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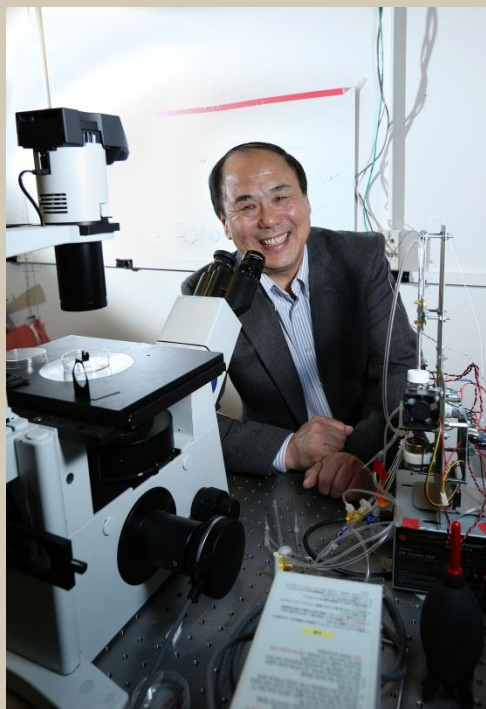
Hello S&T Instructors -- Welcome back to campus and a busy fall semester. In addition to new structures on the landscape, there are many new faces with dozens of new faculty arriving as well as a new provost and two vice provosts and deans. Read about a recent [interview](#) with Drs. Ferguson and Roberts as well as discover interesting facts about some award-winning colleagues.

**CERTI
NEWSLETTER**

Center for Educational
Research and Teaching
Innovation at Missouri S&T

Passing On the Gift of Mentoring

Yinfa Ma, Curators' Teaching Professor of chemistry at Missouri S&T, has a CV littered with awards and accolades, publications and patents, yet as a young man he never aspired to be more than a rural farmer in his homeland of China. That is, until his life was turned upside down in 1977.



It was three years after he had completed high school when the decade-long Cultural Revolution in his country ended. A visit from his former high school math teacher, Mrs. Liu, riding into his village on her bicycle with an urgent message, challenged everything he thought about his future.

"Students are now being accepted into the university through an entrance examination system, and I want you to apply," she told him. "Of the whole class, you are the only person I can think of who can pass the entrance exam. Yinfa, you have to take the exam!"

Less than one person in a thousand in his region would be chosen, with the formidable exam covering physics, chemistry, math, politics and language. Ma,

at age 23, served as the planner for the collective farms of five villages in addition to being a farmer himself. Higher education was not on his radar.

It was only at the math teacher's insistence that he half-heartedly studied using her old textbook, and then reluctantly took the test. Mrs. Liu's estimation was correct. He passed the exam and entered Zhengzhou University where he earned his bachelor's degree in chemistry four years later. He became a full-fledged faculty member with only an undergraduate degree -- not unusual at the time due to the urgent need of college educators across the entire country.

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Give Us Your Suggestions

Is there an instructor you would like to see featured in the CERTI newsletter? What about a teaching technique that you have found to be helpful? Email your ideas to [Diane Hagni](#) for consideration for future newsletter issues.

New challenges

Ma was thrilled to be teaching students his beloved subject of chemistry and planned to do that for the rest of his life. Then, a few years later, another mentor urged him to apply for a graduate position at Iowa State University. Again, the odds were against him. He struggled with English, having begun to learn it only a few years earlier, and he had to pass several required tests in addition to the TOEFL to be chosen to travel to America. The mentor's belief in him prevailed once again, though, and four years later Ma had earned two Ph.D.'s at Iowa State, one in analytical chemistry and a minor Ph.D. in biochemistry.

The common thread in his life – mentors who believed in him and pushed him to go beyond what he thought possible – surely has been replicated through his own life as countless students and other faculty members have experienced the benefits of his tutelage. Last spring, Ma was honored with the University of Missouri System President's Award for Mentoring, marking his 24 years of believing in others and developing them to their highest potential in the classroom and laboratory.

Ma's first love continues to be teaching, although he prefers to include that term under the broader label of *mentoring*. "You teach knowledge," he says. "In mentoring you work with the students on how to attack a problem." Ma tries to link learning to each person's motivation and goals. A student asking for help on homework may hear Ma say, "Let's put the problem aside. Let's think about why you need to take this class. What will you need for your future and what you want to be?"

Handling chemistry-haters

Ma taught the gateway chemistry class at S&T for nine years, primarily to freshmen. He would begin his first lecture saying, "How many of you hate chemistry? Raise your hand." When a third of the class or more indicated their dislike, he would issue a challenge: "If you can convince me that your future career does not have a link with chemistry at all, you will automatically get an A in chemistry." No one took him up on his challenge, but he was successful in getting students to see the value of what they learned in his class.

Ma held sessions similar to LEAD (Learning Enhancement Across Disciplines) before he knew there was such a program. During his 11-year stay at Truman State, which was his first faculty position after his doctorate, he connected with students by offering evening sessions in classrooms to go over problems with whoever showed up.

"I put students in groups to discuss problems and then discussed them on the board," he said. "I would give prizes and have competitions. I built an environment for students to come and learn. I found out that when you can generate interest, they won't be bored; they will spend the extra time. Just work with them."

Ma compensated for his still-developing English skills by using the chalkboard to write profusely so he could communicate as clearly as possible. He won all of the teaching awards Truman State offered, including the most prestigious one the campus offered, Educator of the Year, in 1996.

In moving to S&T in 2002, Ma continued with his love of teaching/mentoring students and added cutting-edge research in cancer detection. (cont. on p. 3)



Faculty Development Events for Fall

Here are the CERTI-sponsored faculty development events for fall 2014 that are part of S&T's Teaching and Learning Excellence Series. All instructors are welcome. RSVP to [Diane Hagni](#).

Curators' Teaching Summit: "Great Expectations: Bridging the Gap Between Instructor and Student Expectations."
Noon-1:30 p.m., Sept. 17, Oct. 13 and Nov. 12, Havener Center; lunch provided.

"The Role of Non-Tenure-Track Faculty on Campus"
3-4:30 p.m. Sept. 29, St. Pat's Ballroom C, refreshments provided.

"Extreme Syllabus Makeover": A Faculty Learning Event
Noon-1 p.m., Oct. 3, Meramec/Gasconade Room, refreshments provided.

"Making Group Work, Work": A Faculty Learning Event
Noon-1 p.m., Oct. 31, Meramec/Gasconade Room, refreshments provided.

Mentoring faculty

When he was awarded the Curators' Teaching Professor designation in 2006, Ma began mentoring younger faculty who asked for his assistance, especially international faculty. Some of his mentees have benefited to the extent that they are now award-winning teachers themselves, such as Xiaoping Du, who was recently promoted to full professor of mechanical and aerospace engineering.

Ma has distilled his time-tested experience into a few skills that can be easily implemented in the classroom: First: Slow down! "For the first two weeks of class, do not rush," he tells instructors. "Make sure students can understand."

Secondly: Be organized! Students should be able to follow a logical pattern in the course and not have surprises in class that are not already laid out in the syllabus, he says.

Thirdly: Get feedback! He likes to ask his students for anonymous feedback about a month into the semester. How do students feel about the class? How can it be improved? He uses student feedback to modify what he is doing instead of waiting until the end of the semester to make changes. "If you find out you are a non-effective teacher (at the end of the course), it doesn't do you any good."

Finally, he encourages instructors to adopt a positive attitude. Ma's boundless enthusiasm is one of his most notable attributes. In class, he tries to point out what students are doing well rather than focusing on students who aren't meeting his expectations.

Ma says he still visits Mrs. Liu when he returns to his homeland. She cries when she sees that her mentee has gone far beyond what she could have imagined. Like his mentor, Ma wants to be a catalyst for change for those he influences and see them exceed his wildest expectations.

(Go [here](#) for an article about other S&T faculty award-winners of the 2014 UM System President's Awards.)

Educational Research Mini-Grant Projects Funded

Four educational research projects developed by Missouri S&T faculty have been funded for 2014-2015 as part of a mini-grant program co-sponsored by the Office of the Vice Provost for Academic Affairs and the Center for Educational Research and Teaching Innovation (CERTI). The Academic Affairs office provided \$22,000 in funding in this the fourth year of the program.

The 2014-2015 funded projects are:

- "Assessment of Textbook-free Courses in the Biochemical Engineering field as Vehicles for Lifelong Learning," Daniel Forciniti, professor, biochemical engineering, \$4,720.
- "Improving Understanding of Academic Integrity Among Undergraduate Students in STEM Fields" Amber Henslee, assistant professor, psychological science; and Susan Murray, professor, engineering management and systems engineering, \$8,000.
- "Development of a Conceptualized Guided Coding for the Course of Mathematical Foundation of Finite Element Methods," Xiaoming He, assistant professor, mathematics and statistics, \$4,732.
- "Implementing Guided Group Activities to Improve Performance and Self-efficacy in College Algebra – Stage 2," Kimberly Kinder, assistant teaching professor, mathematics and statistics, \$4,500.

For more information about the educational research mini-grant program, or to see reports of previous mini-grant projects, go to <http://certi.mst.edu/educationalresearch/>.

Distance Faculty Receive Teaching Excellence Awards

Thirteen Missouri S&T instructors were honored as outstanding distance educational faculty last spring.

Global Learning 2014 Outstanding Teaching Commendation Award recipients are:

Kwame Awuah-Offei, associate professor of mining and nuclear engineering;

Ronald Carson, associate adjunct professor of engineering management & systems engineering;

Deandra T. Cassone, associate adjunct professor of engineering management & systems engineering;

Sriram Chellappan, assistant professor of computer science;

Mao Chen Ge, associate professor of mining & nuclear engineering;

Jennifer Leopold, associate professor of computer science;

J. David Rogers, Karl F. Hasselmann Missouri Chair in Geological Engineering and associate professor of geological sciences & engineering;

Life had some unexpected turns for Joe Stanley ...

But this is how he rolls



Things could have all turned out very differently for Joe Stanley. A string of seemingly unrelated incidences converged in his life at just the right time to turn a would-be CPA into an award-winning electrical

and computer engineering associate professor at Missouri S&T.

Stanley was three years into his accounting degree at the University of Missouri-Columbia, located in his hometown, before he took an engineering class on the advice of his cousin's advisor. "He talked me into it," Stanley said.

"It" turned out to be a statics class, which was engaging enough for the math enthusiast to change his major to engineering. Graduating in five and a half years summa cum laude, he received his bachelor's degree in electrical engineering and had a job in industry lined up. Tragically, his sister was murdered the night of his graduation, and he decided to turn down the job in order to remain in Columbia with family.

He continued with his education at UMC, and, while working on his M.S. in electrical engineering, he found out about a fairly new medical informatics degree program. It was one-third medical school and two-thirds engineering, which turned out to be a perfect fit for Stanley. He earned his Ph.D. in computer engineering and computer science in 1998. His research specialty is in developing software to analyze medical images which provide help in decision-making for medical diagnoses.

Originally, Stanley was going to accept a position at Creighton University, but his plans were again upended at the last minute, and he found himself with an assistant professorship at Missouri S&T in 1999 instead. With no teaching experience – he had never taught a class as a graduate student – and no idea what comprised course preparation, he did what any other novice would do: "I read a textbook on a beach at Lake Michigan the summer before classes," he said.

Help is on the way

Understandably, the first three or four semesters in the classroom were not especially inspiring. Then, 10 years ago, he asked his wife, Candy, a former K-12 science teacher, to observe his classes. "I'll never forget when she

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Michael S. Schmidt, lecturer in engineering management & systems engineering;

David Spurlock, lecturer in engineering management & systems engineering;

E. Keith Stanek, professor emeritus of electrical and computer engineering.

Global Learning 2014 Outstanding Teaching Award of Excellence recipients are:

Andrew C. Blair, lecturer in mining and nuclear engineering;

Lokesh Dharani, Curators' Professor of mechanical & aerospace engineering;

Robert G. Landers, professor of mechanical & aerospace engineering.

Fall 2014 Calendar of Faculty Events

The Fall 2014 Calendar of Faculty Development Events is now available online and includes events sponsored by New Faculty Programs, Educational Technology, Undergraduate Advising Office, CERTI and other campus offices.

video-taped me,” he said. “She was frantically taking notes.” Candy made some simple suggestions, such as “make eye contact,” and “write on the board where students can see it.” Simple, but effective recommendations apparently. The next year he won his first teaching award. Altogether he has won seven teaching awards since 2004.

He also credits his students’ input for improving his teaching dramatically. The majority of students in his computer engineering 111 and 213 classes are sophomores and juniors, and come from outside of his department. “The last thing they want to do is get close to computer hardware,” he says about his required courses. “I have to relate what I know to people who are not familiar with my area.”

He finds out in detail what students struggle with when he facilitates the computer engineering LEAD sessions (Learning Enhancement Across Disciplines) each week, something he started doing about 10 years ago.

“Students that come to LEAD are not necessarily ‘A’ students,” Stanley says. “I learn how to relate the material for students who are not doing as well. It helps me look at problems with my own teaching.”

Stanley finds out if his teaching philosophy is working when he asks students in the back of the 55-plus-member class, “Are we OK?” and is able to elicit a response from normally disengaged students. He often invites students to let him know what they don’t understand: “You’re paying for the class,” he tells them. “Don’t be afraid to ask questions.”



Teaching Adult Learners

Stanley has served as an affiliate professor for summer training for the Project Lead the Way program, which offers engineering classes to middle and high schools throughout the nation. S&T is the Missouri affiliate for training the instructors of these

classes, with S&T faculty providing intensive summer training modules. Stanley says he has had to hone his teaching style to provide the same material he gives his undergraduate students to older adult learners, only in a much shorter time span.

As his teaching expertise has continued to develop, Stanley has also remained involved in research. He has collaborated with the National Library of Medicine for the past 13 years. He also has been awarded a patent with several other S&T faculty on the automatic detection of critical dermoscopy features for malignant melanoma diagnosis.

In his off time, you will find him at The Centre exercising extensively to fend off arthritis in his knee, which was operated on 20 years ago. He also enjoys getting to play golf when he can. His daughters’ involvement in community theater earns him ushering duties at various productions of Fine Linen Drama and Ozark Actors Theater, where Kaylee, 11, and Paige, 6, are active. An ongoing passion of his includes serving in a backpack feeding program for elementary-aged children, where he has seen tangible benefits from helping others.

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Five S&T Faculty Members Receive UM System Awards

Congratulations to five S&T faculty members who were UM System President’s Awards recipients in 2014. President’s Awards are the highest honor bestowed by the University of Missouri System for excellence among the four mission areas of teaching, research, service and economic development. In total, 11 awards were presented system-wide.

The winners are:

Mariesa Crow, F. Finley Distinguished Professor of electrical engineering, who received the President’s Award for Leadership. This award recognizes faculty who have provided exemplary leadership for one of the four UM campuses through commitment to excellence and integrity in their leadership roles.

Larry D. Gragg, Curators’ Teaching Professor of history and chair of S&T’s history & political science department, who received the Thomas

New Vice Provosts & Deans: Their Thoughts on Teaching and Learning



A Scotsman who quotes Kierkegaard and a motorcycling fly fisherman who specializes in entomology. They are a study in contrasts: Dr. Ian Ferguson (shown above left), vice provost and dean of the College of Engineering and Computing, and Dr. Stephen Roberts (right), vice provost and dean of the College of Arts, Sciences and Business, arrived less than a month apart on the Missouri S&T campus this summer. The two will be leading the newly formed colleges, birthed simultaneously under the campus reorganization plan.

While they should have been breathless from being immersed in their new duties, they were gracious to do an interview with CERTI discussing their perspectives on teaching, learning and related topics. Below are some excerpts from that conversation.

On teaching philosophies:

Ferguson: I would say my job is to educate and not to train. You educate people for a career, but you train them for a job. If they only have a finite skillset when they leave S&T and get a job, we have not done them any favors, because they don't have the necessary skill set to transition into other positions as their career develops. In some sense, we are trying to help the students understand who they are. It's not just about what subjects they are coming to do, but helping them understand how they are wired. Where do they really fit to excel?

Roberts: I try to weave together perspectives from different disciplines, and I think students tend to enjoy that. I always try to draw parallels to the human condition or the human experience. Recently I read about an interesting analogy to teaching – how it is a bit like downloading software. The important piece is not just getting the software into them, but after you've downloaded software, getting them to

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Jefferson Award. This award recognizes faculty who rise above excellence and demonstrate clear distinction in teaching, research, writing, creative activities and service to the University of Missouri and humankind.

Curt Elmore, professor of geological engineering, who received the President's Award for Cross-Cultural Engagement. This award recognizes faculty who promote cross-cultural engagement through education, research and service.

Richard Dawes, assistant professor of chemistry, who received the President's Award for Early Career Excellence. This award recognizes faculty who exhibit exceptional promise within their first seven years with the university as demonstrated through scholarship, research or creativity.

Yinfa Ma, Curators' Teaching Professor of chemistry, who received the President's Award for Mentoring. This award recognizes faculty who have provided exemplary mentoring to fellow faculty members.

synthesize and accomplish complicated tasks. Once they've got the content mastery or knowledge, we want students to be able to use and apply that knowledge to the solution of complicated problems or complex tasks.



On the balance between teaching, research and service:

Roberts: In the practical aspects of being a faculty member, there is a tension between research and teaching obligations because there is a finite amount of time. You have to do everything reasonably well, and many things you have to do very well. To go back to a biological analogy, great working social groups succeed based on the ability of individuals to specialize on tasks. The parallel I'm trying to draw here is that people succeed in this balance

when they work to their strengths and they work to their passions. Even though, again, everything has to be done to some standard of quality and quantity, people do tend to derive the most satisfaction and be the most successful when they work to their strengths.

I would also add the relationship between teaching, research and service cannot be classified only as antagonistic with tension among the three. The reason I say this is because very, very often the most engaged, active researchers I interact with are often the best teachers. I would say that there is a synergy that the two yield that far outweighs any tension between the two.

Ferguson: An institution such as this is, first and foremost, an undergraduate teaching school, so we can't lose sight of that mission statement. By the same token, we have to see value in each element of this mission, value in the teaching, and value in the research. And an institution like this wouldn't survive unless people were willing to serve. As people move into these roles, they should be supported. The faculty are the engine; they are the people who make things go. If you don't take care of the engine, then nothing is going to happen.

On helping students understand how to learn:

Ferguson: I saw three things for success that I tell students make a difference. Typically, there is a grade point average difference between people sitting at the front of the class and the back. The second thing is that once you miss about 15 percent of the class, you typically drop a grade point average. The third thing is for students to find the brightest person in class and work with that person because there is a correlation between people's understandings. Student understanding is limited to their own interaction; that's why it's also useful to go talk with the faculty member.

Roberts: There are some time-honored techniques that I encourage among students. Once they are exposed to some content, I have them write about it, even if it is a rewriting of the material, but ideally with some reflection or

application to their own lives. I tell students that those who perform best on assessments, who have the highest learning outcomes and the most personal satisfaction with a course or material, are those who personalize it and then teach it to others.

On evaluating instruction:

Roberts: They (end-of-course evaluations) have some value. In my mind, their primary value is to provide reasonable and constructive feedback and criticism to an instructor for improving a course. They are sort of famous tools used in personnel decisions of faculty. I think that in many places, there is probably an overemphasis on the weight of student evaluative tools. At CMU (Central Michigan University, Roberts' previous institution), many departments weighed more heavily a professional peer evaluation of teaching. A team of peer evaluators and instructors would visit classes and provide very meaningful feedback. That feedback, the faculty member's responses to that feedback, and the outcomes from subsequent courses were used in developing a far more useful tool -- a teaching portfolio or dossier which included more than just tables and graphs of student-reported data.

Ferguson: If we don't evaluate or analyze, we're lost. If we don't analyze ourselves with an aim to improve, people around us will do that for us. And by their metrics, we may be found wanting. (On the end-of-course evaluations) some of the comments that come from the students might be more useful than the grades. You have to be careful. I say to the faculty, "Look at the Two Sigma." The (student) comment that tells you that, "The sun shines when this person talks," typically doesn't have any content to it. Neither do the crass comments. If you want to see what's there, take out the top and bottom, and the 66 percent in the middle typically tells you what is useful.

The faculty are the engine; they are the people who make things go. If you don't take care of the engine, then nothing is going to happen.

--Ian Ferguson

S&T's vice provost and dean of the College of Engineering and Computing

On how instruction is delivered:

Ferguson: I think we are in a time of transition just now and I think we're all trying to understand what was useful in the past, and what we could not develop in the past because those technologies didn't exist. But to say all was poor (in the past) is to negate our own educational experience, in some sense. eLearning has certain weaknesses. But when I look at my kids, when they want to do something, they're on YouTube, they're on other forums. In eLearning, we're looking at fragmented models with people doing things for 10 minutes here and 10 minutes there. We might want to see how this pertains to lecture.

Roberts: I see a positive but progressive march towards incorporating more useful technologies for blended courses and enhancing courses through significant online and electronic components. I think the process is evolutionary and iterative. We're distilling efficiencies and effectiveness into the use of those technologies every year, and so I think those approaches are in their infancy. I think there's tremendous potential in greatly improving the learning experience, the engagement and the outcomes of students using those technologies. In general, I am positive and enthusiastic about distance and eLearning. I don't think it's the perfect platform for all courses and all disciplines, but I think in many cases it's very, very useful.