

MESA Milestones

Featuring momentous affairs of the MESA program at Allan Hancock College

Fall 2018

MESA/STEM Students “Start Here” for Success

by Christine Reed, MESA Counselor/Coordinator



This fall MESA and STEM students were summoned to the first annual **MESA/STEM Start Here Student Success** convocation held September 13. It was for their own good. “Our students have busy lives. It’s important that they take time to invest in their success, and sometimes we have to force them to do that,” says Angelica Eullogui, MESA/STEM Counselor. It was the MESA/STEM program’s goal to give our students time at the beginning of their year to network with their peers, be informed of all the services their MESA/STEM program has to offer, learn success strategies from alum, and discover the power internships play in the academics and professional development. These were the goals identified by the MESA/STEM faculty and staff of the convocation, and 110 students showed up to make that investment in their success.

Students spent time identifying commonalities with their table mates and developing a table slogan for their group while they munched on dinner. After proper bonding, attendees learned of all the workshops and field trips being offered this semester as well as were given a tour of our updated website complete with a new scholarship toolkit and internship toolkit. This led to presentations by six past students transferring to university fall 2018 sharing words of wisdom and lessons learned along their own journeys and were ripe with insight and advice, as well as encouraging stories of the internships they so valued.

It was such an awesome experience; we can’t afford to not continue the effort in years to come.

CHECK THIS OUT Allan Hancock College Science & Engineering Club

The club’s primary purpose is to connect with industry professionals and expand students’ education. As club members, students promote camaraderie and communication within the science and engineering departments by organizing lectures, peer advising, fundraisers, ASBG participation and field trips. Visit the STEM or MESA Center for more information.



Paving the Way for My Younger Siblings

by Sofia Altamirano-Ramirez, Computer Engineering major, MESA Student

I am a first-generation college student entering my second year. I am the oldest of my three siblings, my family is from Oaxaca, Mexico and they came from a small community. I was born in Santa Maria and have lived here for most of my life. I actually started first grade because my parents thought it was unnecessary for me to go to kindergarten. They were mistaken, and I had to repeat the year. It was even more difficult because at the time I only spoke Mixteco, my native language from my pueblo. Even though I was born in Santa Maria, I lived in Mexico for a year when I had to come back to school. I slowly was able to learn to speak Spanish and then learn English, but at the cost of losing my native language. When I was in high school, I was introduced to the Oaxaqueño Youth Encuentro (OYE), a three-day indigenous youth gathering that provides a safe space for indigenous/Oaxacan youths from across California and Washington state to come together to strengthen and empower each other. It provides a space to share experiences as displaced and migrant indigenous people. Through the organization, it helped me learn more about my culture and myself.



Entering Allan Hancock College, I was not certain of the path I wanted to pursue; it reminded me of elementary school and how lost I felt. All I knew was that I wanted to continue taking math courses which had always been my favorite subject since I was young - I was able to understand math better than any other subject. Being part of MESA helped pave a way to have an interest in engineering in AHC. Honestly, I had never considered engineering until I got to community college, and I had very little knowledge about the different fields in engineering until I took the Engineering 100 course. Going to the MESA/STEM trips and laboratories gave me a spark of interest in engineering, specifically in computer engineering. I also have a best friend that is majoring in computer engineering, and she was the one that gave me the push to pursue the major. I am still at the beginning stages of the coursework related to my major and look forward to what I am capable of accomplishing.

Being in MESA has offered many experiences to help me grow as a student. During my first semesters, I took STEM 100 where I got the opportunity to learn about the UCSB Smithsonian Scholars Programs through a presentation. With the program I visited the Santa Cruz Island where I gained orienteering skills and learned about the different project other community college students were involved in. I also had the opportunity to go to Virginia and Washington D.C. In Virginia I got to job shadow in the field of ForestGEO where I was left with my partner alone in the forest collecting data from Ash trees. The program mainly focused on conservation science, but offered different careers paths to be involved. Being involved with the program, I grew an interest in conservation and working in the field of renewable energy. Another great opportunity was being invited to attend the MESA Student Leadership Conference where I was able to meet other students from community colleges and university from many similar backgrounds. At the same time, I'm still exploring my interests, so I know to take my time and learn what the best career is for me. For now, I will continue being a student, and I want my younger sisters who are five and twelve to be proud and have someone to look up to.



Don't delay!

Now is the time to invest your time and energy into securing 2019/2020 scholarships and summer 2019 Internships! See the links below and learn about securing scholarships and internships – two invaluable components of a STEM education.

<http://www.hancockcollege.edu/stem/scholarships.php>

<http://www.hancockcollege.edu/mesa/MESAinters.php>

The only thing standing between you and scholarships/internships is your effort to make it happen.

If you need help, see your MESA/STEM Centers for assistance. Make it happen for yourself. You will never regret it!

Dal Bello Deliberations

by Dom Dal Bello, Engineering Professor



Are you overcommitting yourself?

When preparing for each semester (and each week), spend time thinking about your weekly schedule. Being successful in STEM is not only about being smart; it is about working smart. You are all capable of learning the material in these courses. The key is to set yourself up for success from the very beginning of the semester by organizing your time to enable you to learn effectively. This means not overcommitting yourself to many different and time-consuming activities outside of your academics. Academics, of course, includes both class time and study time (homework is part of studying). In higher education, the standard is that each unit represents at least three learning hours – usually one hour in class and two outside of class. Thus, a 3-unit class generally meets 3 hours per week, and at least 6 hours of outside work is expected of the student. A STEM course might require more of your time to get the understanding and/or grade that you want. Perhaps 3 hours outside of class for every hour in class (4 hours per unit) is a better rule of thumb.

Those of you who have taken Engineering 100 know that we discuss the “60-hour Rule” from Ray Landis’ book, *Studying Engineering*. The premise is that you only have about 60 hours per week to do work that requires mental concentration – like school or work. Sixty hours per week is about 9 hours per day, every day of the week. Assuming you only have school and work (not counting family obligations), the 60-hour Rule is:

$$3u+w=60$$

where u is the number of units you are taking (multiplied by 3 for 3 learning hours per unit), and w is your work hours. The sum $3u + w$ should be about 60. Some students can tolerate 70 (an average of 10 hours per day), but remember, you also need to have time to unwind and relax. The Spring 2018 Engineering class consisted of a lot of dedicated students; they averaged 14 full time units, and 17 work hours, which gave them about 59 by the 60-Hour Rule. If you are exceeding 70, perhaps you need to readjust your schedule. If you want to give yourself some more time for studying, use 4 as the coefficient:

$$4u+w=Total\ Hours$$

Perhaps you will still want 60, but likely the total will be closer to 70.

The following table gives a summary of the hours you need to commit to work and school based on typical work hours and school unit.

Table 1 Weekly Work and School Hours

Work (hrs/wk)	Recommended Units per Semester	Study Time 2 hrs/unit (3 hrs/unit)	Total Hours per Week, Work and School
40	6	12 (18)	58 (64)
30	9	18 (27)	59 (66)
20	12	24 (36)	56 (68)
10	15	30 (45)	55 (70)
0	18	36 (54)	54 (72)

Engage with Others

I have been involved with engineering education for 30 years... from being a student knowing nothing about engineering, to graduating at the top of my class (which I could not have done without working with my peers and learning from each other), to being a professor who holds various leadership positions on and off campus. The skills I developed in clubs and working with others have helped prepare me for these positions. **From my observations, students who are not involved – who do not spend time on campus, and who do not connect with other students, who do not go to office hours – are the ones who are the most likely NOT to succeed in achieving their goals.** Your education is not just about learning the material sufficiently to pass a single class; your education is about developing yourself to be the best that you can be.

Now, you might say, wait, he started telling us not to get involved. No, I said not to overcommit. Part of your studying should be with other students. It is in a group that you often get the most learning done; you learn from others; you solidify your understanding by explaining to other students. Part of your college experience should be working with others in a club or on common projects. Independent projects show others you are interested in your growth outside of the classroom. Working – especially in a job that is related to your major – gives you skills and knowledge to prepare you for the professional world. They are all important in building yourself into a better you. However, do not join a study group that does too much socializing. Do not be an active member in more than two clubs. Do not focus solely on independent projects and avoid homework. Do not work more hours than necessary. Your goal is to prepare yourself for the next level. Overcommitting to activities outside of your core purpose at this point in your life – pursuing a STEM degree – may delay your success.

Enroll! STEM Students

STEM 100 – Success Strategies in STEM

- Learn about career options in STEM
- Develop effective learning strategies in STEM
- Plan academically using college resources
- Network within the STEM discipline

Engineering: My Magical Power

by Kirsten Mertz, Chemical Engineering major, STEM student

Growing up, I always knew I could do anything I wanted. I was going to grow up to be an opera singer, or a writer, or I think at one point I was going to be the savior of the world; using my inherent and unique ability to use magic with the aid of my talking dragon, Sasha. As I grew up my goals and dreams changed as I changed, and in high school I decided that engineering was where I belonged.

I was very fortunate, as I had a lot of exposure to engineers. My father has worked for Lockheed Martin my whole life, and I have wanted to follow in his footsteps since going to work with him on Take Your Daughter to Work Day. I always saw engineering as not only an option, but as the family business. I took pride in telling people what I wanted to do, because they were always surprised that a *girl* wanted to go in to *engineering*.



Primary factors why females succeed in Engineering

Believe there is no option of failure – must accomplish their goal to provide better future for family and self

Believe that if they work hard, anything is possible – not a matter of predetermined natural talent

Believe in their ability to overcome challenge and finish what they started

Don't accept prevailing cultural norms as limitations or affect confidence levels, but use as a driving force

Comfortable being an outsider and of the minority

Recognizes that finding interest in certain topics of engineering serve as reminders of their passion for the profession

Engaged in resources and strong support systems

Have other females to lean on and for which they can gain strength and motivation

It wasn't until I was accepted to Cal Poly for Materials Engineering that I saw adversity, when the reactions of surprise turned to disbelief or even rolled eyes. Repeatedly, the other five girls in the major and myself were picked last for group projects or given the lab notebook and told to take notes while the guys did the super cool things like lighting things on fire. I wanted to use a blow torch to melt things too! There was no blatant sexism, but that wasn't better. It was just understood by everyone, including myself. I was not successful completing my degree at Poly, although there were many factors that played a role in that unfortunate situation. Failing from this program was the first time I thought I might not be cut out for the 'whole engineering thing'.

Years later in 2016 I was fortunate enough to be given the opportunity to return to school and repair the wreckage I had made of my GPA at Allan Hancock. I worked hard, and I got myself back on track. I started realizing that I am still an engineer in my heart. I was able to get a position as a STEM Student Ambassador here at Hancock in January of this year, and it truly changed my life. I am able to reach young students that don't know anything about STEM fields and shine a light on the possible futures they could have. While I fully support any child to pursue a future in STEM, I have found myself really championing the little girls I meet. I see their curiosity and passion and creativity, and I see little Kirstens inside each of them.

Sadly, I also see little girls get really excited about demos we're doing and then suddenly act defeated, because they think STEM isn't for them. I talk to girls at college days and when I ask them what they want to do when they grow up, they say things like they like math but 'that's a guy thing'. I have realized through my job that while I love science and I am excited about my future in engineering, my passion is eliminating these silly barriers that women and girls alike put up between themselves and their interests because of societal restrictions, real or imagined, that limit their capabilities. I want little girls to get excited about science and realize that if I can do it, *they* can do it, too!

I am proud to say that I am transferring to Colorado School of Mines in January of 2019 as a Metallurgical and Materials Engineering major, which has the largest chapter of the Society of Women Engineers (SWE) in the country. I plan to increase my involvement in this movement of inclusion and in this encouragement of curiosity. When I was younger I dreamed that I would change the world with magic, and while I thought then that this magic would be all sparkles and fairy tales, I know now that this magic will be education, community involvement, and an intense passion for girls and women everywhere to know that they, too, have a home in STEM.

Did You Know?

Over the last six years, of all the MESA/STEM students served by the program ...

89% are under the age of 25

73% are male

68% are Hispanic

Thinking Forward

by Luis Rodriguez, Electrical Engineering major, MESA Student

When I was young, remote-controlled cars fascinated me and I questioned what made them go? How is it possible? As I grew up, newer and better technology was invented, and I started to answer my own questions. I knew what I wanted to study - to create cleaner and better technology for the planet and its people. Elon Musk, CEO of SpaceX and Tesla, is a brilliant inventor of whom I admire. He influenced my decision because he is creating pollution-free vehicles that don't contaminate the atmosphere and send useful equipment into space. He changed the space exploration program when he successfully landed the largest and most expensive component of a rocket, the first stage, back to earth. Thus, saving millions of dollars and is one step closer to his ultimate goal, sending people to mars.

I was a member of the Space Technology and Robotics Systems Academy (STARS) in high school. This academy gave me the opportunity to compete and win first place in KidWind's regional competition in Ventura, California. It was a renewable energy competition in which students created efficient wind turbines. We received a grant to compete in KidWind's national competition in Washington, DC. Judges liked our project and invited us back to present different projects that we have worked on in a booth at the Advanced Technological Education (ATE).

This experience showed me that there are no limits and anyone can change the world, including me. All it takes is an idea; even the "dumbest" ideas are the ones that solve the most difficult problems. I see this often in my work. Where I am faced daily with problems and it's up to me and my co-workers to solve. Usually the "dumbest" ideas are what gets the job done. I have been an employee of Mark Taylor Electric for the past two years. My duties are to troubleshoot non-working lights, switches, receptacles, maintenance industrial and commercial buildings as well as other problem-solving activities. Working in this field has definitely given me an insight about how electricity works and has made me wonder what changes are needed to increase efficiency.

I am now a certified associate user for SolidWorks Mechanical Design. I received the student award for excellence in advanced Technological Education from Lompoc High School. I am certificated in Computer Aided Drafting and Manufacturing (CADM) and I won the overall achievement for industrial technology also from Lompoc High School. Attending a five-week course at the University of California, Santa Barbara made me aware of all the different components that make a robot move because it focused on tools used in robotics and programming. In the fall of 2017, I was asked to tutor for calculus, chemistry, and physics. My goal in tutoring was to answer questions and eliminate any confusion about the material students struggle to understand.

The experiences I gained within the Wind turbine project, being an electrician and recent accomplishments have played a role in who I am today, but my failures in particular have been the biggest influence on me. As Thomas Edison once said, "I have not failed; I've just found 10,000 ways that won't work." They also taught me that no one will be knocking on your door to give you an opportunity which is why I joined The Mathematics, Engineering, Science Achievement Program (MESA) to pursue a degree in electrical aerospace engineering.

My parents have worked in minimum wage jobs in the vineyards ever since they migrated here to California. I am the youngest in my family, and I am the first generation to attend college in my entire extended family. I come from a low-income family which is why it is so difficult for me to attend a four-year university. I have been working and attending Allan Hancock College for the past three years. It has been a long and rough journey, but I will not let all the challenges I am facing stop me from receiving an engineering degree from California Polytechnic State University. This degree will make me one step closer to my ultimate goal; to help create better and more efficient renewable energy and be a part of the space program.



AHC MESA Students participate in annual STEM STUDENT WELCOME at UCSB

Thirty-two students and three AHC staff from Allan Hancock College's Mathematics, Engineering, Science Achievement Program (MESA) and Science, Engineering, Technology and Math (STEM) departments recently participated in an all-day field trip to UCSB to tour the campus and learn about the university's engineering majors and the transfer process. "There are a lot of resources available to students at UCSB that would be instrumental to my success!" said Andy Wittke, president of the Science and Engineering Club at Hancock, who is considering transferring to the university.



The event was funded by organized by college's National Science Foundation-sponsored Enhancing Success in Transfer Education for Engineering Majors (ESTEEM) scholarship program and was directed by Hancock alum and Executive Director of Office of Education Partnerships at UCSB, Mario Castellanos. "The personal connection between Mario and the college is a great collaboration," said Dorine Mathieu of Hancock's MESA program, "His personality, intelligence, and familiarity with the college and its programs allowed us to give our students a more personalized experience." UCSB also organized a resource fair that showcased research opportunities for students and provided information on financial aid and activities on campus that engage students. "UCSB gave me the impression that there are a lot of opportunities to gain experience in research and other things," said Hector Barahona, a Hancock mechanical engineering major and ESTEEM scholar. "I feel like UCSB is a great school for offering these opportunities."

My Personal Voyage

by Dylan Padilla, Physics major, MESA student

As a first-generation high school graduate and college student, the path I've taken to reach this point has not exactly followed a "traditional model." My path has led me to serve my country with the US Army and then later pursue the greatest of my academic goals, which is to study the fundamental laws of the universe. After exiting the US Army, my academic career got its start here at the Allan Hancock College and couldn't be happier with the growth I've seen as a student. I owe a good deal of my success to programs like MESA and STEM, because they offer guidance to people like me who haven't a clue as to where to start.

With the help from the faculty and staff here at Hancock, I've also gained this profound sense of passion for my major by immersing myself deeply into topics such as high energy physics and mysteries surrounding quantum mechanics; in doing so, I've learned that lower-division physics courses like classical mechanics have huge implications in the long run. For example, I learned the importance of simple harmonic oscillators after completing a lab experiment that involved describing the motion of a spring that oscillates up and down. It turns out that famed physicist, Paul Dirac, used the same simple harmonic oscillator to account for varying quantum states throughout the electromagnetic field, it was dubbed "the second quantization." By going on this personal voyage, I've not only become connected to my major at a deeper level, but I've also gained this sense of gratitude for the folks here at Hancock College for creating an environment that fosters intellectual growth.

As I wrap up my last year here at Hancock, I prepare by taking part in the UC/CSU application workshops offered by MESA so that I'm able to put together the best application that I'm capable of. My dream is to attend UC Santa Barbara and join their prestigious physics program and so long as I have my family here at MESA and STEM at Allan Hancock College by my side, I have no doubt that dream will become a reality.



The **Mathematics, Engineering, Science Achievement (MESA) Program** is an academic program that provides a wide range of support services and activities aimed at fostering student achievement and increasing the success and participation they experience while pursuing a degree in mathematics, engineering, computer science, biology, architecture, kinesiology, or other science-based programs. MESA enables students to prepare for and graduate from a four-year university with a math-based degree. It also seeks to increase the diverse pool of transfer-ready community college students who are prepared to excel as math, engineering and science majors. Through the program, students develop academic and leadership skills, increase educational performance, and gain confidence in their abilities to compete academically and professionally.



Visit our website at www.hancockcollege.edu; click on MESA under Quick Links

Fall 2018 MESA/STEM Activities

Sept. 13 — MESA/STEM Student Success “Start Here!” (5:00pm-6:30pm; G-106) Mandatory for MESA students

Sept. 21 — STEM Academic Strategies: Setting yourself up for success (1:00pm-2:30pm; W-23)

Sept. 28 — UCSB STEM Student Welcome Field Trip (8:00am-5:00pm)

Oct. 5-6 — MESA Leadership Conference Los Angeles (by invitation)

Oct. 12 — UC Admission Application Personal Insight Question Workshop (1:00pm-2:00pm; W-23)

Oct. 19 — Scholarship Strategies for STEM Students (1:00pm-2:00pm; W-23)

Oct. 17-21 — Field Studies in Eastern Sierra Nevada. Add PHSC 199 by Oct 3rd

Nov. 9 — Santa Barbara Foundation Scholarship workshop (12:00pm-1:00pm; W-18)

Nov. 9 — UC Admission Application Personal Insight Question Workshop (1:30pm-2:30pm; W-23)

Nov. 16 — Bridges to the Baccalaureate Fall Symposium. (1:00pm-3:00pm; G-106)

Nov. 30 — STEM Summer Internship Strategies (1:00pm-2:00pm; W-23)

Dec. 7 — CPSLO Campus Tour/Cannon Corp/SAES industry tour

UC/CSU Application Workshops

Oct. 5 — UC/CSU Application Workshop (1:00pm-3:00pm; W-23)

Oct. 10 — UC/CSU Application Workshop (5:00pm-7:00pm; W-18)

Oct. 25 — UC/CSU Application Workshop (11:00am-1:00pm; G-106B)

Nov. 2 — UC/CSU Application Workshop (1:00pm-3:00pm; W-23)

Nov. 13 — UC/CSU Application Workshop (10:00am-12:00pm; G-106B)

Nov. 19 — UC/CSU Application Workshop (1:00pm-3:00pm; W-31)

CSU/UC applications due November 30, 2018

