Citizens in and around Rapid City will benefit from engineering projects designed to solve real-world problems through a new undergraduate honors program at the South Dakota School of Mines & Technology.

Students accepted into the SD Mines Honors Program starting next fall will be part of teams of future engineers and scientists who complete one or more community projects during the course of their degree.

Each year about 5 percent of the incoming freshmen class, or about 30 exceptional students, and some highly motivated sophomores will be accepted into the program. As a result, dozens of science and engineering projects benefitting the community will be tackled within a few years.

Mines seniors have long been tasked with design projects that benefit the community – everything from developing adaptive equipment for people with disabilities to assessing and fixing the drainage around the Black Hills Playhouse, to designing and building a greenhouse, to writing software for the Dahl Museum.

The new South Dakota Mines Honors Program will build on this concept and get students involved earlier in community-based project leadership. This project-based approach is complemented by an array of leadership and professional development opportunities to round out the rigorous academic program at Mines.

“To our knowledge, no other university offers an honors program quite like this. Over time, the engagement of teams of engineering and science students each semester on problems that matter to the community will make Rapid City an even better place to live,” said South Dakota Mines President Heather Wilson. “It will also provide a great added benefit for exceptional students to develop as leaders in engineering and science, solving real-world problems.”

Four projects currently underway illustrate the kinds of projects that Mines students will be engaged in. Mines students are:

- Designing facilities and developing a site plan that focuses on problem areas such as drainage issues, road/trail access and maintenance of a fruit tree orchard for Youth and Family Services Fullerton Farm in Box Elder.
- Designing an ecologically sound wastewater treatment system and a conceptual master plan for the Rosebud Economic Development Corporation.
- Designing drainage, lighting and other facilities upgrades at the Rushmore Little League baseball complex.
- Building a system to test reliability and improve design of low-cost, robust wheelchairs for the humanitarian, faith-based nonprofit Free Wheelchair Mission, which provides wheelchairs for free to people with disabilities living in developing nations.

The science, technology, engineering and math degrees offered at Mines are already challenging. Students get personal attention in small classes, and 75 percent of Mines students would qualify for the academically oriented honors programs at most universities.
“This new honors program will offer an exceptional cohort of students the opportunity to develop leadership and problem-solving skills while working on real-world problems in our community,” Wilson said.

To graduate from the SD Mines Honors Program students will:

- Have four semesters of community-based project leadership experiences.
- Participate in four honors experiences intended to broaden a student’s perspective and develop their ability to understand and tackle the most difficult problems of the 21st century.
- Serve at least two semesters in an elected or appointed leadership position in a club, team, organization, professional society, fraternity or sorority, or hold an analogous or more significant leadership position as determined by the Dean of Students.
- Complete the Mines Advantage professional development program.

The university has established a community advisory board, which will meet for the first time on Dec. 20, to help identify suitable problems for Mines students to work on, as well as recommend other honors experiences. Advisory board members may encourage and solicit community organizations to submit potential projects.

All students who are applying as freshmen to SD Mines for the class entering Fall 2017 will have an opportunity to apply for the honors program. Selection will be competitive and based on academic excellence, commitment to service and leadership potential. Honors program students will have the option of living in the honors section of the university dormitories. Honors program students will also have preference for on-campus housing as upperclassmen.

The hoophouse is a food sustainability project that offers students access to healthy food options and could potentially become a profitable produce market for the surrounding community.
Amity Shlaes, best-selling author and journalist who has written for Bloomberg, Forbes, The Wall Street Journal, and National Review will deliver the address at the South Dakota School of Mines & Technology 174th commencement ceremony.

The ceremony will be at 9 a.m. Saturday, Dec. 17, at the Rushmore Plaza Civic Center Theatre. An expected 169 Doctor of Philosophy, Master of Science, Bachelor of Science and Associate of Arts degrees will be awarded.

Shlaes is a biographer of the 30th United States president, Calvin Coolidge, who had a strong connection to the Black Hills. Among Shlaes’ four New York Times best-selling books is Coolidge, a full-length biography, which details the summer of 1927 when President Coolidge and First Lady Grace Coolidge spent three months in the Black Hills. President Coolidge dedicated Mount Rushmore on Aug. 10, 1927.

She chairs the board of the Calvin Coolidge Presidential Foundation, a national foundation based in his birthplace of Plymouth Notch, Vt. The Coolidge Foundation gives the Coolidge, a full-ride merit scholarship to any American college.

Shlaes graduated magna cum laude from Yale University with a bachelor’s degree in English. She is the author of three other New York Times bestsellers, The Forgotten Man: A New History of the Great Depression; The Forgotten Man: Graphic, a full-length illustrated version of the same book drawn by Paul Rivoche; and The Greedy Hand: How Taxes Drive Americans Crazy. National Review called the Forgotten Man “the finest history of the Great Depression ever written.”

She is winner of the Hayek Prize and currently chairs the jury for the prize. She has twice been a finalist for the Loeb Prize in commentary. In 2002, she was co-winner of the Frederic Bastiat Prize, an international prize for writing on political economy, and later chaired the jury for that prize. In 2003, she was the JP Morgan Fellow for finance and economy at the American Academy in Berlin. Over the years she has served at the Council on Foreign Relations as a senior fellow in economic history and the George W. Bush Presidential Center, where she was one of four directors working on an economic program.

Shlaes currently serves as Presidential Scholar at the King’s College, where she teaches about President Coolidge. She also writes for Forbes and National Review.

She will be awarded an honorary doctorate at the commencement.
SD Mines has named its unique industrial-scale chemical engineering teaching laboratory in honor of Gary Veurink, a prominent alumnus who, with his wife Ruth, has established an endowment to help prepare chemical engineering students for their careers.

The gift will provide monies for continuous upgrade of experiments and to infuse future innovative technologies into the 5,000-square-foot Veurink Chemical Engineering Unit Operations Laboratory. It will also fund the prestigious Gary and Ruth Veurink Scholarship, which will cover at least half a student’s annual tuition and fees.

The lab features a two-story distillation column and other pilot-scale equipment similar to what chemical engineers use in industry. It is one of the few pilot-scale unit operations laboratories on campuses.

Veurink, a 1972 alumnus, joined Dow Chemical Co. and rose through the company to become a corporate vice president with direct responsibility for Dow’s global manufacturing and engineering operations and all new capital projects. This included a 23,000-employee organization with more than 150 manufacturing sites in 39 countries, as well as an annual $4 billion operations budget and a $2 billion plus new-projects budget. He retired after 35 years. Following his retirement, he spent six years as chief operating officer at Washington, D.C.-based International Justice Mission, a human rights agency that works to protect the poor from violence.

“The Chemical Engineering program at Mines is exceptional, in part, because of the generous contribution by the Veurinks. This teaching lab and scholarships to help our students make a tremendous difference, and we appreciate their generosity,” said Heather Wilson, president of South Dakota Mines.

“We feel quite strongly that SD Mines was a critical aspect of our lives, and we want to express our gratitude in a tangible way to the institution and be active in highlighting that the institution was instrumental in our lives,” Veurink said.

Gary Veurink continues to be active on several boards in Holland, Mich., and mentors younger leaders, including those at the International Justice Mission.

More than 20 industrially relevant experiments are conducted in the laboratory, which was originally built in 1957 to aid the accreditation of the university’s chemical engineering program. It was completely renovated six years ago.

For the past five years, 100 chemical engineering graduates from SD Mines have been hired into industry, with LyondellBasell, Cargill and Dow Chemical the top employers.

Companies hiring multiple Mines chemical engineering graduates between 2011 and 2015 include Baker Hughes, Applied Control Equipment, Freeport McMoRan, Archer Daniels Midland, 3M, POET, South Dakota Department of ENR, Nutra-Flo, Lafarge, Burns & McDonnell, Raven Industries and Tate & Lyle.
The South Dakota Space Grant Consortium affiliated with NASA has awarded the South Dakota School of Mines & Technology a $25,000 Project Innovation Grant to promote STEM education by using astronomy to engage K-12 teachers and students in math.

Math professors will lead the comprehensive program to increase interest in the fields of engineering and science necessary in developing the nation’s workforce.

The project is the direct result of a request among teachers for professional development opportunities through South Dakota Mines. The project includes three components: several two-day computational astronomy workshops for teachers; bi-weekly computational astronomy sessions for middle and high school students; and night sky exploration for students. It will be open to students and teachers from Rapid City and neighboring school districts.

“Several of our math faculty members happen to be really good amateur astronomers. When teachers told us they wanted more content-rich professional development opportunities, the faculty put together a program that looks interesting and fun for both teachers and students. If this is well received, we will keep working with teachers to try other things like this in the future,” said South Dakota Mines President Heather Wilson.

The project stems from a planning meeting Wilson, Mines Provost Demitris Kouris, Ph.D., and other Mines faculty had with area K-12 educators last fall.

The workshops for K-12 science and math teachers will connect specific mathematics computational models to astronomy and space exploration, with the goal of taking it back into the classrooms.

Among the advanced topics for teachers: the solar system, Kepler's laws and historical discoveries; computation of planetary masses, light speed and distances within the solar system and beyond; applications to man-made satellites; and the nature of light and the electromagnetic spectrum.

Teachers will also have the opportunity to participate in night-sky telescopic observations during the workshops. The one-credit course can be used for professional advancement and recertification.

Three two-day workshops will be offered in April 2017, October 2017 and March 2018. Tuition is paid in full by the grant funds. Each workshop can accommodate a maximum of 15 teachers. Registration for the first workshop will open in January 2017 through the South Dakota Mines website.

The computational astronomy course for middle and high school students will be offered at the South Dakota Mines campus every two weeks throughout the school year starting next fall. The goal is to instill an interest in space exploration through understanding applied math.

Students may register online through the university’s website at the end of May 2017. Each session is two hours.

In September 2017, middle and high school students and their family members will have the opportunity to participate in night-sky exploration. The evening will begin with a two-hour math preparation, hands-on activities in computational astronomy, and will be followed with night sky telescopic observations. The goal of the September session is to spark students' desires to attend the bi-weekly sessions during the school year.
A SD Mines computer programming team is headed to the International Collegiate Programming Contest's (ICPC) World Finals after recently placing second among 231 teams regionally. This marks the seventh time the university has been invited to compete internationally.

The SD Mines team of Alex Iverson, Matthew Dyke, and Matthew Schallenkamp will advance to the 2017 ICPC, which will be held this May in Rapid City.

“Only 20 teams nationally go to the world finals each year. This is the 7th time that Mines has been in the top 20 teams. Our success in educating computer scientists to such a high standard is one of the reasons that the world finals will be held in Rapid City this spring,” said HW... “SD Mines is an exceptional engineering and science university, and we are proud of these students and their coaches” said SD Mines President Heather Wilson

Two other Mines teams placed in the top 15 regionally.

The North Central Region competition hosted 231 teams from Minnesota, Wisconsin, Western Ontario, Manitoba, Iowa, North Dakota, South Dakota, Nebraska, Kansas and Michigan.

Coaches included computer science faculty Larry Pyeatt, Ph.D., Paul Hinker, Ph.D., Rachel Krohn, Roger Schrader, Ed Corwin, Ph.D., and Toni Logar, Ph.D.

Red Team – 2nd Place
Matthew Schallenkamp, sophomore computer science and math major, Brookings; Matthew Dyke, senior computer science and math major, Hartford; Alexander Iverson, junior computer science major, Fort Collins, Colo.

White Team – 8th Place
Andrew Stelter, junior computer science major, Mankata, Minn.; Kenneth Petry, senior computer science and math major, Gilette, Wyo.; Aaron Alphonsus, junior computer science and math major, India

Blue Team – 14th Place
Micah Picasso, junior computer science major, Sioux Falls; Bryon Glass, senior computer science and math major, Rapid City; Christopher Navarro, junior computer science major, Sammamish, Wash.

Green Team – 26th Place
Naomi Green, sophomore computer science major, Corcoran, Minn.; Luke Videckis, freshman computer science and math major, Elmhurst, Ill.; Christina Taylor, junior mechanical engineering major, Rapid City

Cyan Team – 77th Place
Alex Crawford, sophomore computer science major, Chamberlain; Michael Pfeifer, sophomore computer science major, Owatonna, Minn.; Cheldon Coughlen, senior computer science major, Savage, Minn.

Magenta Team – 89th Place
Christian Sieh, senior computer science major, Hastings, Minn.; Lucas Carpenter, sophomore computer science major, Aberdeen; Zach Owen, junior computer science major, Rapid City
Ian Hoffman won the South Dakota School of Mines & Technology's third annual Competitive Entrepreneurial Opportunity (CEO) Student Business Plan Competition with his business Hoffman Enterprises, which will integrate robotics into a university-level curriculum.

A Stevens High School team won first in the high school division for “Not Your Grandfathers’ Coffee Company.”

Nearly 20 teams of students from South Dakota Mines, Black Hills State University and local high schools vied for $8,500 in prize money as they pitched the business and financial plans they have been working on since August. They were mentored by the university’s Entrepreneurs-in-Residence and local business leaders to prepare for the “Shark Tank” inspired competition. Students presented business plans to a panel of expert judges.

Since the launch of SD Mines CEO Competition two years ago, CEO competitors have won first place at the Governor’s Giant Vision Awards Competition in Sioux Falls both years.

“More and more of our students are interested in starting businesses. We really appreciate the community support we have received for this program,” said South Dakota Mines President Heather Wilson.

The sponsors for this event were:
- Big D
- West River Electric
- Governor’s Office of Economic Development
- Regional Health
- Sioux Steel Co
- Darren Haar
- Golden West Technologies

Intern Spotlight

Abigail Fuller | Frito Lay

Junior industrial engineering and engineering management major Abigail Fuller interned with Frito Lay (PepsiCo) in Utah. As an engineering and maintenance intern, she was tasked with reducing unintentional equipment downtime, a project worth approximately $200,000 in annual savings for the site!
This year's Chemical & Biological Engineering speaker series will feature scientists, medical doctors and entrepreneurs from national laboratories, elite research universities and hospitals.

The public is invited to all presentations, which will include topics such as energy conversion and generation, nanomaterials, health science, biomedical engineering, catalysis and reaction engineering and the Earth’s climate.

Speakers from MIT, CalTech, the University of California, Berkeley and others will discuss topics ranging from cardiology to atmospheric composition.

Jan. 24
Clayton Radke, Ph.D., University of California, Berkeley, catalysis, surface and colloidal science

Jan. 31
Bhasker Purushottam, M.D., Rapid City Regional Hospital, cardiology research, health/biomedical research

Feb. 14
Ian Marshall, Ph.D., Florida State University and National High Magnetic Field Laboratory, specialized FT-ICR MS for detection of hundreds of intermediates

March 7
Faye McNeill, Ph.D., Columbia University, Earth’s climate and atmospheric composition, aerosols

March 21
Alexander Neimark, Ph.D., Rutgers University, nanostructured materials, porous materials, molecular dynamic simulation

April 4
Linda Broadbelt, Ph.D., Northwestern University, catalysis, depolymerization and polymerization chemistry

April 11
Arup Chakraborty, Ph.D., Massachusetts Institute of Technology, adaptive immune response, infectious diseases, pathogens

April 25
David Tirrell, Ph.D., California Institute of Technology, macromolecular design, protein evolution, biological imaging, and proteome-wide analysis of cellular processes
SD Mines students performed at the annual Holiday at the Cathedral Concert featuring the Master Chorale, University Choir and Concert Choir at Our Lady of Perpetual Help Cathedral, while the Symphonic Band and Jazz Band offered their annual Holiday Band Concert in the Music Center.

The annual holiday Parade of Trees boasted the theme, “A Frosty Kind of Holiday,” featuring holiday trees decorated like snowmen by 25 to 30 organizations, each striving to outdo one another and produce the most festive tree of the season.

The annual Parade of Trees was sponsored by the Student Activities and Leadership Center, which collected canned food donations to benefit the campus student food pantry. “Frosty” gingerbread creations were designed and built by student groups and sponsored by the Women in Science and Engineering.

Gaming Marathon Raises $3,900 for Children’s Charity

The Gamers for Service team raised $3,900 with 130 participants from Mines and Who’s Game House during the annual 25-hour Extra Life 2016 gaming marathon for Children’s Miracle Network. The national event hosts 55,000 gamers who raised over $8 million.
The India Club of the South Dakota School of Mines & Technology and the public celebrated the 27th annual Diwali Night, featuring cultural foods, dances, henna hand-painting and a fireworks show. Diwali is the largest festival in India, celebrating peace and harmony beyond the Hindu religion. The India Club at SD Mines aims to increase awareness and understanding of the Indian culture through the event, which attracted nearly 500 people.
About Legacy News

Legacy News is produced by the Office of University Relations the first Wednesday of each month. The newsletter is a compilation of news releases, photos and Web articles.

To submit news or story ideas or to subscribe to the email distribution list, please contact Dani Mason, public relations officer, at 605.394.2554 or at Danielle.Mason@sdsmt.edu.

For more Mines news, visit news.sdsmt.edu