included Director of Engineering Recruitment & Retention, Director of the Engineering Honors Program, and Engineering Educational Research Associate. During her CSULB years, she developed an engineering intrusive advising approach, early identification/monitored probation program, rules for degree progress, developed/taught/coordinated ENGR101. In 2003, she founded the CSULB Women-in-Engineering Outreach Program; her efforts have resulted in eight different programs for girls. The "NASA Learning Experience for Elementary School Girls" took 35 fifth-grade girls to the Kennedy Space Center and Glenn Research Center; the "My Daughter is an Engineer" program offers parents/girls a 3-day campus dorm stay; and the "Engineering Girls—It Takes a Village" is a week-long summer residential program serving displaced girls/mothers and those residing in homeless shelters. Her programs have served over 50 schools in 10 school districts in California. Gossage is the Director of the Cal Poly Pomona Maximizing Engineering Potential (MEP) Center for Gender, Diversity & Student Excellence, where she provides management-level oversight for the development, strategic planning, implementation, and assessment of retention programming for minorities/women. As a seasoned proposal writer, her composition skills resulted in a \$2.5 million Title V Department of Education award for a graduate enrichment program called, MENTORES (Mentoring, Educating, Networking, and Thematic Opportunities for Research in Engineering and Science), for which she serves as Co-Principal Investigator. Gossage is completing her Ph.D. in Higher Education. She values a strong work ethic and believes personal tenacity comes from having a virtuous mind and a caring heart. She credits her ability to *get the job done* by having a healthy work-life balance. When she is not working, she enjoys spending time with her two sons, Luke and Aiden, and her husband, Greg.



In the Peace Corps, Dekseb, Eritrea

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Industry North

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- [P23] **Work-in-Progress: Inquiry-based Laboratories for a Medical Electronics Course** Jean-Michel Maarek, *University of Southern California*
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ABBREVIATED ABSTRACTS Papers & Workshops

Teaching Ocean Discovery through Technology to Non-Engineering Majors

Bridget Benson, John Penvenne | *California Polytechnic State University San Luis Obispo*

Humans have been exploring the ocean for thousands of years, but it wasn't until the early 1800s when systematic ocean exploration began. In the present day, scientists and engineers make use of modern technology to explore the ocean. Because the ocean affects all people, the ocean can be a great means to enhance public awareness of modern technology through describing the technology used to make important ocean discoveries.

Teaching Software Engineers to Write by Telling Them They Already Know How

Alanna Buss, Clark Turner | *California Polytechnic State University San Luis Obispo*

In the Computer Science and Software Engineering programs at Cal Poly SLO, we require students to take a course in Professional Responsibilities (2015-2017 Cal Poly Catalog 2016). In particular, the students must write a research paper that applies the IEEE/ACM Software Engineering Code of Ethics to a real current problem in computing and software.

Supporting K-12 Engineering Instruction through University Outreach

Stacey L. Carpenter¹, Danielle B. Harlow¹, Ashley Iveland¹, Brian Self²

¹University of California, Santa Barbara/ ²California Polytechnic State University, San Luis Obispo

The Next Generation Science Standards [NGSS] are new science education standards for students in grades K-12 that are beginning to be implemented across the United States. The inclusion of engineering in science instruction is perhaps the biggest difference between the NGSS and earlier standards and will have important implications for engineering departments at higher education institutions.

Inquiry Based Learning Activities: Exploring Newton's 2nd Law

Lindsey Chase, Brian Self, James Widmann, Benjamin Kraw, Michael George | *California Polytechnic State University, San Luis Obispo*

At California Polytechnic State University, San Luis Obispo, hands-on activities are being used to uncover common misconceptions among engineering students in undergraduate engineering dynamics. Once these misconceptions have been determined, Inquiry Based Learning Activities (IBLAs) are developed that prompt the students to question these misconceptions when real systems do not behave in the way they predict.

Engaging Community College Students in Structural Engineering Research through Natural Period Approximation for Steel Plate Shear Wall Structures

Amado Flores-Renteria, Jolani Chun-Moy, David Flores, Daniel Salmeron, Amelito G. Enriquez | *Cañada College*

Benjamin Kean, Cheng Chen, Wenshen Pong, Hamid Shahnasser, Hamid Mahmoodi, Kwok-Siong Teh and Xiaorong Zhang | *San Francisco State University*
Building design specifications are developed in order to provide safety, reliability, and efficiency of building designs. For seismic building codes, the design base acceleration is calculated using estimated natural period of the structure by ASCE 7-10 (American Society of Civil Engineering). This paper presents a summer intern project that engages community college students into structural engineering studies.

Self-Directed Learning: Transitioning from College to the First Engineering Job

Katherine C. Chen, Roberta J. Herter | *California Polytechnic State University, San Luis Obispo*

As an extension of a four-year, mixed-methods study of the development of self-directed learning (SDL) of a cohort of college students, we followed up with nine individuals after graduation to examine how they might or might not exhibit SDL attitudes and behaviors in their first jobs as engineering professionals. Through a questionnaire, we examine how identity, motivations, ideals may have changed as they began to practice engineering in different roles at different organizations.

A Multi-Institutional Study of the Relationships between Nontraditional and Traditional Undergraduate Engineering Students

Tressa Kay Mikel, Frank Q. Hoang, Emi Okada, Pedro Sung Hoe Kim, Audrianna Rodriguez, Maria-Isabel Carnasciali, Shannon Ciston
University of California, Berkeley/ University of New Haven

Recent demographic trends in higher education show an increasing fraction of adult students over the age of 25. Adult students can benefit classroom culture and academic performance in college and university classrooms, and it is important to promote retention of this important demographic. Studies of adult students demonstrate the importance of social integration and positive adult-traditional student relationships to the retention of adult students.

Role Identities and Social Integration Among Adult Engineering Undergraduate Students

Frank Q. Hoang, Tressa Kay Mikel, Emi Okada, Pedro Sung Hoe Kim, Audrianna Rodriguez, Maria-Isabel Carnasciali, Shannon Ciston
University of California, Berkeley/ University of New Haven

A maturing engineering workforce in the US leaves many opportunities available for aspiring engineers. However, colleges are not graduating enough engineering students to fill all job opportunities with qualified engineers despite high interest from college-bound high school seniors. Adult undergraduate engineering students represent a crucial element in fulfilling the need for engineering graduates, and they face challenges that are unique to their demographic.

Instructables.com as a Tool to Improve Student Outcomes and Promote Community Engagement: Work-in-Progress

Andrew Danowitz | California Polytechnic State University

Project-based Learning (PBL) has become a popular pedagogical tool in Engineering. Projects force students to put theory into practice, exposes students to some non-idealities (imperfect instruments, uncooperative systems, etc.) that are difficult to convey in lecture or homework, and ideally motivates students by showing how course material is related real-world engineering problems. This work discusses my preliminary/ongoing research into using Instructables.com.

Assessment of an Undergraduate Mechanical Engineering Design Capstone Course

Tanya Das, Lubi Lenaburg, Tyler Susko | University of California, Santa Barbara

Capstone design courses allow mechanical engineering students to utilize all prior analytical learning to explore engineering design, which acquaints undergraduate engineers with the real-world engineering practice that awaits them after graduation. However, due to the open-ended nature of design projects, it has proven difficult to assess student learning in capstone courses.

Small and Short Range Radar System Open Source Developments for a University RF/Microwave Systems Laboratory Class

Dennis Derickson¹, Bradley Hutchinson², Michael Harriman², Vincent Kirk³, Laura Andress³

¹California Polytechnic State University, San Luis Obispo/ ²Keysight Technologies/ ³Raytheon

Gregory Charvat and his collaborators at MIT Lincoln Labs pioneered a "Small and Short Range Radar System" do-it-yourself construction project¹. MIT has put together a one week short course based on this design and distributed an open courseware set of documentation for this radar. The open courseware documentation has created a community of experimenters and students that have spawned variants of the original design.

Sin el agua no hay vida: Providing Under-Represented Engineering Undergraduates Opportunities for Real-Time Learning for Student Persistence and Retention

Dawn M. Digrius¹, Leslie Brunell² | ¹California State University, Office of the Chancellor/ ²Stevens Institute of Technology

Providing engineering undergraduates opportunities to apply classroom-based learning into real-world situations enhances understanding of the disciplines they will practice; it also contributes to a multi-stakeholder perspective that highlights the human side of engineering. The authors, along with colleagues in the College of Engineering and Science, designed a multi-disciplinary senior design project that incorporated classroom/field-based experiences in an international setting.

Effectiveness of the Hybrid F2F/Online Model for Junior and Senior Engineering Courses

Tarek Elarabi | California State University, Fresno

"Hybrid Face-to-Face/Online courses" is a name commonly used to describe courses in which some traditional Face-to-Face (F2F) seat time has been replaced by online learning activities. The hybrid F2F/Online course model has the flexibility of fully online courses and discipline of traditional F2F in class courses. Hybrid courses model is designed to integrate both F2F and online activities so that they reinforce, complement, and elaborate one another.

Work-in-Progress: Engaging in Engineering Ethics: Approaches to Teaching Moral Reasoning to Scientists and Engineers

Elizabeth Fife | University of Southern California

The extent to which ethics can be taught in order to have an impact on student's critical thinking capacities is an ongoing discussion among ethicists and spans disciplines from social sciences, humanities, to fields that develop technical skill such as medicine and engineering. The possible benefits of engaging students in ethical philosophy are thought to range from fostering moral improvement, to increasing analytic precision, argumentation and other reasoning skills.

The SE Code Domain Specific Rule - a Structure to Support Ethical Analysis of Real-World Dilemmas

Alexis Fraga, Clark S. Turner | California Polytechnic State University, San Luis Obispo

The issue of Ethics and Professionalism is a hot topic for industrial partners; we take their call to action as our own. How do we train future Professionals in practical ways to analyze inevitable ethical dilemmas? Our approach is a rigorous application of the IEEE/ACM Software Engineering Code of Ethics and Professional Practice (SE Code) to an actual ethical dilemma involving software developers through a 4,000 word term paper.

Atomic Force Microscope as a Teaching Tool on Helping Students Understand Small Scale Structure of Materials

Yong X. Gan, Bruce Y. Decker | California State Polytechnic University, Pomona

This paper presents the education experience in using an atomic force microscope to teaching students structure assessment knowledge. A Bruker Innova atomic force microscope (AFM) has recently been established in the Department of Mechanical Engineering at Cal Poly Pomona. The Bruker Innova Atomic Force Microscope with the capability of scanning probe microscope, conductive atomic force microscope, and magnetic force atomic microscope.

NASA Sponsored Student Research Experience in Cloud Computing

Jiang Guo | California State University, Los Angeles

Student research experience is very important in computer science education. We have funding by NASA to support students conduct research on cloud computing to improve students' learning experience. This group-based collaborative project not only enhance students' motivation, confidence, problem solving skills but also helps students to apply their knowledge learned from classrooms in a real world research project, prepare students for their career in industry.

Inception and Evolution of a Capstone Design Symposium

Jim Helbling, Angela Beck | Embry-Riddle Aeronautical University, Prescott

The paper describes the inception and evolution of an engineering capstone design symposium. Senior capstone courses in Aerospace Engineering and Mechanical Engineering (AE/ME) instructed at Embry-Riddle Aeronautical University, Prescott campus (ERAU/Prescott), are two-semester sequences consisting of a Preliminary Design course and a Detail Design course in either Aeronautics, Astronautics, Robotics, Propulsion, or Energy Engineering design.

Empirical Study for the Effective PBL Incorporating Conflict Management Model

Toshihiro Ioi, Shigeaki Tanimoto, Rafiq Noorani | Chiba Institute of Technology/ Chiba Institute of Technology/ Loyola Marymount University

Project-based learning (PBL), already in use at many educational institutions, is proving highly effective in encouraging students to take an active approach to their studies. We see cases in which students participating in a PBL team are hampered by lack of project management knowledge along with a low level of leadership and group communication skills, a situation that often leads to conflict or a general loss of motivation.

Work-in-Progress: Ashley Madison Hack

Steven Johnson, Clark Turner | California Polytechnic State University San Luis Obispo

On August 18, 2015 a group or person by the name "The Impact Team" dumped over 10GB of confidential customer information from the popular online dating site Ashley Madison. "The Impact Team's" motivation for the hack was to shed light on the fact Ashley Madison used automated chat bots and did not delete all user data after a user paid for a 'full delete'.

Inquiry Based Learning Activities: Rolling Cylinders & Work-Energy

Benjamin Kraw, Brian Self, James Widmann, Lindsey Chase, Michael George | California Polytechnic State University: San Luis Obispo

Our research group (two engineering professors and a team of undergraduate Mechanical Engineering students) is studying the effects upon learning Engineering Dynamics concepts in the classroom when using hands-on activities. A set of Inquiry-Based Learning Activities (IBLAs) are conducted in the classroom where students document initial predictions of the activity, their observations during the experiment, and their reasoning for behavior they witness.

The Teaching Dead: The Introduction of Physical Prototyping in Junior Year Biomedical Engineering

Jeffrey T. La Belle, Stephanie Maxwell, Aldin Malkoc, Joseph Heath | Arizona State University

For the past 30 years, the Biomedical Engineering program at Arizona State University has featured senior Capstone courses that require students to design a medical device. This process involves both design and development with emphasis on understanding the FDA regulatory pathway. Currently there is a hole in our curriculum; there is no formal course focused on prototyping. To address topic deficiencies, the BME program at ASU has adopted the "Design Spine."

Work-in-Progress: Inquiry-based Laboratories for a Medical Electronics Course

Jean-Michel Maarek | University of Southern California

The 4-unit Medical Electronics course at USC is offered once a year with an enrollment of 40–50 students. The students attend one of two laboratory sections in addition to two weekly "lecture" periods taught using the flipped classroom approach. This approach has been reported to promote ability to learn independently as well as collaborative and team skills. In contrast, the laboratory assignments used to follow the traditional "canned" format in which students worked in pairs.

Engaging Undergraduate Students in Nano-Scale Spin-Electronics Research through Summer Internship

Juan Rodriguez Gudiel¹, Taimoor Tariq¹, Michael Gamarra¹, David Alvarez¹, Darya Almasi², Amelito G. Enriquez¹, Cheng Chen², Zhaoshuo Jiang², Wenshen Pong², Hamid Shanasser², Kwok-Siong Teh², Xiaorong Zhang², Hamid Mahmoodi² | ¹Cañada College/²San Francisco State University

Spin Transfer Torque Magnetic Memory (STTRAM) is a promising technology for non-volatile information storage. In this technology the information is stored in magnetic form that is non-volatile and also much more scalable as compared to the existing charge-based storage technologies such as SRAM, DRAM, and flash. Moreover this technology is compatible with the standard CMOS technology, which is the mainstream technology for digital integrated circuits.

Curricular Impact of a Department of Energy Grant to Revitalize Electric Power Engineering Education

Cherian P. Mathews | University of the Pacific

University of the Pacific, member of an 82-university consortium (led by University of Minnesota), is supported by a three-year Department of Energy grant to "revitalize electric power engineering education by state-of-the-art laboratories." The grant enabled University of the Pacific (whose Electrical/Computer Engineering department has no faculty with primary expertise in Power Engineering) to rapidly develop/offer a new power electronics course with a lab.

A Single-Course Approach to Computer Design and Assembly Language Programming

Bryan J. Mealy, Bridget Benson, Jeff Gerfen | California Polytechnic State University, San Luis Obispo

Engineering curricula generally present a wide breadth of topics but with enough depth to leave students with viable skills upon graduation. Widening the breadth of topics can effectively lower the depth of the topics in a course based on constant time-to-graduation rates. This paper describes an approach to presenting the topics of computer design and assembly language programming in a single course.

Workshop: How to Record, Caption, and Publish a Video Tutorial in under 30 Minutes

Paul Nissenon | California State Polytechnic University, Pomona

Video tutorials can be used by instructors for a variety of purposes. They can serve as a supplemental resource that targets difficult concepts, replace an in-class lecture when attending a conference, or be the foundation of alternative pedagogical models such as a flipped or hybrid course. It is now possible to create video tutorials easily using commercially available software, such as Camtasia Studio.

Training Future Scientists in Sustainable Sanitation through International Research Experiences (IRES)

Mónica Palomo, Natalie Mladenov, Bettina Casad | California State Polytechnic University, Pomona/ San Diego State University/ University of Missouri-St. Louis
Ensuring that new engineers are prepared to be productive citizens and professionals has led to efforts of incorporating globalization in U.S. engineering education. Greater scientific self-efficacy (directly related to students' confidence in ability to carry out scientific research), research experiences in supportive non-threatening nurturing environments, and a sense of belonging to the community of science, are factors that provide enriching student learning experiences.

Increasing First-Year Students Success through Self-Regulation

Steffen Peuker | California Polytechnic State University, San Luis Obispo

Typically, approaches to increase the nature and quality of first-year undergraduate education experience are focused on instructional and/or curricular changes. This new approach is different in that it focuses on what the students can do themselves to become successful, self-regulated students and henceforth graduate with an engineering degree.

Work-in-Progress: Engaging Freshman Students in Electrical Engineering By Building and Programming an Autonomous Arduino-Based Robot

Wayne C. Pilkington | California Polytechnic State University, San Luis Obispo

A large percentage of freshman electrical engineering students begin their undergraduate studies with only a vague idea of what electrical engineers do in their profession, and are uncertain of whether they are in the right major. While common for most incoming freshman students, this is particularly problematic for students at Cal Poly, where electrical engineering students complete nine EE-specific courses during their freshman and sophomore years.

Stress Analysis of a Disk Subjected to Diametrical Compression by Using a Reflection Polaroscope

Parham Piroozan, Cristian Galvan, Maribel Carrera, Matthew Lowry | California State Polytechnic University, Pomona

Stress analysis is a highly theoretical and conceptual topic. Some of the topics which are covered in a course in stress analysis are too abstract for students to fully comprehend the theory. This paper describes how a reflection polariscope (an optical instrument that creates full-field fringe patterns on a stressed body) was used to help students visualize and understand stresses in a stressed body.

Calculus: Teaching It Well

Oussama Safadi | University of Southern California

We teach Calculus to future engineers. Calculus courses are usually the first classes taken by our students when stepping into a university. They are critical and often the “make it or break it” classes for student success. The paper discusses how important improving the way our Calculus classes are taught and how it can be done. It discusses who should teach Calculus to our engineering students (Engineering faculty vs. Mathematics faculty).

Studying Engineering: Orientation to Incoming Freshman Students

Oussama Safadi | University of Southern California

I have noticed that many bright students who decide to study engineering have no idea what “engineering” is and certainly have no clue what to expect when majoring in engineering. Over ten years ago, I developed a seminar targeting incoming freshman students. The seminar, presented a week before starting college, is open and serves as an orientation to all incoming students.

The Bumblebee: A Robot Controller Board for STEM Education

Lana Hodzic, Kevin Ly, Aaron W. Keen, John S. Seng | California Polytechnic State University, San Luis Obispo

This paper provides a case study description of the Bumblebee robot controller. We designed the Bumblebee as a controller board that provides hardware and software support for elementary aged students interested in building robots and learning about electronics. When teaching elementary aged students, one is often limited to a selection between Arduino type hardware and LEGO Mindstorms kits.

Comparing Cooperative Learning in Online and In-Person Versions of a Microprocessors Course

Sohum Sohoni, Christopher Mar, Scotty D. Craig | Arizona State University

In this paper, we compare the in-person and online versions of a Microprocessors course. The course applies a project-centric, cooperative learning pedagogy, and provides valuable insight on the potential for adapting these active learning pedagogies to an online setting. We analyze data collected on various course outcomes, compare grade distributions for individual and teamwork components of student grades, and describe the trends observed in the data.

Combining Program Assessment with Learning Management for Efficient and Sustainable Accreditation Processes

Chengyu Sun, Raj Pamula, Russ Abbott | California State University, Los Angeles

Academic programs in colleges/universities often require periodic program assessment to ensure program quality and to obtain accreditation. A rigorous assessment process is difficult to implement due to the significant effort and resources required. In this paper we present an open-source web-based software system developed at the Computer Science Department at CSULA that tightly integrates program assessment functions with learning management functions.

Work-in-Progress: Project for Rural Electrification

Taufik Taufik, Ferdinand Milan, Mohammad Taufik

California Polytechnic State University, San Luis Obispo/ Technological Institute of the Philippines/ Universitas Padjadjaran Indonesia

The DC House project was initiated in 2010 at Cal Poly San Luis Obispo to address the issue of low rural electrification ratio in many regions around the world, most notably in developing countries. The project aims to utilize and promote global use of renewable energy sources to provide access to electricity especially in geographically hard to reach areas.

3D Printing of Fiber-Reinforced Polymer Matrix Composite: An Engaging Technique for Undergraduate Education and Research

Kory Shaffer¹, Colin McGill², Alex Furlanic², Shane Sharp², Kenzie Campbell², Amelito Enriquez², Kwok Siong Teh¹

¹San Francisco State University/ ²Cañada College

The high strength-to-weight ratios of fiber-reinforced composite materials have enabled their widespread use as structural materials in weight-critical applications (i.e., aircrafts, high performance racing vehicles, sports equipment, and prosthetics). To date, the manufacturing of fiber-reinforced composites is still a predominantly manual and labor-intensive, owing to several reasons: (i) highly customized complex geometries, (ii) high cost of tooling, and (iii) autoclave curing.

Engineers Without Borders Nicaragua Public Elementary School Project:

A Case Study in Enhancing Engineering Education through Project-Based Learning

Fiona Blackburn¹, Jesse Bluestein¹, Fariborz M. Tehrani² ¹ | California Polytechnic State University, San Luis Obispo/ ²California State University, Fresno

Project-based learning is an essential component of engineering education to prepare students for professional practice. This paper presents a case study through the lens of a public elementary school project in Nicaragua, led by the Engineers Without Borders (EWB) student chapter at Cal Poly San Luis Obispo. EWB is a student-led organization that partners with developing communities around the world to implement sustainable engineering projects.

Powerful Small Group Project Presentations to Improve Engagement in Online Computer Science Courses

Ronald P. Uhlig | National University, San Diego

Being successful in today’s engineering world requires working with others in small groups. Small group project presentations are often required in on site classes, to help students develop this skill. However, it can be difficult to provide a comparable experience for online students. This paper discusses an approach enabling student small groups to successfully create and “present” persuasive, effective, engaging PowerPoint presentations in online computer science classes.

Teaching Methods and How People Learn New Things: A Study Based on the Racket Programming Language

Jonathan Young | California State University Los Angeles

This thesis is an attempt to understand one simple question: What are the circumstances that cause students to learn? These circumstances may include but are not limited to: listening to lectures in person or online, doing exercises in class or out of class, code examples, and student independent work. The basis for this study was my experience as a teaching associate (TA) in a functional programming class in which we explored this question.

Engaging Community College Students in Engineering Research through Design and Implementation of a Human-Machine Interface for Gesture Recognition

Muslim Razi¹, Lina Tsvirkunova¹, Jeremy Chow¹, Rebecca Reus¹, Ian Donovan², Amelito G. Enriquez¹, Wenshen Pong², and Xiaorong Zhang²

¹Cañada College/ ²San Francisco State University

The role of community colleges in undergraduate education is very important for individuals from groups traditionally underrepresented in the science, technology, engineering, and mathematics (STEM) fields. Engaging community college students in cutting-edge STEM research is a significant strategy for inspiring students’ interest in STEM and increasing the recruitment and retention of STEM students.

Due to the number and length of poster abstracts, abstracts will be included in the final conference proceedings.

Self-Watering Lawn System

Leonel Acosta, Mason Reynolds, Syed Mahed, Sabrina Listec | Ohlone College

Belonging Uncertainty Among Women in Engineering: Can Wonder Woman Save the Day?

Audrey Aday | California State Polytechnic University, Pomona

Unleashing Engineering Creativity in a FYE Engineering Course

Joseph Berk | California State Polytechnic University, Pomona

An Innovative Approach to Recruit and Retain Historically Underrepresented Students in Engineering

Gerri Cole | California State Polytechnic University, Pomona

Will Genetically Engineered Amphibian Skin Microbes Inhibit Growth of Batrachochytrium Dendrobatidis?

Marina De Leon*, Wei-Jen Lin*, Derek Sarovich^ | *Cal Poly Pomona/ ^Menzies School of Health Research, Darwin, Northern Territory, Australia

The Interactive Effects of Nitrogen and Topography on the Distribution of Stipa Pulchra

Robert Fitch | California State Polytechnic University, Pomona

Fundamental Period Prediction for Steel Plate Shear Wall Structures

Amado Flores-Renteria, Jolani Chun-Moy, David Flores, Daniel Salmeron | Cañada College/ San Francisco State University

Collaboration between Multiple Unmanned Vehicles for Increased Mission Efficiency

Edward Gomez | California State Polytechnic University, Pomona

Leveraging the CSU STEM VISTA Americorps Program – Year 1: "Mandatory Tutoring"

Lily Gossage, Noe Mora | California State Polytechnic University, Pomona

Leveraging the CSU STEM VISTA Americorps Program – Year 2: "Engineering Girls–It Takes A Village"

Lily Gossage | Tiffany Nguyen, California State Polytechnic University, Pomona

EGR100 Project: Fields of Engineering Interactive Research Poster

Janet Hamabata | California State Polytechnic University, Pomona

Building Student Success: A Multi-Intervention Academic Advising Approach

Victoria Hamdi | California State Polytechnic University, Pomona

Project Study: I-15/Limonite Ave Interchange – A Partnership with Caltrans District 8

Robert Harmon, Russell Walker, Mario Garcia-Gillespie, Xudong Jia | California State Polytechnic University Pomona

Preparing Students to Work in Capstone Teams

Matthew Haslam, Embry-Riddle Aeronautical University

Work-in-Progress: Imaging the Los Angeles Basin through Modeling of Seismic Waveforms from a Temporary High-Density Deployment

Michael Herrman, Jascha Polet | California State Polytechnic University, Pomona

San Dimas Experimental Forest Watershed Modeling

Kevin Hernandez, Chris Thomas, Seema Shah-Fairbank, Kenneth Lamb | California State Polytechnic University, Pomona

The Engineering Abroad Service-Learning Program: Forging a New Paradigm for Student Engagement and Success through Unconventional Academic Experiences

Kelli Horner | Cabrillo Community College

Work-in-Progress: Incorporate Engineering Component in Learning about Solar Energy via Dye-sensitized Solar cells: Secondary Science Education

Melody Isabela | California State Polytechnic University, Pomona

Observed Improvement in Student Performance as a Result of the Introduction of Group Discussion in Lectures

Laila Jallo | California State Polytechnic University, Pomona

The Impact of Cultural Value and Cognitive Style on Web Usability

Jae Jung, Jae Min Jung, Sonya Zhang | California State Polytechnic University, Pomona

A Written Guide for Women in Physics Groups: Membership, Activities, and More

Lauren Keyes, Nina Abramzon, Alexis Knaub | California State Polytechnic University, Pomona/ Western Michigan University

Modes of Feedback in Design Review Process: Implications for Utility and Effectiveness Based on Student Gender and Tone

Gordon Krauss | Harvey Mudd

Collaborated Multiple Campuses Teaching by Converged Network Technologies

Alex Leung | Devry University

Vital Signs of the Planet: A Professional Development Program for High School and Middle School Science Educators

Hernan Lopez | California State Polytechnic University, Pomona

Creation of Polymer-Fiber Composites through the Use of Fused Deposition Modelling

Colin McGill, Alex Furlanic, Shane Sharp | Cañada College

Detection of Cyanobacteria and their Toxins for Safe Algae-based Feed Production

¹Joe McHugh, ¹Alyssa Sancio, ¹Shelton E. Murinda, ¹Marcia Murry, ²Gregory Schwartz, ²Trygve Lundquist, ³A. Mark Ibekwe
¹California State Polytechnic University, Pomona/ ²California Polytechnic State University, San Luis Obispo/ ³USDA-ARS, U.S. Salinity Lab

Repeatability Performance Evaluation of RTK and VRS Positioning Networks: A Case Study on the Cal Poly Pomona Campus

Rudy Mislang, Omar Mora | California State Polytechnic University, Pomona

Navigating a Novel Approach for Intrusion Detection in Time Series

Monica Mixco, Zekeriya Aliyazicioglu, Ha T. Le, Rajan Chandra | California State Polytechnic University, Pomona

e-Learning: Electric Circuits and MATLAB Programming Courses for Engineering Students

Woonki Na | California State University, Fresno

Surface Energy Determination through Contact Angles and Cold Plasma Treatment

Jase Nosal, Annah Ramones, Yasmina Rousan, Elline Hettiaratchy, Nina Abramzon | California State Polytechnic University, Pomona

Increasing and Retaining Minority Students' Participation in the Science, Technology, Engineering, and Mathematical Fields

Monica Palomo | California State Polytechnic University, Pomona

Direct Potable Reuse; Advanced Water Purification System, Utilizing Renewable Energy

Kurt Paul, Daniel Vera, Hector Cardenas, Victor Nguyen | California State Polytechnic University, Pomona/ Hydren, Inc.

Developing a Software Environment to Organize, Process, and Implement Gesture Recognition using Electromyography (EMG) and Inertial Measurement Unit (IMU) Data

Muslim Razi, Lina Tsvirkunova, Jeremy Chow, Rebecca Reus, Ian Donovan, Amelito G. Enriquez, Wenshen Pong, Xiaorong Zhang
Cañada College/ San Francisco State University

Logic Design using Spin Transfer Torque (STT) Technology for Hardware Security Applications

Juan Rodriguez Gudiel¹, Taimoor Tariq¹, Michael Gamarra¹, David Alvarez¹, Hamid Mahmoodi², Darya Almasi²
¹Cañada College/ ²San Francisco State University

Detecting Anomalies in Irregular Signals using K-means Clustered Signal Dictionary

Guadalupe Talavera Reyes, Zekeriya Aliyazicioglu, Rajan Chandra | California State Polytechnic University, Pomona

From Degeneration to Regeneration? Inquiry into the Environmental, Social, Economic Viability of California's Salad Bowl & Central Valley

Gilbert Verdugo, Kyle Brown | California State Polytechnic University, Pomona

The Best of All Worlds? Teaching a Learner-Centric, Object First Java Programming Class

Kendra Walther | University Of Southern California

Solar-assisted Inland Brackish Water Desalination System

Sean Yazdi, Andres Ceja, Abraham Morales, Vien Nguyen | California State Polytechnic University, Pomona

Analysis of National Bridge Inventory (NBI) Data for California Bridges

Emily Yu, Rosa Vasconez | California State Polytechnic University, Pomona

Enhancing Public Awareness of Engineering Profession via Strategic Partnerships

Manoochehr Zoghi | California State University, Fresno

BOARD MEMBER SPOTLIGHT

DR. JEFFREY ASHWORTH ASEE PSW Vice Chair of Student Awards

Jeff Ashworth grew up deep in the mountains of central West Virginia and has always focused on a diverse lifestyle. He participated on nearly every athletic team available at his high school and military preparatory school. Although he knew nothing about aerospace engineering, he was determined to pursue that discipline and attained both a Bachelor's and Master's degree from West Virginia University and was commissioned through Air Force ROTC into the U.S. Air Force. His Air Force assignments included engineering, instructing, flying, and managing.



Jeff on a Rendezvous Ride through the backcountry of Arizona

PASSION FOR FLIGHT He began his career as an Aircraft Aerodynamicist at the Flight Dynamics Laboratory at Wright Patterson Air Force Base (AFB) in Ohio. While accomplishing computational and experimental research and development, he observed aircraft flying over the base and wondered what it would be like to be in them; he volunteered and was selected for flight training. His desire was to fly fighter aircraft, but when his class graduated, there were no fighter aircraft assignments. He was assigned to the C-141 cargo aircraft and flew throughout the Pacific theatre from Travis AFB in California. After a minimal tour in the C-141, he was offered the opportunity to transition into the F-4 fighter aircraft. After training at Homestead AFB in Florida, he flew in the European theatre with home base at Torrejon Air Base in Spain. Thereafter, he returned to the Pacific theatre and flew as an F-4 instructor and flight examiner based at Kunsan AFB in the Republic of Korea (ROK). He always wanted to return to engineering, so he accepted a teaching position at the U.S. Air Force Academy (USAFA) in Colorado. After teaching at the USAFA, he went back to the F-4 and the ROK at Taegu and Osan AFB for another remote tour. He was selected for a Ph.D. program and chose to attend the University of Colorado, Boulder. After his Ph.D. in Aerospace Engineering (Unsteady Aeronautics and High Angle of Attack Maneuvering), Dr. Ashworth returned to the USAFA. Following his tour at the USAFA, he was assigned as the Director of Science and Technology in the Office of the Secretary of the Air Force (SAF) for Acquisition in Science and Technology (AQT) in the Pentagon. He also served there as the Military Assistant to the Deputy Assistant Secretary of the Air Force for Acquisition of Research and Engineering (SAF/AQ (R&E)). In this assignment, he was responsible for acquiring funding and directing research and engineering programs in the U. S. Air Force.

After retirement from the USAF, his desire to return to the wide open spaces of the west took him to Prescott, Arizona and Embry-Riddle Aeronautical University (ERAU). He came to ERAU in 1995 as the Chairman of the Aeronautical Science Department. After serving the University as Interim Chancellor, Dean of Academics, and Dean of the College of Aviation, he is now a Professor in the Aerospace Engineering Department. His diverse passion for life, engineering, teaching, flying, and ASEE makes every day exciting and rewarding. Since early childhood he has always wanted to be a cowboy, and now gets his chance by working round-ups on two cattle ranches north of Prescott.

BOARD MEMBER SPOTLIGHT

DR. AMELITO ENRIQUEZ

ASEE PSW Secretary

Amelito Enriquez is a professor of Engineering and Mathematics at Cañada College. He received his Ph.D. in Mechanical Engineering from the University of California, Irvine. He has developed a number of programs designed to help underrepresented students achieve success in STEM including the Summer Engineering Institute (an engineering summer camp for high school students), Math Jam (a math bridge program for incoming college freshmen), a NASA summer research internship program for community college students, and a scholarship program for STEM students. He also developed the Summer Engineering Teaching Institute and the Joint Engineering Program to help strengthen community college engineering programs throughout the California. He has received a number of awards including the American Society of Engineering Education Outstanding Community College Educator Award, the Hewlett-Packard Technology for Teaching Award, and the League of California Community Colleges Out-Of-The-Box Thinkers Award. In December 2011, he received the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM) presented by President Obama in the White House. Amelito is the Principal Investigator for a number of federally funded grants: Student On-ramp Leading to Engineering and Sciences (SOLES) funded by the US Department of Education Minority Science and Engineering Improvement Program (MSEIP); California Alliance for the Strengthening of Transfer Engineering Programs (CALSTEP) funded by the US Department of Education Hispanic Serving Institution Science, Technology, Engineering, and Mathematics (HSI STEM) program; Online and Networked Education for Transfer Engineering Programs (ONE-STEP) funded by NSF Innovations in Engineering Education and Curriculum Improvement (IEECI) program; a scholarship program funded by NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM); a mentoring program funded by NSF PAESMEM; and Creating Opportunities for Minorities in Engineering, Technology, and Science (COMETS) funded by NASA Curriculum Improvement Partnership Award for the Integration of Research (NASA CIPAIR) program. He also helped develop the Bridge to Engineering Program for Veterans funded through Veterans' Employment-Related Assistance Program (VEAP).



Amelito with his students at the 2015 ASEE PSW Conference (San Diego, CA)



Amelito and President Obama

EXCELLENCE IN MENTORING One of Amelito's shining moments included receiving the U.S. Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring—which recognizes the crucial role that mentoring plays in the academic and personal development of students studying science and engineering—particularly those who belong to groups that are underrepresented in these fields. On December 12, 2011, at the White House Oval Office, President Barack Obama honored nine recipients. When he met and shook President Obama's hand, Amelito exclaimed, "I remember thinking, 'Oh my God, he is thinner and smaller than I thought.' But he sounds exactly the same in person as he does in TV. I was impressed by how he connects with you and how sincerely he values education."

BOARD MEMBER SPOTLIGHT

DR. SIMA PARISAY ASEE PSW Webmaster



Sima Parisay is faculty emerita of the Department of Industrial and Manufacturing Engineering at Cal Poly Pomona. An immigrant from Iran, she received her Ph.D. from the University of Southern California; she started teaching at Cal Poly Pomona in 1994. As a loyal member of the ASEE PSW Board, she began volunteering as the webmaster since 2002, a role that has proved critical in maintaining both the history and archived records of the section.

Sima was also a member of the program committee for the ASEE PSW and Engineering Liaison Council Conference in 2001. Beyond PSW, she has also served on the Board of Directors for the ASEE Women in Engineering Division (WIED) – 2003. In 2006, she organized the ASEE PSW Conference, held at Cal Poly Pomona.

Her interests involve best practices in teaching Simulation and Operations Research courses. She has published papers in the ASEE Annual Conference Proceedings in 1999, 2000, and 2007; and her 1999 paper was selected as the “Best Paper” for the Manufacturing Division. Sima’s dedicated service to the section earned her the “ASEE Outstanding Campus Representative” in 2001 and 2003 and the ASEE Outstanding Zone IV Campus Representative Award for 2002/2003.

Education

B.S. Industrial Engineering, Sharif University of Technology, Iran, 1973

M.S. Production Technology and Management, Aston University, England, 1975

Ph.D. Industrial and Systems Engineering with a minor in Computer Science, University of Southern California, 1996
(Dissertation: The Application of Inductive Learning in Simulation of Queuing Systems)

ASEE Published Papers

1999: Implementation of Classroom Assessment Techniques and Web Technology in an Operations Research Course

2000: Multimedia and Assessment Techniques in an Operations Research Course

2007: Effective Pedagogical Techniques in Operations Research Courses Intent on Improving Analysis Skills and Writing Report



Sima at the 2006 ASEE PSW Conference – Cal Poly Pomona



The California State University
Course Redesign with Technology Initiative
Redesigning Bottleneck Engineering Courses



Angela Shih, Ph.D.,
 Professor and Chair
 Mechanical Engineering Department
 Cal Poly Pomona

Leslie Kennedy
 Director, Affordable Learning Solutions
 California State University
 Office of the Chancellor



Cal Poly Pomona (CPP) has one of the largest engineering programs in the US with over 5,500 undergraduate students. Engineering education is under considerable pressure to include more and new materials, to restructure the course content using new approaches and technologies and to manage a spectrum of students with diverse backgrounds in spite of the reduced total number of credits for graduation. Most engineering curricula have become more intensive and thus students are required to spend more time for each subject. With limited financial support, an increasing number of students at CPP are working during the week. A heavy working schedule limits the students' ability to take classes in certain days and times, and impedes the students' ability to seek help during regular school hours. These factors attribute to a high number of students retaking certain bottleneck courses, preventing the students to move forward in their study plan and delays their graduation time. To combat the enrollment bottlenecks, the CSU Office of the Chancellor is supporting an array of programs to improve students' learning success through course redesign that responds to local campus needs.

Since 2013, the Mechanical Engineering Department at Cal Poly Pomona has won a number of Course Redesign with Technology grants. Faculty members in the ME department working in teams created hundreds of micro-lectures in video format, together with other educational technologies such as iclickers, smart-books and online concept problems to redesign six bottleneck courses in Statics, Dynamics, Strength of Materials, Fluids, Thermodynamics and System Dynamics. The videos include lecture series by experienced senior ME faculty, demonstrations, simulations, derivations and homework examples. The videos are organized in ME's own website: www.cpp.edu/~meonline.

Welcome to Mechanical Engineering Online!

2016 ASEE PSW Conference Sponsor

Friday, April 22, 2016
9:00 am - 10:15 am
URSA MAJOR

In the first half of the workshop, members from the Chancellor's Office Course Redesign with Technology Team are invited to introduce the mission and goals of its various programs, and to share the success stories with the rest of the engineering education community. In the 2nd half of the workshop, members from the Cal Poly Pomona course redesign team will share their experiences in course redesign, best practices, lessons learned and lead an open discussion with regards to how to reshape the future of engineering education utilizing emerging technology to actively engage students and to improve students' success.

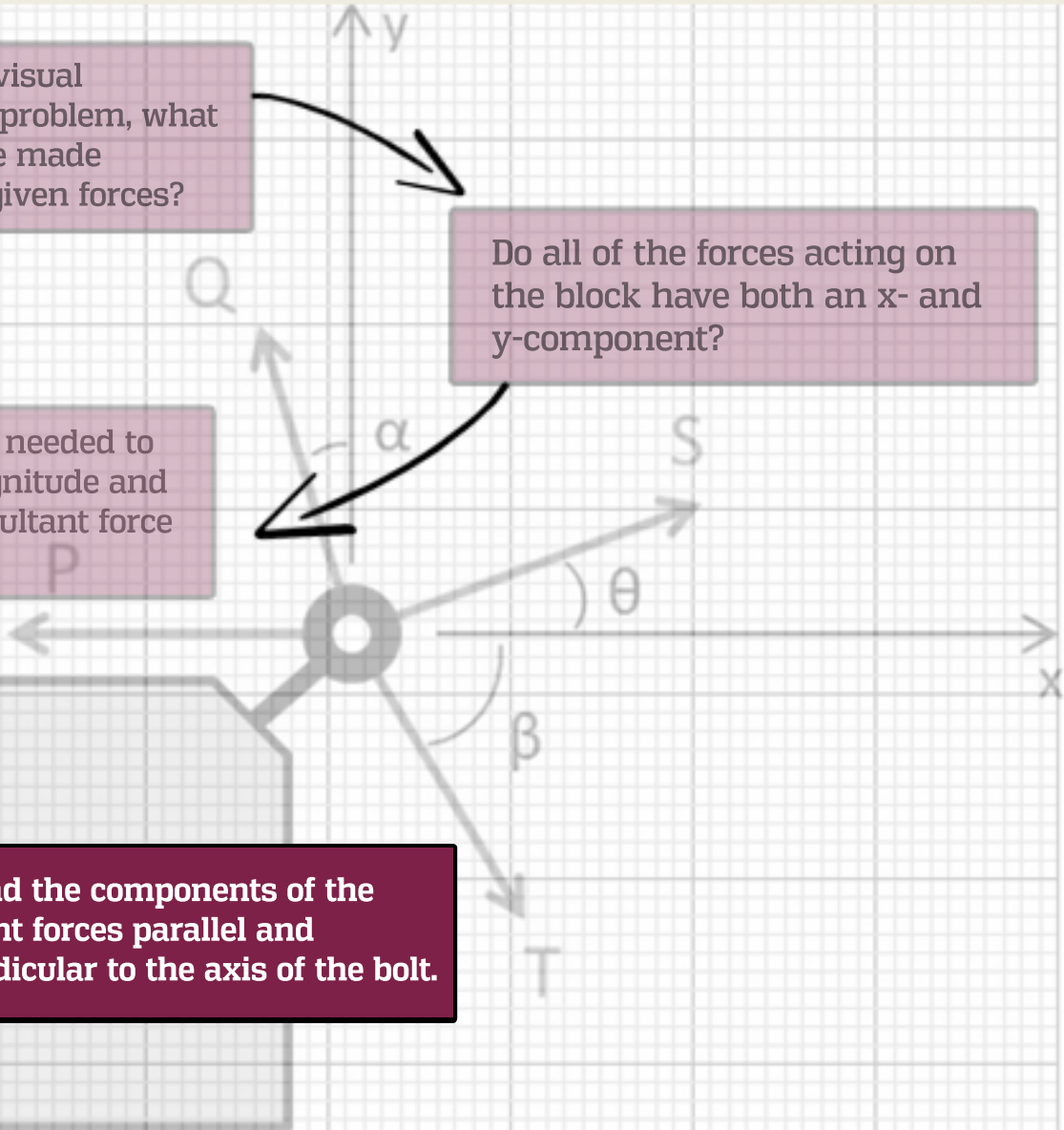


After performing a visual examination of the problem, what assumptions can be made regarding the four given forces?

Do all of the forces acting on the block have both an x- and y-component?

What are the steps needed to determine the magnitude and direction of the resultant force acting on the bolt?

Now find the components of the resultant forces parallel and perpendicular to the axis of the bolt.



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Vision Statement

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- » Largest engineering college in Southern California
- » Estimated that 1 out of every 14 engineers in California graduate from Cal Poly Pomona
- » Highly diverse, 38% of our students are historically underrepresented

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COMMUNITY INVESTMENTS

According to the U.S. Bureau of Labor Statistics, the United States will have more than 1.2 million job openings in science-, technology-, engineering- and mathematics- (STEM) related occupations by 2018. Yet, there will be a significant shortage of qualified high school and college graduates to fill these careers.

As an employer constantly seeking out top-talent and as a socially responsible corporate citizen, supporting STEM education-related programs is the cornerstone of Tesoro's community investment strategy. Our investments in STEM education programs are making an impact. Here are some examples:



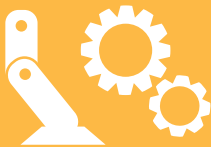
◆ Tesoro Afterschool STEM Academies

Tesoro awarded \$2.125 million to several Boys & Girls Clubs and YMCAs throughout greater Long Beach, California to launch innovative, afterschool STEM programs for middle school students.



◆ Aquarium of the Pacific

To revitalize its mobile tidepool exhibit, Aquarium on Wheels, Tesoro awarded \$200,000 to Aquarium of the Pacific in Long Beach, California.



◆ FIRST Robotics

This year, Tesoro is investing \$215,000 to help fund regional FIRST Robotics Competitions in areas where we operate.



CAREERS

As a fast-growing energy industry leader and Fortune 100 company, we hire exceptional people with the passion to make a difference. From engineers to pipefitters, chemists to accountants, IT specialists to welders, Tesoro's success relies on our ability to recruit and retain employees with exceptional STEM-related skills.

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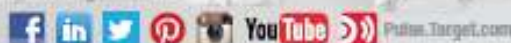
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