

# THE COMPASS

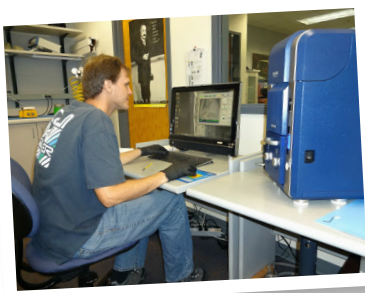
*Finding your way to an Engineering Career at SLCC*



## THE MAIN EVENT

Over the last five years the Engineering Department has been busy creating curricula in the exciting fields of Microscopy and Nanotechnology. These classes are intended for students who are working on degrees in Engineering or Science. They were designed with input from local and national industrial and educational partners to meet a growing need for qualified nanotechnology employees. The following new classes are now being offered.

### *Nanotechnology*



These courses provide students with skills in basic microscopy and nanofabrication procedures used to create a wide variety of nanomaterials. Students will become familiarized with the best safety and environmental practices used in Nanofabrication laboratories.

Through collaboration with the University of Utah and local area industries, these courses will introduce students to equipment common place in micro- and nanofabrication facilities.

In the Fall 2014 semester we are offering the following courses related to nanotechnology:

**ENGR 1050** – Introduction to Nanotechnology (PS) (3 credits)

This course introduces the basic concepts of nanoscience and explores how it is being used to change our world. No prerequisites!

**MSE 2900-001** (soon to be ME 2960) Foundations of Microsystems (1 credit)

This course will provide a “hands-on” introduction to the world of micro- and nano-systems for engineering, materials science, chemistry and physics students. No prerequisites, no homework and no tests (with the exception of a safety test)! It's an opportunity to build devices in the “machine shop of the future”.

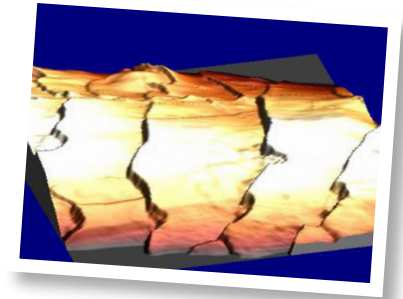
**MSE 2900-002** (soon to be MSE 2050) Nano II: Properties of Nanomaterials

This course teaches students numerous concepts associated with nanomaterial properties including: electronic structure, colloidal chemistry, magnetism, and photonics.

During Fall 2014 the following classes will be offered:

**MSE 2320** – Introduction to Scanning Probe Microscopy

Theory and practice related to the use of Scanning Probe Microscopes, including atomic force microscopes (AFM) and Scanning Tunneling Microscopes (STM). Students will create their own samples as well as imaging commercially available samples.



### *Microscopy*

These courses will provide students with skills in basic optical, electron and scanning probe microscopy techniques. Electron and scanning probe microscopes are powerful tools designed to generate topographical images and data on a wide variety of micro- and nanoscale materials. Students will learn basic skills using these instruments available in the SLCC microscopy lab.

Additionally, through a cooperative agreement with the University of Utah, students will get a chance to use research quality instrumentation at the Utah Nanofab.

**MSE 2330** – Introduction to Scanning Electron Microscopy

This course introduces students to the use of the Scanning Electron Microscope (SEM) in both standard and EDS mode. It includes both theory and practical applications.

Additional courses will be introduced during upcoming semesters to complete the course offerings necessary to develop certification programs. We invite you to join us in exploring these fascinating subjects. Interested students should contact Dr. Jim Smith ([jim.smith@slcc.edu](mailto:jim.smith@slcc.edu)) and/or Dr. Wesley Sanders ([Wesley.sanders@slcc.edu](mailto:Wesley.sanders@slcc.edu)) in the SLCC Engineering Department.



## ENGINEERS ON THE MOVE

There are a variety of different clubs and activities that SLCC students can get involved in. Student clubs offer additional types of educational opportunities that compliment the traditional classroom experience. One of the lesser known clubs is the SLCC chapter of the **Society of Women Engineers (SWE)**.

SWE represents a varied group of SLCC women students who are interested in engineering and other technical fields. With the recent increased number of women in SME's fields of study, a club that focuses specifically on the needs and interests of these women provides a great opportunity to enhance their full potentials in their chosen areas of study.

The Society of Women Engineers helps women to grow professionally as they get a chance to experience real world options in all fields involving science, mathematics and engineering. SWE also provides a wealth of scholarship and job opportunities for club members.

Last semester SWE's members toured the University of Utah's Nuclear Fission Reactor site to learn about the future of nuclear energy. This spring SWE members are looking forward to traveling to the Hoover Dam in Nevada to observe one of America's greatest achievements in engineering. Annual club membership fees are used to cover the expenses of these different journeys.

The benefits of being part of this club are not only to offer students support with their academic and professional careers, but it helps club members build long-lasting relationships with each other.

Why not become a part of this unique educational experience? We welcome all SME students, including males as well!

For more information about what SWE does and how you can become an active member of our club, contact Ashley Timmerman at [atimmer.swe@gmail.com](mailto:atimmer.swe@gmail.com) or at (801) 231-3953.

## PEOPLE MAKING IT HAPPEN

### Quentin McRae

Quentin McRay joined us as a full-time tenure track faculty member during Spring semester of 2012. When asked to describe himself, here are some experiences that he shared:

After growing up in a family with a bunch of boys who liked to blow stuff up, it seemed like there was a pretty obvious direction to take my career – Aerospace Engineering. So, after high school I pursued a degree in Aerospace Engineering and received my BS from the University of Arizona in 1997. Then I moved to Los Angeles to work in the defense industry, specifically on the guidance and controls of ICBM's (nukes).

After enjoying the sun and surf for a couple of years, I decided it was time to



move back to Arizona where I worked on laser guided bombs and guided missiles. At that time I also attended the University of Arizona where I received my Master of Science in Aerospace Engineering. I had the opportunity to support the flight tests of various weapon systems, which is just a

good excuse to blow up bigger stuff. It was great fun and the perfect job for me.

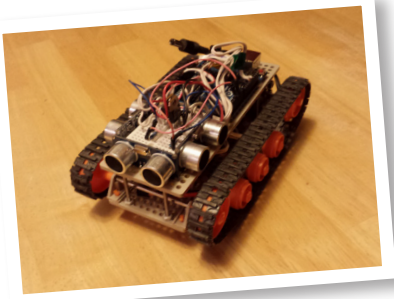
However, family eventually brought me to the great state of Utah, at which time I was introduced to the joys of teaching with my first job at Salt Lake Community College.

I really enjoy teaching here and I am continuously impressed by the caliber of students attending SLCC. The students' inquisitive minds cultivate interesting classroom discussions. I hope that my work with them enhances their commitments to higher education.

Recently I have turned some of my attention to the startup of the Bruin Robotics Club, where we are creating Arduino-based autonomous robots – much like what I did at my previous jobs, just without the "Bang!" at the end – we'll work on that ...

## The Bruin Robotics Club

The Bruin Robotics Club is one of the exciting new student activities that has just officially started. We are looking forward to all of the interesting projects and opportunities that the club will offer in the future. Our club members have already begun working on the first project, using Arduino microprocessors. It is a fascinating project that you would probably enjoy as much as we are! Are you interested?



The Bruin Robotics Club is for any and all students interested in furthering their knowledge in robotics, design, and programming.

The enthusiasm for our new club is spreading throughout the Department of Engineering as well as in other departments of SME. You are welcome to come see what is going on during the 1st and 3rd Thursdays of the month, and the 2nd and 4th Fridays. Visit us at [www.bruinrobotics.org](http://www.bruinrobotics.org) for the time and place. We often meet in SI 258. If you have any questions, you can contact the club advisor, Professor Quentin McRae, at [quentin.mcrae@slcc.edu](mailto:quentin.mcrae@slcc.edu).

## Merit Badge Pow Wow

The Engineering Department of Salt Lake Community College recently served as host to an Institute of Electrical and Electronics Engineers (IEEE) event. The Merit Badge Pow Wow for Boy Scouts of America's local Great Salt Lake Council sponsored this exciting program. The event was held on two consecutive Saturday mornings. Scouts chose from 7 different engineering related merit badges including Computer Science, Electricity, Electronics, Engineering,



Inventing, Radio, and Robotics. More than 200 scouts and their leaders participated. During the two day event, scouts were exposed to high tech STEM careers and the various educational pathways that lead to those careers. Members of the Utah Chapter of the IEEE served as the event planners and merit badge counselors. SLCC Electrical Engineering students provided one-on-one assistance to the scouts.

The merit badges were designed to provide experiences in different areas at a level the scouts were able to understand and enjoy. Participants had a wonderful opportunity to see what engineers do and learn how they can become engineers as well. Each of the classes emphasized the importance and relevance of things that the scouts are currently studying in school. In order to complete the badges, the students were required to demonstrate how math and science are applied to make robots, computers, cell phones and many other products.

## The 2<sup>nd</sup> Annual SME Symposium



We are happy to announce that registration for this year's Symposium is open! We are expecting that the second year of this event will have an even larger number of participants and more opportunities for winning monetary awards.

If you are interested in participating in our upcoming event, please see our website for all of the information: <http://www.slcc.edu/sme/symposium>.

Also, feel free to contact Dr. Sally Asbell if you have any questions – 801-957-4549.

## Meet Our New Advisor: Devan Church

Devan Church joined the School of Science, Mathematics and Engineering late last summer. Now that he's settled in we asked him to share a little bit about himself.

As the advisor for the School of Science, Mathematics and Engineering at Salt Lake Community College, Devan encourages students to think critically about their educations. This means determining a choice of major, considering transfer options and thinking about career choices. He has followed an interesting education and career path himself.



Devan is a jazz guitarist who has played at many clubs and venues around the valley, including the Grand America Hotel and the Red Door Saloon. After earning his BA in Gender Studies he came to work at SLCC just over 3 years ago. His initial assignment was in the Computer Science and Information Systems Division. His choice of career is motivated by his belief that everyone should have access to higher education – and that the community college, as an institution, is a perfect stepping stone for students.

Devan looks forward to meeting each of you. His office is in the Science and Industry Building, Room 209. He invites you to "swing by" anytime for a walk-in appointment – or just to say 'hi'. He posts his hours weekly, and if you would like to make an appointment, call 801-957-4978.

Devan is truly committed to helping students reach their education goals, and is up-to-date on the transfer issues that will affect you in the future. Take advantage of his expertise!



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## COMMENTS FROM THE COORDINATOR



Welcome back to Spring Semester from the Engineering Department. I'm sure you all enjoyed some well deserved time off after a busy Fall semester. Believe it or not it will soon be time to register for Summer and Fall terms, either here at SLCC or at your destination 4-year university. With that in mind I want to share some advice, which may be of help as you plan a 'doable' future semester.

Several years ago a valued friend and faculty advisor from the ME department at the U of U (Dr. Jim Strozier) introduced me to an algorithm for calculating reasonable student loads. He asserted that each week you only have about 60 productive hours to devote to work and school. You can do more for a week or two

at a time, but for the long haul 60 hours is about all most of us can handle.

In order to do a good job in your Engineering classes you need about 2 hours outside class for every hour in class. We can use this rule of thumb to calculate how many classes constitute a reasonable load. First subtract the number of hours you work each week from 60, then divide the result by 3 (1 hour in class plus 2 for studying) – which gives you the number of weekly contact hours you can handle in classes.

For example...

Assume you work 30 hours a week. Sixty minus 30 gives us 30 hours for school. Divide by 3 to give 10 weekly contact hours in class – so 3 or 4 classes is a reasonable load. Don't forget that many of our classes meet for more hours than the credit assigned... for example Strengths of Materials is 2 credits but meets for 4 hours a week. So... a reasonable schedule might be:

MEEN 2140, Strengths	4 contact hours
MEEN 2020, Dynamics	3 contact hours
MEEN 2450, Numerical Methods	3 contact hours
Total	– 10 contact hours

Here's another example. Assume you are one of the lucky ones who can go to school full-time. Our algorithm suggests that you could take up to 20 contact hours of classes, for example (Don't forget to count the labs!):

EE 1270, Circuits	6 contact hours
MATH 1220, Calc II	4 contact hours
PHYS 2220, Physics II	4 contact hours
CSIS 1600, C programming	3 contact hours
English 2100, Technical Writing	3 contact hours
Total	– 20 contact hours

Similarly, if you are working full-time,  $(60 - 40)/3$  gives us approximately 7 contact hours – which means that the EE 1270 class is plenty for your load.

If you try to do too much something has to give, either in your personal life or in your academic results. Over the years I've talked to many struggling students, who have attempted impossible loads... and then felt like failures when they didn't perform well. Hopefully this very 'Engineering' approach to designing a schedule will help you set attainable goals which may be helpful as you plan.

— Dr. Holly J. Moore

***If you talk about going to the moon, they call you a poet. If you actually go there, they call you an engineer.***

— anonymous

### Many Thanks

We would like to thank

Dr. Sally Asbell and Mr. Anton Shpakovskiy for a job well done! We also want to commend Dr. Holly Moore for her patience and support of this Spring edition of The Compass.