Grads Continue to Enjoy High Job Placements, Starting Salaries

New graduate placement figures for the School of Mines show that 98 percent of students who earn a bachelor’s degree secure a job in their field of study or pursue an advanced degree within the first year.

The 2013-2014 academic year graduates who directly entered the workforce received an average starting salary offer of $63,358, according to new figures released by the university.

Of last year’s SD Mines bachelor’s degree graduates, 211 had secured jobs in their field of study and 65 enrolled in graduate school.

The average starting salary offers for eight majors at South Dakota Mines are higher than the national average for those disciplines. Geology, the university’s top salary-earning major at $73,000, far exceeds the national average of $55,534.

A South Dakota Mines average starting salary for computer engineering is $69,286, also exceeding the national average of $68,053. Other average starting salaries for SD Mines degrees are $68,039 for mining engineering; $66,971 for chemical engineering; $66,250 for physics; $65,571 for computer science; $65,376 for geological engineering; $64,750 for metallurgical engineering; $64,556 for electrical engineering; $63,350 for mechanical engineering; and $62,568 for industrial engineering.

“Mines graduates are well-prepared leaders in engineering and science, and industry recognizes it. Our students are in high demand,” said Heather Wilson, president of SD Mines.

Thirty-six graduates live and work in the state for 26 different employers in 12 South Dakota communities. Among them:
- Aberdeen (3M, Molded Fiber Glass South Dakota)
- Mitchell (Innovative Systems)
- North Sioux City (Nutra-Flo)
- Philip (Scotchman Industries)
- Pierre (DOT, DENR)
- Rapid City (RPM, RESPEC, KLI, Ferber Engineering)
- Sioux Falls (Raven, POET, DocuTap)
- Vermillion (Masaba Mining Equipment)
- Yankton (Vishay, Gehl)

PayScale, a third-party validator of compensation figures throughout the country, last fall placed the early-career salaries (those within the first few years of a B.S. degree) of Mines graduates at $65,600. The PayScale rating is often used as a reference point by mainstream media, bringing national exposure to SD Mines in stories about the top returns on investment at U.S. colleges and universities.

Steel Bridge Team Takes Tenth at Nationals

The School of Mines Steel Bridge Team placed 10th overall at the 2015 national Student Steel Bridge competition in Kansas City, Mo. Over 200 teams competed this year with 47 qualifying for the national competition. The team qualified for nationals after placing first at the American Society of Civil Engineers (ASCE) Rocky Mountain Conference.

The team placed in the top 15 nationally in all of the competitive categories with their bridge “Jurassic Arch,” including top 10 finishes in efficiency and lightness. The bridge weighed 124 pounds and held 2,500 pounds of load with less than ½-inch of deflection. It was constructed by three students in less than 11 ½ minutes.

The top ten finishes solidified the team’s standing as one of the best in the country. The team is also one of only 12 that have done consistently well enough in the regional competition to qualify for nationals eight of the last nine years. The conference includes 14 schools from Wyoming, South Dakota, Colorado, Utah and New Mexico, and the bridge team must place in the top three overall to advance.

SD Mines also took first place in lightness, efficiency and economy at the ASCE Rocky Mountain Conference.
The Sanford Lab underground is teeming with microscopic life. And Rajesh Sani, Ph.D., has identified more than 9,000 microorganisms living in rocks, soil, water and even wood. His group has collected samples from levels all the way down to 5,000 feet, catalogued them and written papers about them for nine years. Now, Sani, an associate professor of biology at the South Dakota School of Mines & Technology, and a handful of students and post docs are putting that knowledge to work on projects that use extremophiles to create biofuels, polymers and even antibiotics.

Mohit Bibra and Aditi David, both Ph.D. students, and Saurabh Dhiman, Ph.D., a post doc, zeroed in on microbes that can help convert solid waste to biofuels. “If we can find something that is inexpensive, using substances that don’t compete with food sources, that will be really good,” Bibra said.

The process of converting solid waste usually takes several steps, including pretreatment, saccharification, fermentation and separation of the product, but in the laboratory at SD Mines, everything goes into one reactor with the extremophiles and plant matter. So far, the team is seeing positive results. Although the waste is reduced significantly, there are still “leftovers.” Sani and the team are hoping those leftovers will have a nitrogen source that can be used as fertilizer. “We are trying to develop zero-waste technology,” Sani said.

One of the main problems with municipal solid waste is the plastic. Ph.D. student Jia Wang (his advisors are David Salem, Ph.D., and Sani) is hoping to change that. Using a thermophile strain that thrives in high temperatures, Wang is working to develop polymers that can be used to create biodegradable plastic, starches, proteins and even latex. “This can provide many resources for industry,” Wang said.

Ashley Preston, a senior in applied biological sciences, set her sights on medicine. “There’s a major crisis going on with antibiotic resistance to drugs,” Preston said. “We’re hoping to find new antibiotics among these bacteria.” During a trip to the 4,850 Level, Preston collected biofilms and old rotted wood found at 17 Ledge. “It’s really humid. Perfect for good bacteria to grow.” Preston is successfully growing bacteria in the lab. The next step, she said, is to grow them against pathogens to see if they have any antibiotic properties. “We’ll know it’s working if there’s some inhibition of growth.”

Sani praised the work his students and Dhiman have done so far. “They have been working very hard and, I hope, learning something. I’m very proud of them.”
Eight South Dakota School of Mines & Technology track and field scholar-athletes have been named to the All-Rocky Mountain Athletic Conference Academic Honor Roll for the 2015 outdoor season. Senior Tyler Nack, junior Nick Alberts, sophomore Riley Hosman, junior Davis Mathieu, senior Haley Dunn, sophomore Therese Frels, sophomore Tasha Timm and sophomore Jessica Tisdale all received the conference honor. To qualify, scholar-athletes must have a Grade Point Average (GPA) of 3.30 or better, be a starter or reserve and have completed two consecutive semesters or three quarters at their current institution.

“There are no easy degrees at Mines. We are very proud of our exceptional scholar-athletes who are leaders on the track and in the classroom,” said President Heather Wilson.

Nordeen Earns All-Region Pole Vault Honor

School of Mines sophomore Mikenzie Nordeen received South Central All-Region honors from the U.S. Track & Field and Cross Country Coaches Association (USTFCCCA) for the 2015 NCAA Div. II Outdoor Track & Field season.

The top five individuals in each event from each region earned the All-Region distinction, in addition to members of the regions’ top three relay teams.

The regions used for this award match those used during the cross country season, and student-athletes must come from USTFCCCA member institutions.

“We are very excited for Mikenzie,” said Hardrocker track and field coach Jerry Schafer. “She has worked very hard to develop her pole vault technique this season. We are looking for vast improvements next year based on what she was able to accomplish this season.”

Nordeen had an impressive season for the Hardrockers, breaking the SD Mines school record in the event three times this year. The chemical engineering major from Alliance, Neb., holds the current record after clearing a height of 11-feet-1.7-inches, which netted her the USTFCCA award. Nordeen also holds the indoor pole vault school record (10-6), set this year.

The U.S. Track & Field and Cross Country Coaches Association is a nonprofit professional organization representing cross country and track & field coaches of all levels. The organization represents over 8,000 coaching members encompassing 94 percent of all NCAA track & field programs (DI, DII, and DIII) and includes members representing the NAIA as well as a number of state high school coaches associations.

The USTFCCCA serves as an advocate for cross country and track & field coaches, providing a leadership structure to assist the needs of a diverse membership, serving as a lobbyist for coaches’ interests and working as a liaison between the various stakeholders in the sports of cross country and track & field.

Nordeen Earns All-Region Pole Vault Honor

From top left: Tyler Nack, Nick Alberts, Riley Hosman, Davis Mathieu. From bottom left: Haley Dunn, Therese Frels, Tasha Timm, Jessica Tisdale.

Eight Track & Field Scholar-Athletes Named to RMAC Honor Roll

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Nack (4.0) is a distance runner majoring in electrical engineering from Brandon, S.D. Mathieu (3.45) is a distance runner majoring in applied biology from Spokane, Wash. Frels (3.88) is a distance runner majoring in physics from Guthrie Center, Iowa. Timm (3.85) is a thrower majoring in mechanical engineering from Grover, Colo. Dunn is a thrower (3.54) from Meridian, Idaho. Tisdale (4.0) is a high jumper majoring in civil engineering from New Underwood, S.D.

“We are very proud of the accomplishments of these eight scholar-athletes,” said Hardrocker track and field coach Jerry Schafer. “They have all been an integral part of our program both academically and athletically. Nack, Alberts and Dunn also hold school records in their respective events. The balance that all of these student-athletes has to keep between studies and training makes their accomplishment that much greater.”

The scholar-athlete’s cumulative GPA is based on what they had earned after the fall semester. First Team selections were voted on by all RMAC sports information directors at schools which sponsor the sport of men’s and women’s indoor track and field.
Partnering with the U.S. Forest Service, graduate paleontology student Reid Cummins will embark on fieldwork for his master's thesis at a fossil-rich site only accessible by special permit. The opportunity has been two years in the making, beginning when Cummins’ academic advisor Sally Shelton, Museum of Geology collections manager and instructor in geology and geological engineering, approached the forest service’s north zone paleontologist Barb Beasley, with an idea as unique as her student.

“My disability is from a condition known as dwarfism, which hindered my growth so that I only stand at a height of three feet, one inch,” said Cummins, a Lancaster, Pa., native who holds a geology and biology bachelor’s degree from San Diego State University. “The main issue for my role in the paleontology world is that I have very limited mobility. I had to find a thesis project that I can actually physically complete as a little person, which also meets the School of Mines’ program requirements.

Cummins will conduct research at the Wallace Ranch Paleontological Special Interest area in the Nebraska National Forests & Grasslands (NNFG) near Ardmore, S.D.

“The Wallace Ranch is not overly large, rugged or steep, rather a gentle sloping terrain. Cummins will be able to park right next to the site,” Beasley said. She is also planning a Passport in Time (PIT) project where volunteers will collect specimens alongside Cummins for his research.

PIT is a volunteer archaeology and historic preservation program through the U.S. Forest Service that allows participants to work with professional archaeologists, paleontologists and historians on national forest lands throughout the country.

Cummins will count and identify specimens, including marine fossils, mosasaurs, fish and sharks, in conjunction with layers of decomposed volcanic ash, to try to determine if the volcanic ash that fell throughout the Western Interior Sea affected the marine fauna. The area has experienced six volcanic ash-fall events during the time of the deposition of the Pierre Shale at the site.

Cummins is well-prepared for the work, completing a museum certificate program at Black Hills State University while pursuing his master’s of paleontology at the only university in the country offering the degree.

“Reid is very inspirational. His hard work and dedication exemplify his charisma. Reid’s connection to our public lands illustrates the diversity of resources National Forests and Grasslands offers. Our partnership with Reid will be lifelong, rooted in the scientific findings of his research and the memories from the fieldwork shared with everyone who participates,” said NNFG Acting Forest Supervisor Jim Pitts.

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**Senior Zachary Kroehler Places Fourth in ASME Competition**

Senior mechanical engineering major Zachary Kroehler from Henderson, Minn., placed fourth in the American Society of Mechanical Engineers (ASME) Old Guard Oral Competition held in Milwaukee, Wis., for his presentation on “The Future of Cold Spray,” developed in conjunction with his team’s senior design project and the Arbegast Materials & Processing Center.

Mines students also competed in the ASME Student Design Competition, developing a remote-controlled vehicle to navigate an obstacle course designed to simulate material transportation in an emergency situation. The course challenged participants to navigate a 7-cm deep section of water and a section of sand as well as climb 20-cm obstacles to deliver a granular device.

**Museum of Geology to Offer Military Discount on Gift Shop Purchases**

The Museum of Geology is participating in the Blue Star Museums program this summer. The museum will offer a 10 percent discount off of any gift shop purchase with a military ID through Sept. 1.

Blue Star Museums is a collaboration among the National Endowment for the Arts, Blue Star Families, the Department of Defense and more than 2,000 museums nationwide.

The program is available to any bearer of a Geneva Convention common access card, a DD Form 1173 card (dependent ID) or a DD Form 1173-1 ID card, which includes active duty military: Army, Navy, Air Force, Marines and Coast Guard, as well as members of the National Guard and Reserve, U.S. Public Health Service, Commissioned Corps, NOAA Commissioned Corps and up to five family members.
Students Win Butterfield Cup for Mobile App, Entrepreneurship

A five-student team from the South Dakota School of Mines & Technology has won the 2015 Butterfield Cup, awarded by local entrepreneurs to the best mobile app business plan, product and investor pitch. The cup comes with a trophy, a prized seat at a start-up boot camp and dinner with university President Heather Wilson and local venture capitalists.

Senior computer science major and Rosemount, Minn., native Charles Bonn says the team's winning app "Crowdcontrol" was designed to ease the experience of friends going out in groups, offering users group messaging and GPS location of their party.

“The Butterfield Cup is a great way for local entrepreneurs to engage with the next generation of entrepreneurs and innovators preparing for leadership at the School of Mines,” said Heather Wilson, SD Mines President. "I look forward to having this app on my phone!"

Other team members, all computer science majors, are junior Johnathan Ackerman and seniors Joseph Mowry and Evan Hammer from Rapid City and senior Daniel Andrus from Spearfish.

The culmination of a semester's worth of work, the second-annual competition pitted seven Mines teams led by student CEOs against each other to develop the best product. Local entrepreneurs Brian Butterfield and Pat Honeycutt from Pixel Pines, Mines entrepreneur-in-residence Darren Haar, Ed Mandy from 7400 Circuits, Mines alumnus and serial entrepreneur Mike Boucher and Jeff Wehrung, Black Hills State University business professor, guided the teams towards a finished app, helping to finesse their business plans and pitches.

Other Butterfield Cup contestant apps monitor landscape changes for the U.S. Geological Survey and restaurant wait times and help new residents learn of community events. Students also developed a hiking app, a journaling app that keeps track of what users read and an integrated home system that works with voice commands.

Mathematics and Computer Science Professor Antonette Logar says the point of the Butterfield Cup is to build entrepreneurs in computer science, and the competition already boasts a track record of success. Last year's winners have formed a company and are currently working with angel investors to push their product to market, and she hopes this year's winners will do the same.

That type of ambitious innovation, Logar adds, is the key to keeping the U.S. competitive.

“Consider this: 4.75 million jobs in science, engineering, math and technology (STEM). Of those 2.2 million are in math and computer science, which is particularly startling because computer science is only about 40 years old as a discipline. The U.S. Department of Labor projects that 80 percent of all new jobs in STEM will be in computer science. Computer science is the biggest STEM field out there, it has enormous economic impact—every business is now a software business – and if we want to stay competitive as a nation, we'd better be leading the field in computer science research and innovation.”

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