One Hundred Eighty-Fourth Commencement

Saturday, December Eighteenth
Two Thousand and Twenty-One
The Monument Theatre

ORDER OF CEREMONY

Master of Ceremonies	Dr. Lance Roberts
Processional *(Stand)*	South Dakota Mines String Theory
Pomp and Circumstance by Elgar	
Presentation of Colors	Army ROTC Color Guard
President's Message	Dr. Jim Rankin
Presentation of the Distinguished Alumni Awards	Dr. Lance Roberts
Senior Class Representative's Message	Ms. Shelby Guthrie
Message from the Board of Regents	Ceremonial Representative
Presentation of Honorary Degree	Dr. Jim Rankin
Conferral of Degrees	Dr. Jim Rankin
Presentation of Degree Candidates	Dr. Joseph Dlugos
Alumni Welcome	Dr. Jerry Wright
Retirement of Colors	Army ROTC Color Guard
Recessional *(Stand)*	South Dakota Mines String Theory
La Rejouissance by Handel	

SOUTH DAKOTA MINES STRING THEORY

Tammy Schnittgrund, Director
Brandon Gabert
Thomas Mayfield
Kory Engelstad
Thatcher Dramstad
Abby Sharp
Bennet Outland
Tristen Olsen
Nick Adams
Ethan Rogers

This program is not an official document. Due to strict requirements, it must be printed before the final list of degree candidates can be determined.

DISTINGUISHED ALUMNI AWARD
2020 RECIPIENT

David Hammond

David Hammond received a bachelor's degree in geological engineering from South Dakota Mines in 1969 and is an internationally-known mineral economist. He has worked in that specialty, and as a geologist and engineer, for more than 50 years in all sectors of the natural resource industries. He has held positions in exploration, engineering, financial analysis, marketing, strategic planning, and corporate development. Employers have included Anaconda Minerals, ARCO Coal, Shell Oil and General Electric's Ladd Petroleum affiliate. In the early 1990s, he began a mineral economics consulting practice, focusing on mineral asset valuation and appraisal, risk analysis, and commodity market research. In 1997, David brought his consulting practice into the Global Energy & Mining Group of Pricewaterhouse-Coopers, returning to independent practice in 2000. In 2004, he joined International Royalty Corporation, serving as CFO during its highly successful Canadian IPO and later as vice president of strategic planning, until the firm's acquisition by Royal Gold in 2010.

For more than 20 years, Hammond has served on the Accreditation Board for Engineering and Technology, first as an evaluator of geological engineering programs, and from 2012 to 2017 as commissioner on the Engineering Accreditation Commission. In 2018, the Society of Mining Engineers asked him to take on a similar role with the Applied Natural Science Accreditation Commission. He has overseen the accreditation of numerous engineering and science programs at universities throughout the world, most often as the ABET team chair in charge of the reviews.

Hammond is a long-serving member of the Mines Geology & Geological Engineering Advisory Board. He was instrumental in establishing the JPMorgan Center for Commodities at the University of Colorado-Denver Business School, serving on the advisory and research councils, and teaching the key Foundations of Commodities graduate course. He has also been a full-time lecturer in finance for the Daniels Business School at the University of Denver. Since 2009, he has been adjunct professor at the University of Arizona, teaching courses in mineral valuation and resource economics via the Lowell Institute for Mineral Resources. He has authored nearly 40 industry papers and conference presentations, and conducted numerous workshops and seminars on mineral valuation, due diligence, and commodity market issues worldwide. In 2016, he received the Mineral Economics Award from the American Institute of Mining, Metallurgical, and Petroleum Engineers.

Hammond holds a master's degree from the University of Utah, an MBA in energy finance from the University of Denver, and a PhD in mineral economics from the Colorado School of Mines. He served as an engineer officer with the US Army from 1971 to 1973, assigned to heavy construction and quarry units in the United States and in Vietnam, where he was a Bronze Star recipient. He currently resides in Highlands Ranch, CO, with his wife Diane (Gleason) (Math '69), a retired telecommunications industry executive.

DISTINGUISHED ALUMNI AWARD
2020 RECIPIENT

John Henderson

John Henderson graduated from South Dakota Mines with a bachelor's degree in civil engineering in May 1994. He was commissioned in the US Army Corps of Engineers upon graduation and retired in the grade of colonel in 2017 after a 23-year career. During his time in the Army, he held multiple command and staff positions and completed three combat tours (two to Iraq and one to Afghanistan). Henderson continued his education while in the Army, earning a master's degree in civil engineering from Mines and serving as a National Security Studies fellow with the Massachusetts Institute of Technology. He culminated his Army career as the commander for the Omaha District, US Army Corps of Engineers.

After his retirement, Henderson was nominated by President Trump and confirmed by the full Senate to serve as the assistant secretary of the Air Force for Installations, Environment and Energy. During his time at the Pentagon, he was responsible for the formulation, review, oversight, and execution of plans, policies, and programs for a $12 billion annual budget supporting 173 Air Force installations worldwide. His portfolio included all energy activities, life-cycle infrastructure investment for 98,000 facilities worth over $280 billion, new construction, environmental planning and compliance, water resources management, tribal relations, safety policies, and occupational health objectives during the COVID-19 pandemic. A few of his team's key policy achievements for the Department of the Air Force include a global infrastructure investment strategy, remediation programs for emerging contaminants, improvements to privatized housing, and master planning for the post-disaster reconstruction at Tyndall AFB, FL, and Offutt AFB, NE.

In January 2021, Henderson joined HDR, Inc. in Omaha as the chief administrative officer, where he provides executive leadership for several global corporate programs to enhance the delivery of engineering, architecture, and professional consulting services to clients worldwide.

Henderson was recognized as the Federal Engineer of the Year in 2017 by the National Society of Professional Engineers and has earned a number of military awards, including the Legion of Merit, three Bronze Star medals, the Combat Action Badge, and the Silver deFluery medal. He continues to be active in the Society of American Military Engineers Academy of Fellows and was recently named to the Mines CARA Board Executive Committee.

DISTINGUISHED ALUMNI AWARD
2020 RECIPIENT

Todd Kenner

Todd Kenner graduated from South Dakota Mines with a bachelor's degree in civil engineering in 1983. He has more than 38 years of experience in engineering design and business management. Beginning his career as a water resource design engineer for public projects in Fort Collins, CO, to leading a $600M A/E/C consulting company, Kenner has been instrumental in growing companies, developing talent, and setting strategic direction for organization sustainability.

Currently, he is the president/CEO of RESPEC, a 52-year-old company headquartered in Rapid City whose founders were academic professors at Mines. During his 12 years at RESPEC, he has led the strategic expansion leveraging the company's nationally-recognized technical expertise in the area of rock mechanics. During his tenure, RESPEC has grown from annual revenues of $14 million to $85 million and geographic presence of two offices to 26 offices and one international location. RESPEC is an employee-owned company with 500 professionals.

Kenner's professional experience has encompassed all aspects of civil engineering, land surveying, and administrative/financial management. His technical background focus is hydraulics/hydrology. During his career, he has become adept in managing and directing large, multidimensional infrastructure projects requiring coordination with diverse technical stakeholders and community interests. His technical project understanding is complemented by critical knowledge of social, economic, and financial factors that drive the ultimate "community" solution for complex projects.

Throughout his career, Kenner has been committed to public service and strong community involvement. He has served in various leadership roles for a wide range of professional organizations, public advisory boards, and community foundations. His public service experience has included board leadership with the American Council of Engineering Companies (ACEC) in Nevada, Florida, and South Dakota. He spent 10 years on the Nevada State Board of Professional Engineers and Land Surveyors, serving as vice chair and chairman. He served 12 years on the Center for Alumni Relations and Advancement (CARA) Board's Executive Committee and as chair for four years. Currently, he serves on the Elevate Rapid City Board of Directors and Executive Committee and on the board of directors for the Community Health Center of the Black Hills.

DISTINGUISHED ALUMNI AWARD
2020 RECIPIENT

Kurt Kost

Kurt Kost graduated from South Dakota Mines with a bachelor's degree in mining engineering in 1978. He has more than 35 years of experience in the mining industry. He began his career with Kennecott Copper and then worked for AMAX Coal and its predecessor companies for 32 years. His areas of responsibility ranged from surface mine field engineering to numerous operational and executive management positions, eventually becoming president of Alpha Natural Resources.

Kost's career was highlighted with accomplishments related to change management, teamwork and operational efficiency. He was very fortunate to have been surrounded by great people and wonderful mentors throughout this career. One of his top achievements was helping lead two corporate mergers for three major coal companies and installing a new safety and operating culture of excellence across over one hundred mines and fourteen thousand employees. He and his teams pioneered the operation of large truck-shovel equipment in North America with the implementation of 80-120 ton capacity shovels and 240-360 ton capacity trucks. This equipment combination has become today's standard for large surface mines throughout the world. His operating teams were also industry leaders in the adaptation of wireless communications for managing payloads and machine health on a real-time basis.

He served on the Mines Mining Engineering Industrial Advisory Board in the early 2000s, during a time when the department was nearly shut down. He, along with other alumni, were strong advocates for saving the department. They were successful in raising funds, retooling the curriculum, and rebuilding the department.

Since retiring from the mining industry in 2012, he has been an independent director for Westmoreland Resource Partners. He serves as a trustee for the SME Foundation, director for a nonprofit ministry in Utah, and trustee for an employee retiree health plan.

Kost and his wife, Norma, have been married 43 years. They have three daughters and five grandchildren. They reside in Bountiful, UT.

DISTINGUISHED ALUMNI AWARD
2020 RECIPIENT

Renita Mollman

Renita Mollman graduated from South Dakota Mines with a bachelor's degree in civil engineering in 1988. She is chief administrative officer (CAO) and a senior vice president at Burns & McDonnell, a family of companies bringing together 7,600 engineers, construction professionals, architects, planners, technologists and scientists to design and build critical infrastructure. Founded in 1898, Burns & McDonnell is employee-owned and has more than 60 offices globally.

Mollman joined Burns & McDonnell in 1988, beginning her career as a civil engineer. Over the course of the next two decades, she supported more than 100 projects for multiple aviation and military clients while serving as the first female engineering manager in the firm. Working in a male-dominated industry, Mollman committed to working with other women to help them grow and chart new paths. She remains passionate about advancing and mentoring other women in the firm and growing the firm's female leadership team.

In 2009, Mollman was promoted to general manager for the California region and was soon named vice president, one of the first female officers at the firm. Under her leadership, this regional team grew from just a few employees to more than 250; the firm was named a best place to work in Southern California seven times; and regional revenue nearly quadrupled.

Mollman became CAO in 2020. She now oversees corporate services including human resources, marketing, communications, security, travel, fleet, facilities, and diversity, equity, and inclusion (DEI). She became the firm's first female board member in 2021.

She has always had a strong commitment to DEI. She led efforts to develop a new position: the firm's first DEI strategy manager, who will work to provide strategic guidance for enhancing DEI initiatives and programs in the firm.

She leads the COVID Response Team at Burns & McDonnell and is also chair of the Kansas City Vaccine Task Force, working to make it easier and equitable for all Kansas Citians to have access to a COVID-19 vaccine.

Her community involvement revolves around improving equity and access for women in STEM. Whether it's speaking at events, visiting schools to help spark an early interest in STEM, mentoring others or volunteering time with youth organizations, Mollman wants to be there as a teacher, leader, and friend.

DISTINGUISHED ALUMNI AWARD
2021 RECIPIENT

William Betten

William Betten graduated from South Dakota Mines in 1977 with bachelor's degrees in physics and electrical engineering. He has over 40 years of product development experience in fields ranging from aerospace and defense to commercial/industrial to medical devices. He earned a master's degree in electrical engineering from the University of Minnesota, a certificate in advanced management from Babson College (Wellesley, MA), and certification as a project management professional.

He initially worked for Honeywell in Minneapolis in various roles, including leading the design and commercialization of one of the first practical through the lens autofocus systems (TCL) for SLR and video cameras and his role as program manager of the DARPA Gallium Arsenide (GaAs) Pilot Line design activities, resulting in significant advances in that emergent technology.

In 1987, he joined 3M in St. Paul, MN. His work there included development of one of the world's first digital programming hearing aids, heart/lung perfusion systems, advanced data recording systems, and materials processing experiments flown in the space shuttle. He was also involved in early teleradiology developments transmitting images from the USS George Washington to Bethesda Naval and Walter Reed Army hospitals and supporting deployed medical units. In 1993, the digital image recorder product team he led received Radiology Today's "Top 10 Most Innovative Products in Radiology" award.

After 20 years in large corporations, Betten transitioned to leadership positions at smaller corporations, including Datacard, Plasmon, Teradyne, Nonin Medical, Logic PD, and Nortech Systems. In 2017, he formed his own product consulting firm, Betten Systems Solutions. He also serves as director of solutions for S3 Connected Health based in Dublin, Ireland, and is senior vice president of product development and engineering for ClearIt, LLC, a medical device startup. He has published more than 50 papers and articles and is a frequent speaker at medical and product development conferences.

Betten, his wife Sue, and son Chris reside in Woodbury, MN. He has served on civic boards including planning commission, city council, and economic development. He also contributes to higher education, serving on engineering advisory boards for Minnesota State University and at the University of St. Thomas, where he helped start the electrical engineering department, and on several boards at the University of Minnesota. He serves as a member of the Mines University Advisory Board, as an Entrepreneur-in-Residence (EIR), on two department advisory boards, and is engaged in economic development activities. He is a life member of IEEE and Triangle Fraternity.

DISTINGUISHED ALUMNI AWARD
2021 RECIPIENT

George “Rusty” Gray

George “Rusty” Gray graduated from South Dakota Mines with a bachelor’s degree in 1976 and a master’s degree in 1977, both in metallurgical engineering. In 1981, he received a PhD in metallurgical engineering from Carnegie-Mellon University. In 1982, he began a post-doctoral fellowship at the Technische Universitaet Hamburg-Harburg in Germany where he studied the influence of microstructure on the fatigue behavior of several titanium alloys.

He joined Los Alamos National Laboratory (LANL) in 1985. Over the past 37 years, he has conducted independent research on the structure/property relationships during the deformation of materials, in particular in response to high-strain-rate and shock deformation. He has developed and promoted the use of "soft" shock recovery techniques for systematically studying the influence of shock-wave loading parameters on post-shock material response. He has promoted dynamic structure/property research on materials and worked to further the development of dynamic materials and condensed matter research within the materials and physics communities, DOE, the DoD, and industry. He is currently a lab fellow and scientist 6 at LANL.

He is a life member of Clare Hall, University of Cambridge (UK) where he was on sabbatical in 1998. He co-chaired the Physical Metallurgy Gordon Conference in 2000. He is a fellow of the American Physical Society (APS), a fellow of ASM International, and a fellow of the Minerals, Metals, and Materials Society (TMS). He is a member of APS, ASM, TMS, and serves on the advisory board of the European DYMAT Association. In 2010, he served as the president of the Minerals, Metals, and Materials Society. In 2012, he became the chair of the Acta Materialia Board of Governors, which oversees the publication of the journals Acta Materialia, Scripta Materialia, Acta Biomaterialia, and Materialia. He has authored or co-authored more than 480 publications. In 2017, he was elected to the National Academy of Engineering (NAE). In 2018, he was awarded the Rinehart Award from the European DYMAT Association. In 2019, the American Physical Society awarded him the 2019 George E. Duvall Shock Compression Science Award. In January 2020, he was awarded the American Ceramic Society ICACC Plenary Lecture. Since August 2020, he has served on the congressionally-mandated National Academy Study Panel Assessing the Feasibility of the Strategic Long-Range Canon (SLRC) for the US Army.

DISTINGUISHED ALUMNI AWARD
2021 RECIPIENT

Timothy Klaus

Timothy Klaus graduated from South Dakota Mines in 1987 with a bachelor's degree in chemical engineering. He began his career as a process engineer for Dow Corning in Midland, MI. After four years, he was awarded a full tuition scholarship and enrolled in the University of Notre Dame's MBA program. While at Notre Dame, he completed internships with two companies in Japan.

Upon graduation with honors from Notre Dame, Klaus joined the Ford Motor Company working in corporate finance. His first year was at the Kentucky Truck Plant in Louisville. While in Louisville, the governor of Kentucky awarded him a commission to the Honorable Order of Kentucky Colonels, a voluntary philanthropic organization. A commission in the Kentucky Colonels is the highest title of honor bestowed by the governor of Kentucky.

Klaus worked nine years for Ford in five different positions. In 2002, he joined TRW Automotive as the Asia Pacific finance director for three years, first based in Kuala Lumpur, Malaysia, and then Shanghai, China. He was then appointed the finance director for the Engineered Fasteners and Components business unit based in Germany.

He returned to the US and joined Whirlpool in 2006 to be the senior director of finance for North America Manufacturing Operations. He provided financial leadership to Whirlpool's manufacturing footprint rationalization after purchase of Maytag.

In 2009, Klaus joined Dana Automotive as the regional vice president of finance Asia Pacific based in Shanghai. In this role, he led the financial due diligence for a $800 million commercial vehicle axle JV with a Chinese OEM. In 2014, he become the managing director for Thailand. In this role, Dana's Thailand plants won the Dana Diamond award four times in five years – an award presented by the CEO to the best plant globally out of more than 150 plants. Klaus also led the launch of a $40 million dollar state-of-the-art gear manufacturing facility in Thailand.

In 2019, Klaus was appointed the senior managing director of Light Vehicle Driveline Asia-Pacific with business responsibility for operations in China, India, Japan, Taiwan, and Thailand. Klaus leads Asia operations with more than $700 million in annual revenue.

DISTINGUISHED ALUMNI AWARD
2021 RECIPIENT

Steve Vanderboom

Steve Vanderboom graduated from South Dakota Mines in 1974 with a bachelor's degree in civil engineering. In 1976, he received a master's degree in environmental engineering from the University of Minnesota.

He founded Pace Analytical Services in 1978 and has grown the business steadily over the years. It is currently the largest environmental testing business in the United States and the largest privately held testing company performing environmental, pharmaceutical and medical device testing in the US.

He served as CEO for 41 years, then became executive chairman, and recently reduced to a part-time role as founder and chairman emeritus. The company has more than 60 laboratories around the United States and in Puerto Rico, and has grown from two employees to more than 3,400 today. Majority ownership was transitioned in 2016 to private equity company, Aurora Capital. Vanderboom continued his leadership role and a strong equity interest after the ownership transition.

He was recognized with the Lifetime Achievement Award from the Environmental Business Journal, the only such award granted to a leader in the laboratory business. He serves on the boards of Pace, the American Council of Independent Laboratories, and the Global Water Center; and is active in his church, community and several charitable organizations.

DISTINGUISHED ALUMNI AWARD
2021 RECIPIENT

Lisa Zacher

Lisa Zacher graduated from South Dakota Mines in 1985 with a bachelor's degree in chemistry. During her time at Mines, she participated in basketball, volleyball, and track. She was named to the Athletic Hall of Fame in 2008 and appointed to the Center for Alumni Relations and Advancement (CARA) Board of Directors in 2020. She received her medical degree in 1989 from the University of South Dakota, and then completed her internal medicine residency at William Beaumont Army Medical Center in El Paso, TX, and pulmonary/critical care training at Madigan Army Medical Center in Tacoma, WA, and at the University of Washington.

Zacher is a retired US Army Colonel with 24 years of active duty service. While stationed at Tripler Army Medical Center in Honolulu, HI, she participated in two Joint POW/MIA Accounting Command (JPAC) missions to Laos, searching for service members' remains from the Vietnam War. She completed two combat deployments in support of Operation Iraqi Freedom. During her first tour (2008-2009) she served as an intensive care physician in the Green Zone. In 2011, she deployed as the deputy command surgeon for United States Forces – Iraq (Camp Victory), where she was the chief of staff equivalent for the entire Iraqi theatre. Her final assignment was as chief of medicine at Brooke Army Medical Center at Ft. Sam Houston in San Antonio, TX, a 450-bed Level 1 trauma facility, from 2005 to 2013. Her clinical expertise in pulmonary/critical care medicine was recognized by her receipt of the "A" Designator (the equivalent of tenured professor). She also was appointed as pulmonary consultant to the Army Surgeon General from 2008 to 2013 and served as a DoD spokesperson for burn pits, with several publications and presentations related to lung injury and airborne hazards. Her military awards included the Legion of Merit, Bronze Star, Defense Meritorious Service medal and two Meritorious Service medals.

She is active in many professional organizations. She served as the American College of Physicians (ACP) Army Chapter Governor from 2009-2013 and attained Mastership in the ACP. In 2020, the Army ACP Chapter initiated a new annual award: the Colonel Lisa L. Zacher Mentorship of Women in Medicine. She currently is the chief of staff for the Orlando VA Health Care System, where she oversees the care of more than 130,000 central Florida veterans, while serving as the core medical administrator of 12 sites of patient care; 5,500 employees; and $1.5 billion budget, covering the most clinical encounters in the entire VA system. She maintains extensive academic affiliations, including appointments as associate professor of medicine and associate dean for veterans affairs at the University of Central Florida in Orlando.

SENIOR CLASS REPRESENTATIVE

Shelby Guthrie

Shelby Guthrie came to South Dakota Mines after graduating from T.F. Riggs High School in Pierre, SD. Her parents are Clark and Lynne Guthrie, and she has an older sister, Karissa.

Guthrie has been involved in various clubs and activities while at South Dakota Mines. She served on the Student Association Senate as the governmental relations committee chair and president in the 2020-21 academic year; as the tri-chair of the Rocker Days Committee; and as treasurer of the Alpha Omega Epsilon professional sorority. She is a member of the Tau Beta Pi and Order of Omega honor societies. She has worked as an undergraduate research assistant at South Dakota Mines, and has completed two internships, one in surface water quality engineering and one in environmental engineering. She will serve as a legislative intern for the 2022 session.

After graduating with her Bachelor of Science degree in chemical engineering, Guthrie plans to attend graduate school for renewable energy at the University of Massachusetts Lowell in Lowell, MA.

HONORARY DOCTOR OF PUBLIC SERVICE

James Scull

James Scull graduated from South Dakota Mines in 1974 with a bachelor's degree in civil engineering. About a year later, he became a partner in a small local construction firm. He started Scull Construction seven years later.

Scull Construction has evolved into one of the largest construction companies in South Dakota, includes an office in Dickinson, ND, works in a five-state region, and employs more than 300 people. The success of Scull Construction led to the startup of many construction-related businesses and a score of commercial and residential development ventures and the company previously received the Rapid City Chamber of Commerce Granite Award.

Scull was named the South Dakota Philanthropist of the Year and the Rapid City Chamber of Commerce George Award winner. He has served as vice chairman and one of the founders of Rapid City Collective Impact - One Heart Campus, founder and president of South Dakota Youth Hunting Adventures, past president of the South Dakota Associated General Contractors, and an ongoing contributor to the Nature Conservancy, the Rocky Mountain Elk Foundation, Pheasants Forever, the Safari Club International, the Mule Deer Foundation, and Black Hills Sportsmen. He was inducted into the South Dakota Hall of Fame in 2019.

James and his wife, Mary, have two children and six grandchildren.

GRADUATE DESIGNATIONS

† 2020 Graduate
‡ Summer 2021 Graduate
†† Summer 2020 Graduate
¥ Honors Program Graduate

BACHELOR OF SCIENCE DEGREE

*Cum Laude	White Tassels	3.50 - 3.69 GPA
**Magna Cum Laude	Red Tassels	3.70 - 3.89 GPA
***Summa Cum Laude	Gold Tassels	3.90 - 4.00 GPA

ASSOCIATE OF ARTS DEGREE

•Honors	3.50 – 3.69 GPA
••High Honors	3.70 – 3.89 GPA
•••Highest Honors	3.90 – 4.00 GPA

DOCTOR OF PHILOSOPHY DEGREE CANDIDATES

Biomedical Engineering

Jevin Gerald Meyerink ‡
Titanium Dioxide Nanotubes: Application in Establishing Cellular Response Mechanisms for Osteogenesis

Chemical and Biological Engineering

Eswar ArunKumar Kalaga
Application of Machine Learning and Deep Learning Models for Forecasting the Time-Series Data, Predicting the Glass Transition Temperature (Tg) and Synthesis of Biodegradable Polymers

Civil and Environmental Engineering

John Joseph Costello
Evaluating Characteristics and Methodologies of Remotely Classified River Systems in the United States and Mongolia

MD Sazadul Hasan ‡
Transport and Retention of Nanomaterial in Porous Media: Experimental and Modeling Investigation

Mohammad Jamil Islam
Surface Modifications Approaches of Electrodes for Bioelectrochemical Oxidation of Methanol: A Microbial Fuel Cell Application

Ali Shojaei Zadeh ‡‡
Development of Integrated Decision Support Tools for Stormwater Management

Bhuvan Naga Chowdary Vemuri ‡
Bio-Electrochemical Module for Energy Efficient Wastewater Treatment and Reuse

Geology, Geological Engineering, and Mining Engineering

Ray Wayne Sheldon
Quantitative Analysis of Mineral Industry Reputations, State Policy, and Economic Impact

Materials Engineering and Science

Brian Lee James
Microstructure, Mechanical, and Corrosion Properties of Aluminum Cold Spray Coatings Prepared with the Use of Zirconia Beads as Secondary Peening Agent

Bernardo Moreno Baqueiro Sansao ‡
Selective Separation of Particles through Investigation of Adhesive Forces between Solids

Leila Sorkhi ‡
Study of the Microstructure, Mechanical Properties, and Corrosion Behavior of WE43 Magnesium Alloy Deposited Using Laser Powder Directed Energy Deposition

Forest Cater Thompson ‡
Sputter Deposition, Phase Modulation, and Characterization of Vanadium Nitride-Based Coatings for Controlled Diffusion

Mechanical Engineering

Anurag Chakraborty
Evaluation of the Intrinsic and Interfacial Shearstress Relationship in Thin Film Coatings

MASTER OF SCIENCE DEGREE CANDIDATES

Biomedical Engineering

Thomas Andrew De Long

Chemical Engineering

Samuel P. Crawford
Khang Trong Huynh

Civil and Environmental Engineering

Justin Cole Broekemeier
Bryant Mark Gernes
Christian James Heinrich
Zane Lee Hiller
Matthew Zachary Kirkwold
Luke Michael Koski
Brandon Miles Kruse
Nathan Jacob Martian
Casey William Martin
Sorel Lauren Nelson
Jonah Andrew Schmagel
William Frederick Schultze ‡
Morgan Melissa Wetz

Computer Science and Engineering

Christina Marie Bergevin ‡

Construction Engineering and Management

Nathan Scott Klette
Hunter Casey Martin
Westley Erik Siebdrath
Jay Matthew Van Hove

Electrical Engineering

Weston Kyle Crockett
Alex Paul Greenfield
Sagar Hossain
David Steven Janssen
Kolton Kugler

Engineering Management

Ace James Amiotte
Elle Amelia Carlson
Daniel Barrett Digatono ‡
Robert Leroy Roberts

Geology and Geological Engineering

Michael Paul Baranowski

Materials Engineering and Science

Caleb Michael Dillinger ‡
Kelsey James Fitzgerald
Marcie MaryAnna Hinker ‡
Jackson William King ‡
Sierra Rae Rasmussen

Mechanical Engineering

Carter John Barkley ‡
Daniel Joseph Boe ‡
Benjamin Paul Colvin
Terrence Scott Kuca ‡
Andrew J. Molder
Zachery Levi Style
Tristan Nicolas Von Nieda ‡

Mining Engineering and Management

Jaimie Michael Addy
Kelly Rae Norton
Ardan Redhel Samy

Physics

James Joseph Haiston
Bhubnesh Lama
Madan Kumar Sharma Timalsina

BACHELOR OF SCIENCE DEGREE CANDIDATES

Applied & Computational Mathematics
Kiley Anne Keck

Biology
Paycen Harroun ***

Biomedical Engineering
Corbey R. Foss
Samantha Leigh Smith

Business Management in Technology
Jeremy Wallace Holwell

Chemical Engineering
Brenton Caleb Brakke
Marina Lea Davidson *
Shelby Rose Guthrie **
Natalie Rose Richardson *
Chandler L. Wilson *

Civil Engineering
Fahbia Rose Ahmed
Cody Michael Allen
Reece Austin Blanton
Mikayla Marie Broekemeier
Garrett Bruce Buckingham
Joshua Daniel Christensen **
Travis Allen Fincher
Douglas Richard Griese
Tucker Franklin Hecht
Erela Rachael Meyer
Sydney Nicole Namtvedt
Faiz Bahaduri Naufal
Justin Matthew Pump *

Tyler Ray Ring ***
Garrett Edward Roach
Haley Dawn Schroeder
Ryan Mern Skillingstad
Andrew Josiah Benjamin Undt
Kasten Eugene Walker

Computer Engineering
Musa Bah
Anoushka Mathews *
Matthew Lewis Pugh *
Mason Alexander Rud
Micah Brandt Runner
Christian Michael Weaver ***

Computer Science
Matthew Krohn
Brennan Lamoreaux *
Taylor James O'Brien

Electrical Engineering
Anthony Dale Benitez
Julianna Sae DeLong
Job Goodale
Messo Hekima
Avery Jackson Mollet
Matthew Lewis Pugh *
Mason Alexander Rud
Micah Brandt Runner
Yvan Cleve Tchokouaga Wakam

Geological Engineering
Anna K. Pagel

Geology

Jimmy Melvin Bradford *
Sydney Pascale McCuiston
Aynsley Brie Melancon
Christopher James Patterson

Industrial Engineering and Engineering Management

Macy Anne Bishop
Allison Paige Comp
Hossameldin Gamil
Kassandra Kaye Herding
Preston Timothy Herring
Colin Howard Linford
Abigail G. Magee
Kyle Garrett Moore
Sydney Elle Morris
Samantha Lynn Sheely
Alexander Joseph Wilson

Interdisciplinary Sciences

Alexandra Rae Rauert *

Mechanical Engineering

Alvin Kenechukwu Aneke
Elise Margaret Flachs ***
Shane Price Good
Logan Michael Juergens
Robert Vern Munyan
Elora Lee Solomon

Metallurgical Engineering

Henri Philip Blancett
Kassidy Yvonne Kitzmiller ¥
Elijah Philip Tragesser
Thomas Alan Williams ***

Mining Engineering

Rhys E. Baker
Joel Lammers
William Robert Wayman
Noah Jordan Williams

Physics

Connor Dale Peterson

Pre-Professional Health Sciences

Mariana Guadalupe Meza
Christian David Singleton

THE TRADITION OF COMMENCEMENT

Dating back to the universities of thirteenth-century Europe, the conferring of degrees signified that faculty members had attained the guild status of a master. Originally, this "master's" degree was the only one offered; the baccalaureate was simply a stage towards mastership. During the ceremony, black robes were worn in imitation of the clergy, for at the time church and university were one. When the hood was placed over the candidate's head, the ceremony was consummated and mastership was achieved.

Over the centuries, graduation evolved to commemorate more than the end of an educational endeavor or the mastership of a craft. It became the start of a new adventure, a passage to professional status recognized by the community of scholars and the community at large.

Today, we call this ceremony commencement, a term defined as both an act of commencing and the ceremony for conferring degrees. In essence, it means a beginning within an end. A middle English term, commencement traces its roots to Anglo-French, Old French, and finally, the Latin word, *cominitiare*, a combination of the prefix *com* and *initiare*, meaning "together, begin," a fitting origin for a word that evokes a graduate's first steps taken in fellowship and a poignant reminder that in each destination lies a new dawn.

ACADEMIC ATTIRE

The use of academic dress stems from costumes used in universities of the fourteenth and fifteenth centuries, particularly at Oxford and Cambridge in England. The dress has been used in the United States since colonial times and was standardized by an Intercollegiate Code in 1895.

The style of gown and hood designate the degree earned. The bachelor's gown is royal blue without a hood and the sleeves are pointed; the master's gown is black and has oblong sleeves; and the doctoral gown is trimmed with velvet, has three distinctive chevrons on each arm, and bell-shaped sleeves.

The two colors on the inside of the hood are traditionally the colors of the college granting the degree. The School of Mines colors are blue and gold; however, the hood for the School of Mines is gold and silver, symbolic of the university's connection to these precious metals. Caps are black mortar boards with the tassel worn over the left front quadrant.

As one may observe from the procession, the faculty wear hoods and gowns of varying styles and colors. The color of the tassel on the hat and the outside velvet trim of the hood indicate the field of study.

THE CEREMONIAL MACE

During today's ceremony, the chair of the faculty will carry the South Dakota School of Mines & Technology's ceremonial mace. The university mace is an academic tradition that dates back to medieval times. The mace has acquired the ceremonial function of "guarding" the president in the tradition of a medieval sergeant-at-arms.

The School of Mines mace was designed to represent the university's many disciplines. The handle was crafted from a fossil and represents paleontology, while the pink quartz sphere, encased in the symbol of an atom, symbolizes both geology and physics. The silver and gold signify the institution's rich mining tradition. The laurel leaf garland crown, fashioned from Black Hills Gold, represents a mark of honor, distinction, and success.

The mace was designed by Ms. Deborah Mitchell, former director of the Apex Gallery and associate professor in the Department of Humanities. The seal was engraved by Dr. Ryan Koontz, integrated manufacturing specialist for the Center of Excellence for Advanced Multidisciplinary Projects.

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PHOTOGRAPHY SERVICES

The Grad Team will be providing photography services to the graduates. Photos will be available online at TheGradTeam.com/events approximately one week after the ceremony.