Interested in what Dr. Livingston does, besides heading the department? Check out his publication on Page 2!
The primary goal of the Capstone design class in the University of Arizona’s Biosystems Engineering program is to provide a student-driven interdisciplinary design experience for our students. Benefits for the students include expansion of skills, opportunities to work with professionals in industry, and ultimately obtain a job. A benefit for the Department of Agricultural and Biosystems Engineering is contact with industry supporters and outside funding for projects. Recruiting meaningful projects for the students is a year-long effort with our industry partners. This effort steps up in the summer as the fall semester looms. Most students register for their fall classes in March or April. Once the class roster is available, the instructor starts polling the students on their interests and backgrounds. This information is used to prioritize the search for projects and establish the number of projects that will be needed. Faculty members are solicited to mentor the projects, and the industry sponsors are asked to cover the material costs. The ABE department has some funds of its own ($1,000 per project), so we also accept one or two projects per year from faculty or industry without funding.

The first few class meetings in the fall are used to continue the project selection process. Questionnaires are distributed to the students to gather details on their skills and interests. A second handout provides short descriptions of the available projects. Normally, the instructor can readily assign students to the various project teams. In rare cases, there may be groups of students who do not connect with any of the available projects. When that happens, the instructor meets with them to identify common interests, and the search begins for additional projects.

The primary instructional goal of the fall semester is to teach the design process to the students. The lectures start with preliminary tasks, such as process diagrams, data collection, and identification of standards applicable to the design, ethics, safety, and environmental consequences of the projects. The lectures include a presentation on LEED because students are encouraged to evaluate their projects based on life-cycle costs. The students’ ultimate goal for the semester is to have a final design completed and accepted by their mentors.

Once the preliminary skills needed for design are mastered, the students meet with their mentors to obtain further project information so that they can move ahead with alternative formulations. These alternative designs are based on client-provided constraints, but the students are encouraged to formulate outside-the-box solutions. The alternatives are then compared in a decision matrix using standard criteria that include capital cost, operation and maintenance costs, skill level required to operate the design, and environmental impacts. The students present their decision matrix to the class and their mentors in a round-table format. The preferred alternative is typically a combination of features from multiple designs. Once a preferred alternative has been identified, the students prepare a final design. Designs should include computer-generated drawings (ACAD or Solid Works), material lists, a refined budget, and a detailed implementation schedule. We teach Microsoft Project. This software is an expensive add-on to the MS Office package, but we feel that it is an important skill for the students, as they will encounter this tool in industry.

The design phase is the key to success in the construction phase. If the students don’t have a detailed design, then they will have trouble staying on schedule.

All of our students are expected to fabricate their designs. Our instrument maker teaches the students how to use the shop fabrication equipment. Many teams start with models printed using department 3-D printers. Most teams have a team leader, whose job is to update the MS Project schedule, assist with procurement of materials, serve as primary contact with the mentor, and manage the team. So far, we have mastered the technical side of teaching project management; in the future, we will spend more time on the personnel side of the equation. The construction schedule is dictated by the Design Day competition, which is sponsored by our College of Engineering. The college brings in judges from industry to review over 100 Capstone projects and award cash prizes to the teams. Team management becomes critical as the semester winds down and Design Day approaches.

A container-based growth chamber was developed at the request of a UA donor who challenged students to provide a percentage of daily nutrition needs for a family of four living in an apartment.

Mushroom Growth Chamber

An inquiry came from an individual in Atlanta looking for a student team to design and build a container-based mushroom growth chamber for a food desert. Twelve students were interested in this project, so we divided the project into three teams: irrigation, plant infrastructure, and growth chamber. A student project manager was chosen by the students to handle communication between the teams and the mentor, acquire the needed supplies, update the MS Project schedule, and manage the team members. Each team also had its own team leader. The project was a great success and culminated with the sponsor coming to Tucson for Design Day. The success of this project has inspired the sponsor to fund other projects in the future.

Want to read more? Click Here to see other department research!
# November and December Calendar

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Veterans Awareness Week
November 7-11, 2016

M O N D A Y
Colors Ceremony & Breakfast Kickoff
8am - Admin Building Flagpole

T U E S D A Y
Vet Net Ally Training
9-10am, 12-1pm, 4-5pm, Bldg 52 Room E29
Register: https://goo.gl/forms/X5JPy3EEERf9lwm63

W E D N E S D A Y
Free Veterans Lunch
11-1pm, Veterans Success Center, Bldg 52 Room E4
RSVP: veteranscenter@calpoly.edu

T H U R S D A Y
SVO Booth during UU Hour
11-1pm, University Union
The War Comes Home Documentary
7-9pm Palm Theatre
Tickets: http://twch.eventbrite.com

F R I D A Y
American Legion Veterans Day Celebration
10:30-1pm, 1661 Mill Street, SLO
$5 All-American Lunch, wear Cal Poly green

E V E N I N G  F U N D R A I S E R S
Monday: Urbane Cafe, SLO
Tuesday: Woodstocks Pizza
Wednesday: Chipotle, SLO
Thursday: The Habit, SLO
Bring restaurant flyer, email VSC for flyers

For additional info contact Veterans Success Center, email: veteranscenter@calpoly.edu
Bldg 52 Room E4     805 756 6838
Volunteer for Fall SWE Welcome
When: Thursday, November 10th to Friday, November 11th
Did you host a conditionally admitted student at SWE Welcome last spring and have a SWE-et time? You're in luck because SWE Welcome is back this fall! Let a prospective student shadow you during the day and share your college experiences and advice with them. Can't get enough? Let them stay the night in your residence hall.

Visit this link to sign up as a host: https://goo.gl/forms/ns5E1sL9pdssmJhP2.

To sign up to be a Fall SWE Welcome Committee member, visit this link: https://docs.google.com/spreadsheets/d/1uK5nAJrWF7b64wWQNutKjeyYdSrPpXyNSq9Yu1Lt28k/edit?usp=sharing.

Sundaes on Sunday with SWE
When: Sunday, November 13th from 6:00 - 8:00 pm
Where: Santa Lucia Lobby
Have you signed up for your SWE membership yet? Come enjoy a sundae and sign up to become a member, if you haven't already, in the Santa Lucia lobby! The C2C (College to Career) membership is $30 (for freshmen and first-year transfers only), payable by cash or check, otherwise there is an annual membership for $20/year. (Annual memberships are done directly through SWE's official website) Also, if you're looking for help setting up your schedule for Winter 2017, this will be a great opportunity for SWE officers from a variety of majors to help out with that through PASS!

Become a SWE Freshmen/Transfer Rep
Are you a freshman or transfer student & interested in getting more involved with SWE? We are currently accepting applications for Freshmen & Transfer Reps!

What does a Freshmen/Transfer Rep do?
- Helps officers plan & organized events
- Gets to experience the inner workings of SWE
- Gains valuable leadership experience
- And more!

Being a Freshman or Transfer Rep is a great way to get acclimated to SWE officer responsibilities and get your foot in the door! If you are interested in applying, please fill out the application at this link: https://goo.gl/forms/AKdBqsisdn7qGJSB2. Applications are due on Friday, Nov. 18th.

Follow-up interviews with a SWE officer are tentatively scheduled for December 8th & 9th

Around the World Potluck
When: Tuesday, November 15th from 6:00 - 8:00 pm
Where: Chumash
Do you love food? If so, come join SWE, AISES, SHPE, and NSBE for our annual Around the World Potluck! Each club will be bringing their own tasty dish and hosting games throughout the night! The potluck is a great way for SWE members to meet people from other engineering clubs and see what they have to offer! Feel free to stop by Chumash on Tuesday, November 15 from 6-8 P.M., no invitation or RSVP necessary!
Society of Women Engineers (SWE) cont.

SWE / WISH General Meeting with Florence Hudson from Internet2
When: Wednesday, November 30th from 6:10 pm - 7:00 pm
Where: Advanced Technology Labs
Hosted by both SWE and WISH (Women in Software and Hardware), Florence Hudson from Internet2 will be talking about Diversity and Inclusion in the work place.
Florence Hudson is Senior Vice President and Chief Innovation Officer at Internet2, a not for profit consortium of 300+ academic institutions and 150+ research organizations developing innovations around the Internet. Prior to Internet2, Ms. Hudson was with IBM for 33 years in many leadership roles including Director of Business Development for the Internet of Things, Vice President and Director of Corporate Strategy, and Vice President of Strategy & Marketing in Systems & Technology Group. Ms. Hudson has lectured widely on many topics, including a TEDx talk regarding energy and the environment in 2012, as well as at Advanced Energy Conferences, Princeton, Columbia and Harvard Universities, and in many countries including China, South Korea, Vietnam, Spain, India, Malaysia, Singapore, Thailand, and Trinidad. Chipotle will be catered for this event!

SWE Evening With Industry (EWI)
When: Thursday, January 26, 2017 from 6:00 - 9:00 pm
Where: Avila Beach Golf Resort
Evening With Industry (EWI) is an opportunity for students to network with companies in their respective field of study and to recognize deserving Cal Poly students and faculty. The first hour of EWI consists of a networking session in which all attendees can interact, ask questions, and learn about various company opportunities. The evening continues with dinner, during which attendees sit at a company table of their choosing, a keynote speaker gives a few words, and scholarships and awards are presented.

Precision Ag and Automation Club Meeting (PAAC)
PAAC will be meeting this Wednesday from 6:10 - 7:50 pm in 8 - 122.

We will continue on Arduino Programming Basics to help club members learn robotics (will take place in 8A-3E). The club will provide all tools and equipment; you don't need to bring anything but your passion and a hungry stomach