FALL 2013

Engineering

CHEMICAL CIVIL ELECTRICAL GEOLOGY GEOLOGICAL MECHANICAL PETROLEUM

UND UNIVERSITY OF NORTH DAKOTA
COLLEGE OF ENGINEERING & MINES

Rendering of the concept of the proposed Collaborative Energy Complex.

UNIVERSITY OF NORTH DAKOTA

COLLEGE OF ENGINEERING & MINES

TABLE OF CONTENTS

ENGINEERING
Fall 2013

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Engineering is published by the College of Engineering and Mines at the University of North Dakota. Please send comments and address changes to Deb Austreng at deb.austreng@engr.und.edu or call 701/777-4249

MESSAGE FROM THE DEAN

Time flies, as they say, but I can assure you that it flies at a much greater speed here at UND's College of Engineering and Mines. I can't believe that five years have already passed since I joined UND on July 1, 2008. These years have been very rewarding to me mainly due to our faculty and staff and their commitment to creating an exceptional college. This is also attributed to the hard work of our great students and the many contributions of our extraordinary alumni and friends.

As I am starting my sixth year, I'd like to take a moment to reflect on our progress together and to update you on our performance during the past five years. Each day in these years has brought in a fresh set of challenges and opportunities, and I am very proud of how we overcame the challenges and took advantage of the opportunities.

On these pages, I'm reflecting on our progress and listing some of our achievements over the past five years. The items listed below have contributed to furthering the Exceptional UND priorities: enriching student learning experience, facilitating collaboration, encouraging gathering, enhancing the quality of life of faculty and staff, and expanding the presence and impact of the university beyond the campus.

We are just starting to see the fruits of our vision and the real impact of our strategic plan. In future years, we will see more progress and greater impact as we continue to execute, assess, and refine our strategies. I am so proud of our faculty and staff who work hard each day to advance the college and to provide our students with the best learning experience. I am also so grateful for the generous support of our alumni and industry friends.

With your support and inspired by the North Dakota spirit, I look forward to our bright future and to the excitement awaiting us as we continue the journey that we started together five years ago.

Sincerely,

Hesham El-Rewini, Ph.D., P.E.
Dean and Professor

A Five-Year Reflection

Strategic Planning & College Processes

- We developed a comprehensive strategic plan for the college comprising six Vision Building Blocks: 1) Graduates, 2) Education, 3) Research, 4) Work Environment, 5) Community, and 6) Alumni. The strategic plan has been the product of an inclusive process designed to seek input from and encourage ownership by faculty, staff, students, alumni, and other constituents. The strategic plan can be found under the "College" tab via the following link: www.engineering.und.edu.
- Several college processes have been revisited and streamlined including advising, promotion and tenure, chair evaluation, faculty and staff evaluation, department chair selection, distance education processes, and IT support.
- The College's Promotion and Tenure Guidelines document was revamped and approved by the faculty in Spring 2011. All departments have revised their own promotion and tenure guidelines based on the new college guidelines.

Enrollment, New Programs, and ABET Accreditation

- The College of Engineering and Mines has seen more than 50% increase in total enrollment and more than 100% increase in distance education enrollment since 2008.
- We developed three new degree programs: Ph.D. in Chemical Engineering, M.S. in Sustainable Energy Engineering, and B.S. in Petroleum Engineering.

- We incorporated leadership and entrepreneurship skills in the curriculum.
- All eligible undergraduate programs received ABET accreditation in 2010. The next comprehensive review will take place in 2015-2016.

Research

- The College of Engineering and Mines has seen 100% increase in annual research expenditure since 2008.
- We established the Institute for Energy Studies (IES) to help foster interdisciplinary research, education, and outreach activities in the Energy field. IES is a university-wide institute led and administered by the College of Engineering and Mines.

- We created a research support cluster to help faculty in budget preparation and grant accounting. We are in the process of growing this cluster to include other services.
- In collaboration with the engineering deans at North Dakota State University and South Dakota State University, we founded the Annual Engineering Research Summit to encourage research collaboration among the faculty in the three colleges.

Student Experience and Retention

- We established two new service offices: 1) The Office of Student Experience and Outreach was created to serve and enrich the experience of our existing and prospective students, and 2) The Office of Engineering Information Technology Services was established to provide students as well as faculty and staff with the best computing and information technology capabilities.
- We developed a number of initiatives to enhance the student experience and improve retention. These initiatives include the following:
  - Pre-engineering designation for undecided students.
  - A new class (ENGR 100) to help first year students understand the different engineering disciplines.
  - Creating new positions for advising and mentorship in the newly established Office of Student Experience and Outreach.
  - Establishing the first Living Learning Community (LLC) for a specific college at UND (A designated space in the dormitories set aside for engineering students).

New Academic Units

- We established the new Department of Petroleum Engineering in 2011. The department has had over 130 students in its second year of operation and is expected to have over 200 students in Fall 2013.
- We changed the designation of the School of Engineering and Mines to the College of Engineering and Mines to allow the creation of schools under the college umbrella, with additional options of placing future programs within those schools.
- We established the School of Geology and Geological Engineering to highlight the great opportunities created by the coexistence of a science program (Geology) and an engineering program (Geological Engineering) under one umbrella within Engineering.

Collaborative Energy Complex (CEC)

- Building a new facility connecting Leonard Hall with the rest of the engineering complex has been a dream of the College of Engineering and Mines for decades. The Collaborative Energy Complex (CEC) is a combination of several strategic initiatives for our college. It will provide a common umbrella for interdisciplinary programs in the important field of energy. The building component of CEC will connect Leonard Hall with the rest of the engineering complex. In addition to providing state of the art labs and multipurpose teaching centers, CEC will provide space for interdisciplinary collaboration among faculty and industry representatives in all fields related to energy. CEC will be the home of the newly established Department of Petroleum Engineering and the Institute for Energy Studies (IES). We have completed the planning phase and already started the fundraising phase of the project.

Fundraising Activities

- We raised more than $20 million of total gifts and pledges for the College of Engineering and Mines over the last five years.
- We secured the largest gift in the history of the college ($10M) and the naming of the Harold Hamm School of Geology and Geological Engineering.
- We started fundraising for the construction of the Collaborative Energy Complex. We have already secured 30% of the cost of the project from private donors.

- We streamlined the college's development and fundraising processes. The responsibilities of the development and alumni relations' staff and their relationships with the UND Foundation and Alumni Association were redefined to achieve higher levels of coordination, collaboration, and more efficient use of resources. As a result, the total gift commitment to the College has seen an unprecedented annual increase.

Interdisciplinary Collaboration

- In collaboration with the Department of Entrepreneurship at the College of Business and Public Administration, professional development opportunities are offered to students through the Jodsaas Center for Engineering Leadership and Entrepreneurship.
- In collaboration with the School of Medicine and Health Sciences at UND and the College of Engineering and Architecture at North Dakota State University, a joint graduate program (M.S. and Ph.D.) in Biomedical Engineering has been proposed. The proposal is currently being considered for approval al the university level.
- The following interdisciplinary research and education initiatives led by our college have provided collaboration opportunities to faculty and students across several departments, colleges, and universities:
  - Institute for Energy Studies (IES)
  - Petroleum Research Education and Entrepreneurship Center (PREEC)
  - SUstainable eNergy Research Infrastructure and Supporting Education Initiative (SUNRISE)

New Faculty and Staff Positions

- As a result of the generosity of our donors, efficient utilization of internal resources and reallocation within the college, and the support of UND administration of our new and innovative programs, we have increased the number of faculty and staff members significantly since 2008. After successfully completing all of our current open searches, we will have increased the number of tenure track faculty by ten positions.
- We established the following endowed professorships: 1) The Ann and Norman Hoffman Professor of National Defense/Energetics, 2) The Harold Hamm Distinguished Professor of Petroleum Geology and 3) The Continental Resources Distinguished Professor in Petroleum Engineering.
- We added seven FTE staff positions as well as several research staff and engineers.

Distance Education

- We continue to offer the only ABET accredited distance education program in the nation entirely delivered online with accelerated on-campus lab experience in the summer (Based on April 2010 information from ABET).
- We have partnered with Benedictine College (BC) in Kansas to provide their students with our engineering courses through distance learning. Upon completion of the program, students receive a liberal arts/general engineering degree from BC and an ABET-accredited engineering degree from UND. Similar partnerships with other colleges and universities are being discussed.
- For continuous improvement, we initiated in 2013 a comprehensive assessment of the Distance Engineering Degree Program to review all aspects of the program and gain insight into how we can improve this program for our current and prospective students.

Outreach and Student Recruiting

- We created a new position—Assistant Dean for Outreach and Recruiting—to emphasize the importance of outreach and recruiting activities.
- We sponsored many activities for prospective students including summer camps, K-12 programs, school visits, and college tours.
- Among the many outreach activities, we hosted nearly 1,000 area elementary and middle school students to hear Karen Nyberg as she spoke to the students about her mission to space. We also continue to host teams of fourth through eighth graders from North Dakota and neighboring states who compete in the FIRST LEGO League tournament.
- Our College has been leading the organization of the annual North Dakota Science & Engineering Fair since 2011.

Inclusiveness and Diversity

- We adopted several initiatives to create a welcoming, inspiring and collaborative work environment including Dean's Outstanding Faculty Award, Dean's Outstanding Staff Award, Lunch with your Colleagues (the last Friday of each month), Dean's Wellness Program (ergonomic assessments, wellness sessions, etc.), E-Update Newsletter, and Annual Retreats.
- We started a new tradition of holding several town hall meetings every year to provide the faculty and staff members with opportunities to meet, share views, and discuss issues of interest to the future of the College.
- We supported several initiatives to enhance diversity among faculty, staff, and students including diversity training and awareness activities, outreach programs to attract Native American students, and grant activities to enhance diversity among faculty.

Improving Physical Environment

- We completed more than 25 projects to improve the physical environments for students, faculty and staff. These projects include 1) establishment of two new service suites with 11 offices and work stations, 2) renovation of classrooms, laboratories, and the faculty and staff lounge, 3) creation and renovation of student gathering areas, 4) installation of digital signage and advanced audio/visual and web conferencing equipment in conference rooms and classrooms, and 5) creation of a Hall of Fame area to recognize the accomplishments of distinguished alumni.
- We conducted a comprehensive space study in partnership with UND facilities and a local architecture firm to provide a complete analysis of the current utilization and future needs of space. As a result of the study, the University has agreed to fund a multi-million dollar project to renovate the mechanical infrastructure of the entire engineering complex over two years starting in Summer 2013.

Alumni, Community, and Industry Engagement

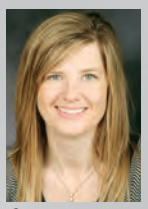
- We created the Executive Board for the College of Engineering and Mines. The board is comprised of senior-level corporate and community leaders who have the experience and vision to help guide strategic directions for the college. During its first meeting in Grand Forks last October, the board selected Sheri McDaniel, President, ATEK Products, to be the first chair of the board. The members also selected Steve Burian, CEO, Advanced Engineering and Environmental Service, to be the vice chair.
- We created a new full time position, Director of Alumni, Corporate, and Public Relations.
- We continue to maintain and nurture strong relationships with alumni, community leaders, and industry friends via many activities including alumni events held both on- and off-campus, individual visits to alumni and college's friends, publication of the new *Engineering* magazine (distributed to over 7500 alumni and friends), and hosting and sponsoring community and industry events.
- We continue to hold several homecoming activities including the well-attended induction of distinguished alumni to the college's Hall of Fame Alumni Academy.

Faculty and Staff Professional Development and Succession Planning

- We provided training and professional development opportunities for faculty, staff, and students. The professional development sessions included the following: Time Management (faculty), Building Trust (leadership team), Entrepreneurship (students, staff, faculty), How to Become a Successful Team Player (students, staff, faculty), Global Energy Challenges Require Leadership from Engineers and Scientists (students, staff, faculty), Globalization (students, staff, faculty), The Wisdom of Caring Leaders (leadership team), Ordinary People, Extraordinary Results (leadership team and Dean's Office staff) , Thoughts on the Role of A Successful Chair (leadership team), The Clarity Imperative – How Getting Everyone on the Same Page Makes Your Organization Stand Out (leadership team), Cultivating Emotional Intelligence: Six Workshops (faculty, staff), Diversity and Inclusiveness (leadership team).
- We have implemented a succession planning process to develop faculty and staff with the potential to fill key leadership positions within the college. The process included semester-long studying of leadership books, sharing best practices and lessons learned on a regular basis, inclusion in the decision-making process, one-on-one mentorship, and professional development training.

Forest Ames

Mike Mann



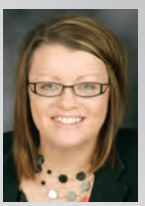
Courtenay White

Dexter Perkins

Lowell Stanlake

Joseph Hartman

Wayne Seames



Tammy Anderson

Saleh Faruque

Major Awards and Recognitions

- Forrest Ames was elected to be a Fellow of the American Society of Mechanical Engineers (ASME), 2010.
- Mike Mann was named Chester Fritz Distinguished Professor, 2010.
- Dexter Perkins was honored as North Dakota Professor of the Year, 2010.
- The late Richard Schultz received the Red River Research Corridor Discovery Award, 2010.
- Joseph Hartman was named Chester Fritz Distinguished Professor, 2011.
- Wayne Seames was named Chester Fritz Distinguished Professors, 2011.
- Saleh Faruque was awarded a Fulbright Scholarship in Bangladesh, 2011.
- The Department of Chemical Engineering received the University's award for Departmental Excellence in Research, 2011.
- William Semke and the late Richard Schultz received the Excellence in Interdisciplinary Collaboration in Research Award, 2011.
- Lowell Stanlake received the Karleen Home Rosaaen Award for Excellence in Academic Advising, 2012.
- Courtenay White received the UND Meritorious Service Award, 2012.
- Wayne Seames received the B.C. Gamble Faculty Award for Individual Excellence in Teaching, Research or Creative Activity and Service, 2013.
- Tammy Anderson received the UND Meritorious Service Award, 2013.

Dean's Initiative

DEAN'S WELLNESS PROGRAM

The workplace wellness program was initiated in the fall of 2012 and included ergonomics assessment for faculty and staff as well as special events including two separate sessions of chair messages held within CEM, making it accessible for faculty and staff to take time out for a five minute session (or two).

LUNCH WITH YOUR COLLEAGUES

Held the last Friday of every month, these lunches give the faculty and staff an opportunity to socialize while enjoying some down time.

CEM IS GETTING ITS

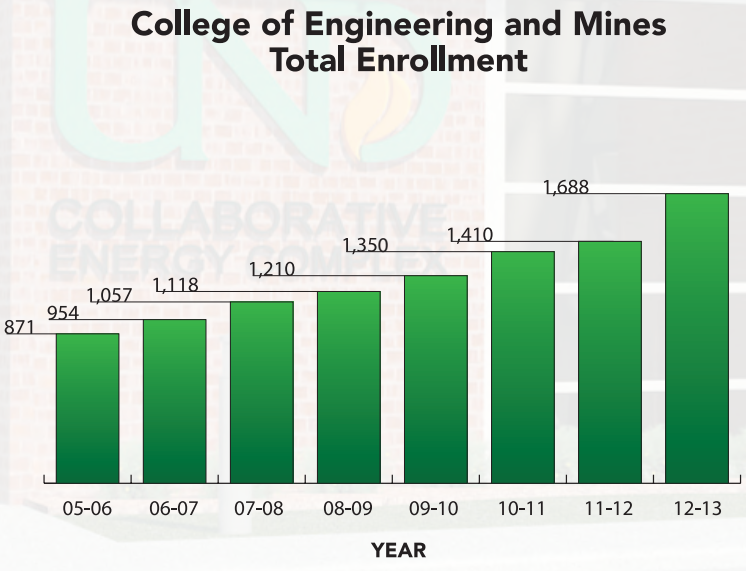
DREAM HOUSE

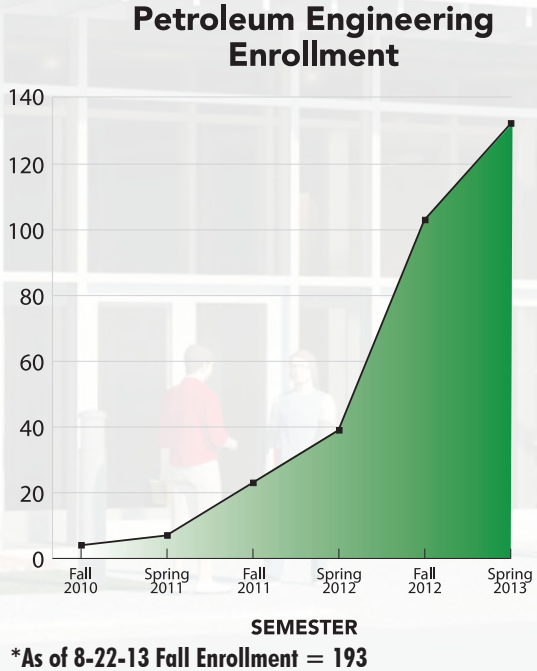
Private Support Driving Successful Effort to Build New, Much-Needed "Collaborative Energy Complex"

A state-of-the-art facility that would connect Leonard Hall on the UND campus with the rest of the University's engineering complex has been a dream of the College of Engineering and Mines for decades, according to Dean Hesham El-Rewini.

Thanks to private donations from generous alumni and friends, the College currently is about 30 percent along in finally realizing that dream. "We have completed the planning phase and already started the fundraising phase of the project," El-Rewini said.

The new estimated $10 million, 30,000 square-foot Collaborative Energy Complex (CEC), as the new facility is being dubbed, will be set on the southeast part of campus between the Harold Hamm School of Geology and Geological Engineering in Leonard Hall and Upson Hall I. The new CEC will bridge the two existing facilities, forming a major engineering education and research complex on campus that will include Upson Hall I & II, Harrington Hall and the nearby Wilson M. Laird Core and Sample Library.





*As of 8-22-13 Fall Enrollment = 193

The CEC primarily will serve as a new headquarters for UND's Institute for Energy Studies and the rapidly growing Department of Petroleum Engineering. Currently, CEM is bursting at the seams with petroleum engineering students, fueled by booming oil and gas exploration in western North Dakota.

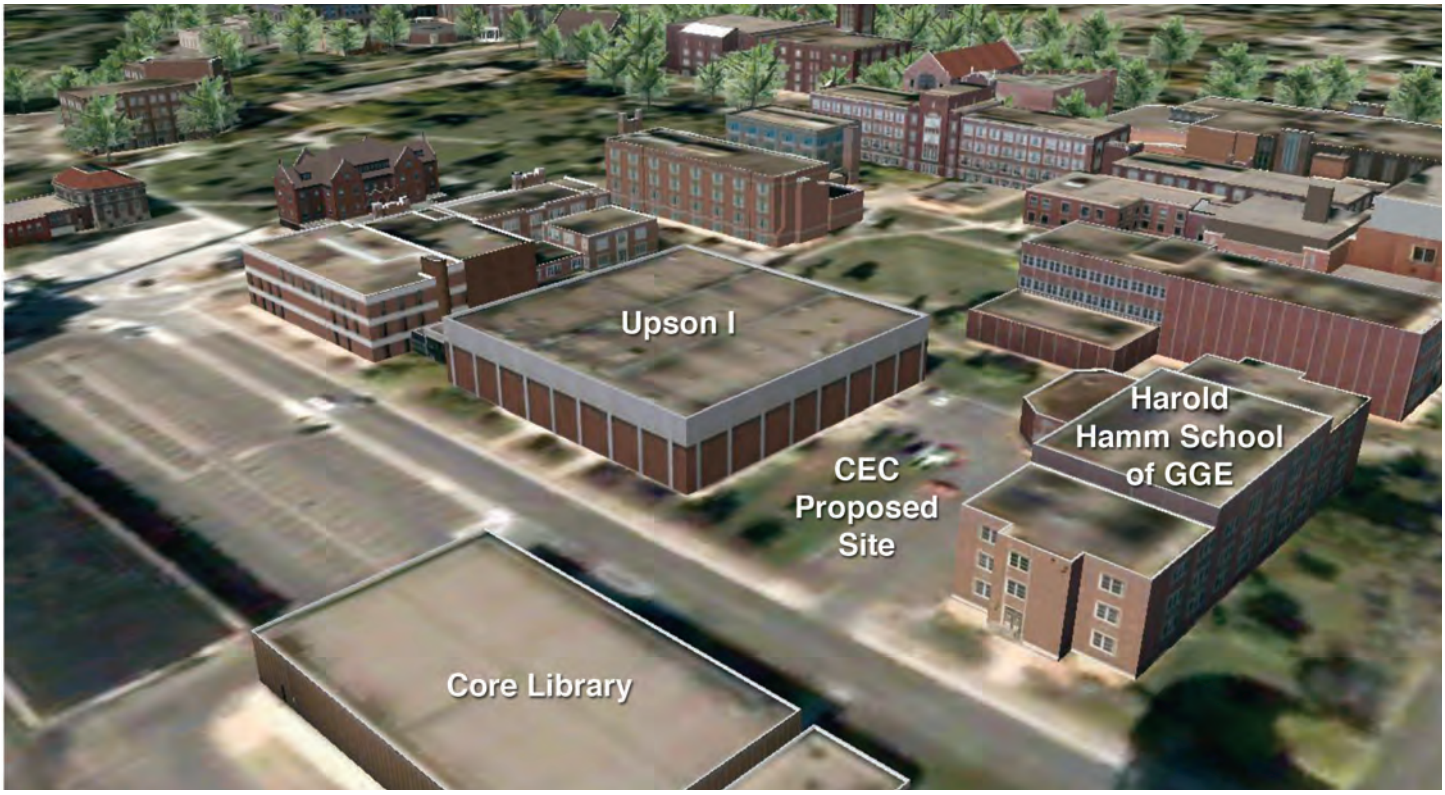
"The proposed Collaborative Energy Complex is an excellent example of the successful private-sector partnerships that UND has fostered in recent years across our academic and research enterprises," said UND President Robert Kelley. "I commend Dean El-Rewini and his College of Engineering and Mines colleagues for their initiative and vision to strengthen these important bonds, which should provide immediate opportunities for students and long-term solutions for the future of North Dakota and the nation."

More than just a building to house programs, El-Rewini stressed that the new facility – as its name suggests – will provide students and faculty with a place to interact with each other as well as with colleagues from other units on

The Collaborative Energy Complex will feature

- 30,000 square feet of research/teaching labs and customized spaces for students and industry
- Industry/student/faculty collaboration space
- Offices for Petroleum Engineering & Institute for Energy Studies
- Ideas Gymnasium for students to explore creative ways to solve global challenges facing the oil and energy industries
- Lobby will feature interactive displays designed to educate and intrigue visitors
- Meeting rooms for students/faculty/industry to promote collaboration/share information
- Physical connection to the Harold Hamm School of Geology and Geological Engineering
- Easy access to the Wilson E. Laird Core Library
- Student Success Center
- Laboratories
  - Unconventional Geomechanics Lab
  - Unconventional Fluid Properties Lab
  - Drilling/Mud Lab
  - Production Lab
  - High Bay Lab
  - Senior Design and Research Computer Lab
  - Visualization Lab

Rendering of the proposed Collaborative Energy Complex.



campus and beyond.

"The Collaborative Energy Complex is a combination of several strategic initiatives for our College," El-Rewini said. "It will provide a common umbrella for interdisciplinary programs in the important field of energy."

"The Solbergs and the Hamiltons are true pioneers and visionaries. I am extremely grateful for their early support of the CEC project. Their gifts of knowledge, experience, and funding will help our college move forward to a greater future." -Hesham El-Rewini

"In addition to providing cutting-edge lab resources and multipurpose teaching centers for students, CEC will provide space for interdisciplinary collaboration among faculty and industry representatives in all fields related to energy," El-Rewini said.

Thomas DiLorenzo, UND vice president for academic affairs and provost, said the new CEC will go a long way in helping UND become an exceptional place for students and faculty.

"The proposed Collaborative Energy Complex is a big and exciting idea well on its way to becoming an important addition to our campus," DiLorenzo said. "Once completed, this facility will enhance our student-centered environment and support interdisciplinary teaching and research for both undergraduate and graduate students – key initiatives in moving the University toward becoming an exceptional UND. "The College of Engineering and Mines should be proud of its efforts and progress."

The major donors

Much of the initial support comes from two UND alumni families in Houston, Texas: Robert "Bob" Solberg and his wife Kristine, and Thomas "Tom" Hamilton and his wife Carolyn.

"I received a great education from UND CEM which enabled us to move from a small town in North Dakota, and earn the respect of most of those we worked with all over the world–Kristine was really good at that. We are supporting the Collaborative Energy Complex to insure our graduates excel in the competitive global energy industry." –Bob Solberg

Robert Solberg

Bob Solberg is a 1969 civil engineering graduate of UND, while Kristine Solberg got her degree from the College of Nursing the same year. Bob currently is chairman of JDR Cable Systems, Ltd., and Kris works as a childbirth educator and community volunteer in Houston.

Tom Hamilton received his master's degree in geology

from UND in 1967, his Ph.D. in 1970, and an honorary doctorate in 1993, all from UND. Since 2003, Tom has co-owned Medora Investments, a private investment firm.

The Solbergs and the Hamiltons have been generous supporters and benefactors to the College of Engineering and Mines and to UND over the years.

"UND provided a first-rate technical and professional platform that served me extremely well through almost four decades in the oil industry. In addition, Carolyn and I developed life-long friendships, which we still treasure. We have been supporting UND for over 35 years. Good habits are hard to break." –Tom Hamilton

Thomas Hamilton

Room to grow

In just eight years, enrollment within the College of Engineering and Mines has nearly doubled to more than 1,600 students, driven by expanded program offerings and opportunities for students to learn and research new and exciting developments in engineering.

One of those new opportunities is in petroleum engineering. In just three short years since the start of the UND Petroleum Engineering program, it has grown from a handful of pioneering students to a whopping 135 students last spring. Program leaders expect as many as 70 additional students to enroll in the program this fall.

"We anticipate the classes that follow will likely have more than 20 graduates each year," said Steve Benson, chair of the UND Department of Petroleum Engineering. "Our faculty also is increasing in size to meet the demands of the additional students."

Other UND engineering programs are growing as well, El-Rewini said.

The boom of students in UND's Petroleum Engineering program is being spurred largely by increased and sustained oil activity in western North Dakota but also because a great number of petroleum engineers and other industry professionals are expected to retire in the next few years.

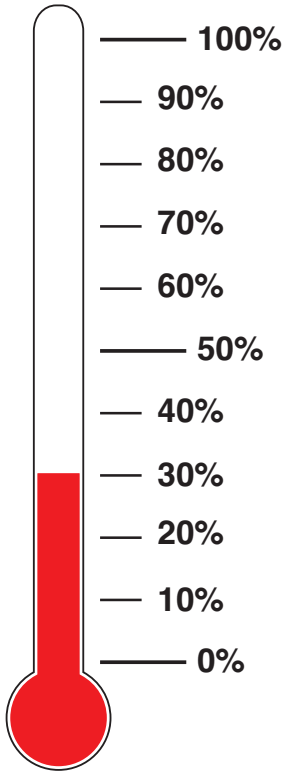
The UND Petroleum Engineering program is the only one of its kind in the state and is among a small number of accredited programs—about 20 or so—in the nation.

UND's College of Engineering and Mines, along with industry friends and alumni, such as the Solbergs and the Hamiltons, hope to seize the momentum of today to build for tomorrow.

And the new CEC is an important next step in making that happen.

David Dodds
University & Public Affairs writer

10 MILLION DOLLAR GOAL



The CEC will change the way we prepare our students to meet the energy challenges of tomorrow. The Collaborative Energy Complex has been identified by University of North Dakota President Robert Kelley as a project eligible for matching dollars from the North Dakota Higher Education Challenge Fund. This program will match $1 from the state, for every $2 donated to the project.

I invite all College of Engineering & Mines dedicated alumni, friends, and corporate partners to be a part of the collaboration. For more information on how your gift can help make this vision a reality, please contact Dan Muus, Director of Development for the College of Engineering & Mines. danm@undfoundation.org, 701.777.2327

-Hesham El-Rewini

CO2 Hunters

UND Steam Plant Becomes Proving Ground for Innovative CEM "Capture-Carbon" Technology

Steve Benson, a carbon catcher par excellence in the College of Engineering, is working on a novel technology for capturing carbon dioxide.

Benson, professor and chair of the CEM's Department of Petroleum Engineering, also is director of the UND Institute for Energy Studies (IES). Along with a team that includes fellow faculty, students and industry, he's developing a capture-carbon technology that's both more effective and cheaper than current methods.

This could be a major breakthrough in the world's ongoing carbon-capture strategies.

Carbon dioxide is one of the main gases resulting from burning fossil fuels such as coal, gasoline and fuel oil. CO2 – a so-called greenhouse gas because it traps the sun's heat – has been proven to be the leading cause of global warming. Thus efforts, such as Benson's, are being developed to figure out new and improved ways to capture carbon dioxide instead of releasing it all into the air.

The CEM technology, called "CO2 Capture by Hybrid Sorption Using Solid Sorbents" (CACHYS, pronounced "catches"), will be available to power plants, including UND's own steam plant. Benson and his team, well-known experts in the field of flue-gas-emissions control, will test this technology on a pilot scale at the UND Steam Plant.

UND President Robert Kelley is supportive of using the Steam Plant for research and educational endeavors.

"In practice, capturing carbon dioxide is complex and currently very expensive," said Benson, who is closing out a year of development on the CACHYS technology. "The big news is that our new sorbent technology is very efficient," Benson said. "We've come up with a technology that's cheaper – possibly a lot cheaper – and much more effective than existing technologies."

The team

The project got underway with $3.7 million from the U.S. Department of Energy and industry (ALLETE, SaskPower and the North Dakota Lignite Energy Council).

The CACHYS team includes Envergex LLC, a small research company located in Massachusetts.

Benson is collaborating with Srivats Srinivasachar, Envergex's president, to refine the CACHYS technology. Envergex and UND developed the original CACHYS concept with funding from the Department of Energy's Small Business Innovation Research Program.

Barr Engineering, an architectural and engineering firm, and Solex Thermal Sciences, an equipment manufacturer, are other team members. The UND home

team includes Dan Laudal, a research engineer and chemical engineer graduate, who is involved in the system design. Harry Feilen, a mechanical engineering student, is building the slipstream system at the Steam Plant.

A crane was used to place two shipping containers near the steam plant. These containers house the equipment used to conduct further experiments under the CO2 (CACHYS) project.

Engineers Harry Feilen (white hardhat) and Kirtipal Barse handled all fabrication and assembly. The containers are joined by a 7 by 8 foot access area between the containers. A 29 foot ceiling made of a material which allows the natural light through reducing the need for more interior lighting. (The ladders were in place only during the construction phase.)

How does it work?

The CACHYS technology uses specially designed sorbents to capture carbon dioxide from flue gas streams. The sorbent is created from low-cost materials that don't cause another environmental challenge. The sorbent with CO2 is then transferred to another vessel where the CO2 is desorbed, or released. The desorbed CO2 is then pressurized and transported to a site for use. The sorbent is then recycled for reuse to capture more CO2.

This picture shows the major equipment in its final location. The pipes on the right and the piece in the middle are all parts of the CACHYS CO2 capture system. The gray equipment in the corner is a bag house to ensure the flu gas is clean and free of particles. The blue part at the bottom is a valve and motor used to transport solid materials from the CO2 capture system.

Once assembled, the portable lab has three levels. The stair case leads to the office which is insulated and separate from the lab area for the instrumentation and controls for the portable lab. The bottom container houses the tools and necessary parts to operate the portable lab.

Benson and Srinivasachar note that capturing carbon dioxide probably works best when it is trapped close to a source, such as UND's Steam Plant.

"Large stationary plants that burn coal, gas, oil, and the like, are big sources of carbon dioxide," said Benson. "Existing carbon capture technology at these point sources can be effective, but it is expensive and impractical."

Therefore, Benson and his team, including Envergex, are working on the CACHYS technology: it efficiently grabs carbon dioxide from whatever source is producing it.

"We've passed the peer review process; now we're moving into the next stage," said Benson. "That involves testing our sorbent and process on the flue gas stream from the UND Steam Plant."

The testing will be controlled and monitored from two repurposed cream-colored truck containers stacked at the base of the Steam Plant's chimney. The goal is to prove the technology in intense daily use over the next year.

"It looks promising, and very efficient," Benson said. "It utilizes low-cost materials that won't cause environmental challenges."

"Also, our sorbents have better capacity," Benson said. "Basically, we're getting 7 to 10 grams of captured carbon dioxide per 100 grams of sorbent, significantly more than with competing sorbents, which can store only 2 to 5 grams."

Working with students

Another key factor in its importance to UND, Benson says, is that the CACHYS project employs many graduate and undergraduate students, providing a teaching and learning platform for the students.

"Now we're moving into the next stage – we're going to run in the slipstream at the UND Steam Plant, which will show the feasibility of our continuous process, both in terms of adsorption and the desorption of the carbon dioxide," Benson said.

Juan Miguel Pedraza, University & Public Affairs writer

UND alumni gather in Cedar Rapids for a satellite party to watch UND beat the Gophers in men's hockey. The CEM alumni collected $500 to contribute to the Richard R. Schultz Memorial Engineering Endowment. With the matching corporate funds it totaled $1,000. Rockwell Collins employs many UND graduates and has been a continuous strong supporter of CEM contributing more than $70,000 just this year alone to support students and faculty.

Charlotte, NC, Alumni Social, November 6, 2012, at Mortimer's, held in conjunction with Geological Society of America annual meeting.

John zumBrunnen, BSME'71, Lori Bickler BSME'88, Paul Havig, BSChE '63

Alumni Hockey Social

Howard Wrigley, BSME'61, ND Lt. Governor Drew Wrigley and Gloria Wrigley

CEM Board Member Robert "Mac" McLennan, President/CEO Minnkota Power Co-op and Dean Hesham El-Rewini

CEM Board Member Terry Severson and Steve Lodoen

Terrance Severson BSEE'65, Michael Lodoen, BSCE'65, Dave Koland, BSBA'72, and Steve Lodoen, BSCE'68

Seattle Alumni Event

UND alumni gathered at Salty's on Alki Beach, June 4, to enjoy great food and conversation.

Rick Dahlen, BSME'77 and Rod Hermes, MS'60

From the Lab to the Boardroom

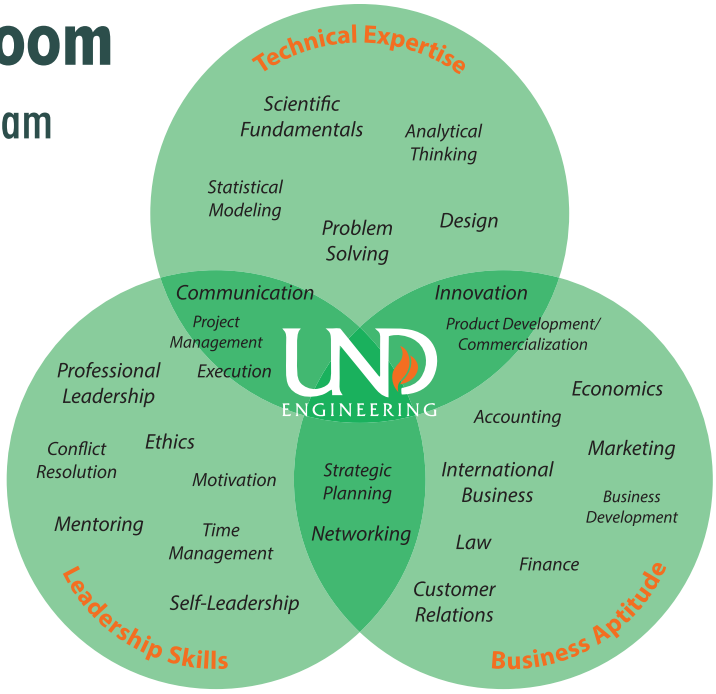
Jodsaas Center Leadership Development Program Prepares Graduates for the Business of Life

There's no doubt that folks who graduate with engineering degrees from the University of North Dakota are technically superb.

That's why most of our graduates are getting good jobs right out of school, many even before they graduate.

But, says College of Engineering and Mines faculty member Brian Tande, there's a lot more to an engineering career than technical expertise. So he launched an effort last year to organize a series of courses to help students learn the ropes of business and entrepreneurship. The new Engineering Leadership Development Program launches this fall with 16 students.

Tande, a chemical engineer, is director of the CEM Jodsaas Center for Engineering Leadership and Entrepreneurship. Dedicated during Homecoming 2008, the center was made possible by a generous donation to the College from 1962 UND electrical engineering alumnus Larry Jodsaas. It was designed and guided by his vision to enhance the student experience by providing engineering students opportunities to develop skills beyond the traditional engineering curriculum.



Skillset of UND Engineering Leaders

"The reason we started this program was the realization that a lot of engineering alums go out into some technical role, doing engineering jobs for three to five years," said Tande, who in addition to his academic career runs a small specialty coatings company. "Then they move into a management position. That's a typical career path for many engineers. So not long after they graduate, they're in a position where they're managing other people and involved with the business side of their company."

Some engineers choose a completely different career path: they go out and start their own company. And some go into completely different roles: Neil Armstrong, the first person to walk on the moon, was an engineer; Karen Nyberg, now doing a six-month stint on the International Space Station, holds a mechanical engineering degree from UND.

"Many of the problem-solving and critical thinking skills they learned as an engineer are put to use in a lot of different fields of business," Tande said. "Our

job in the Jodsaas Center, especially with this leadership development program, is to take our traditional, highly technical education and supplement it with different aspects of business, leadership and entrepreneurship. This is to give students a head start on the skills they're going to need further down the road in their career. That's basically the mission of the Jodsaas Center."

Among the features of the leadership development program is a seminar series.

"Every semester we bring three or four alums from industry back to campus to give a seminar, telling the story of how they got from being a new graduate to where they are today," Tande said. "We also offer a course titled Engineering 410—Technology Ventures, a class in entrepreneurship for engineers.

"We've found that it's not hard to get people here to participate in these seminars. UND is blessed with successful alums who are eager to share their experiences and interact with students. So far, everyone who's participated in our seminar series has enjoyed great discussions with students, who are eager to hear their perspectives. With this program, we're going to be requiring a lot more alums to participate."

To start with, the leadership program will be a College of Engineering-level certificate, which means that it won't show up on a student's transcript.

"We will be working to get approvals from the University and from the State Board of Higher Education to make this a university-level certificate program, which means that it'll be part of a student's official academic record," Tande said.

Tande emphasizes that the program is in addition to the technical and scientific education that UND engineers receive.

"Engineers already are taking a lot of credits," he said. "We looked for ways to add leadership and business credits into existing spaces for electives."

Each student also will be paired with a mentor who works in the same discipline, the same industry that the student is interested in.

"For example, I have a chemical engineering student in the program who wants to work in the pharmaceutical industry," Tande said. "I'm in the process of identifying UND alums who are working in that industry. That's kind of a bridge for the student to learn more about that industry. This summer I'll be working on matching up each of our students in the program with a mentor."

The program is designed to be flexible; students can customize their experience based on their own interests.

"When I was an engineering student no one talked about business, entrepreneurship or leadership skills," Tande said. "Things have definitely changed. The engineering education community has recognized that engineers need more than technical skills."

Right now, this is a pilot program.

"Our long term goal is that every student who graduates from the UND College of Engineering and Mines goes through a program like this," Tande said.

Juan Miguel Pedraza
University & Public Affairs writer

A Coat of a Different Color

UND's Brian Tande Co-Developed a UV-Reflective Paint for Hunting Decoys That is Literally for the Birds

UND's Brian Tande co-developed a UV-reflective paint for hunting decoys that is literally for the birds.

A goose on the wing mostly doesn't see the decoys arrayed on the water by hopeful hunters. At least, it doesn't see them as real geese.

That's because most decoys traditionally are covered in paint that absorbs ultraviolet (UV) light. So birds, such as geese, don't see the decoy as anything more than an object on the water.

But Brian Tande, a University of North Dakota engineering faculty member, and a couple of colleagues developed a paint that reflects UV light. A decoy covered in this stuff really sticks out as far as those geese are concerned.

"We developed an idea for coatings for decoys—waterfowl decoys, turkey decoys and fishing lures—as a product based on some interesting science that has shown that birds can see ultraviolet light," said Tande, who developed this business before coming to UND. "Humans can see light in the visible wavelengths, that is, from 400 to 700 nanometers, violet up to red. Birds can actually see ultraviolet, especially UV-A (which can cause sunburn and skin cancer)."

Their UV-reflective coating solves a problem: prior to 2005 all decoys absorbed UV and, therefore, didn't match the reflectance of actual waterfowl. Bird feathers strongly reflect UV (even though humans can't see it).

"My business partner—a coatings scientist and graduate of North Dakota State—put these pieces together," said Tande, who also is director of the Jodsaas Center for Engineering Leadership and Entrepreneurship in the UND College of Engineering and Mines. "He was the first person to connect the dots. He told me about this in fall 2005. So he, myself, and one other partner started this company. First, we did a proof of concept; we developed some UV imaging technology, and were able to demonstrate that waterfowl feathers reflect UV light, and that currently available decoys did not match that reflectance."

The groups that the trio contracted with to do the testing came back and said there was a huge difference between how snow geese reacted to decoys painted with their new product and how they reacted to regular decoys.

"Then we filed for a patent in 2006, launched our website, developed our brand, and started selling decoy paint online that I made in my basement," Tande said.

"We operated that way for about a year, then signed licensing agreements with a couple of different companies, including a company that has been making decoy paint for decades," Tande said. "We taught them how to make our paint and they've now incorporated our formulations into their coatings. The other company is one of the largest decoy manufacturers in the world. They now also use our technology for their decoys. In fact, a couple of years ago, they started a separate line of decoys that emphasizes the UV-reflective aspects."

Tande and his colleagues were awarded a patent for their special UV reflective coating in 2011, five years after the original application.

"That's my experience being an entrepreneur, what got me interested in getting involved with the Jodsaas Center, which aims to provide engineering students opportunities to develop skills beyond the traditional engineering

curriculum," Tande said.

"We're not making the product in our basement any longer—my wife was rather annoyed with me when I was doing that," Tande said.

Tande and one of his original business partners now have their sights set on the health care market.

"Our next venture is based on a patent-pending coatings technology aimed at health care applications," Tande said.

Specifically, they're developing a product that will help hospitals and other healthcare facilities control hospital-acquired, or nosocomial, infections, such as MRSA, or methicillin-resistant staphylococcus aureus, also commonly called staph infections, which hit close to 2 million patients, killing 50,000 to 100,000 annually.

"These are infections that a patient did not bring into the hospital, but rather acquired while a patient (or visitor) in the hospital," Tande said. "We're working with several companies which are selling new devices to disinfect hospital rooms. It's a robot that is basically a portable UV lamp. You roll this into a vacated room, the machine is remotely turned on, and it irradiates the room with ultraviolet light for anywhere from 5 to 45 minutes, depending on the size of the room and the microbes you are targeting."

"What we discovered is that if you use our coatings technology, you can dramatically reduce the amount of time it takes to kill the infectious microbes by means of UV irradiation," Tande said.

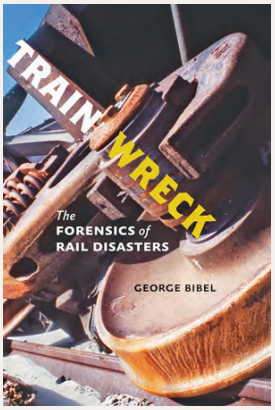
In one particular case, for example, with C. diff, what would normally take 45 minutes takes 9 minutes of UV irradiation; with MRSA, what would normally take you 25 min now takes you 5 minutes.

"That is a new product that we're just in the process of launching," Tande said. "I use it as a real-time case study when teaching students about entrepreneurship."

Juan Miguel Pedraza
University & Public Affairs writer

UND Prof Details Rail Disaster in "Train Wreck"

UND Professor George Bibel Writes Another Book About Transportation Disasters, a Book About Train Crashes to Follow His *Beyond the Black Box*, a Book About Airplane Crashes.



UND mechanical engineering Professor George Bibel has written another book about transportation disasters, a book about train crashes to follow his "Beyond the Black Box, a book about airplane crashes.

Train Wreck: The Forensics of Rail Disasters, commissioned by the Johns Hopkins University Press, details the causes and origins of the worst rail disasters. Bibel also reviews the long and consistent advances in rail safety, some prompted in the aftermath of particularly bad accidents.

Just recently, a coal train derailed in downtown Ellicott City, Maryland, killing two college students who were sitting on the railroad bridge when the accident occurred, said a news release about the book. In 2011, more than 400 trains derailed on main tracks, down 90 percent from 35 years ago.

"Rail travel is much safer than it was, and safer than most other forms of transportation, certainly more efficient," Bibel said. "Unfortunately, we can't reduce the risks to zero."

Some trains weigh 15,000 tons or more and when they collide or go off the rails, their destructive power is immense. In *Train Wreck,* Bibel presents riveting tales of trains gone wrong, the detective work of finding out why, and the safety improvements that were born of tragedy.

Another Norway Connection

UND Institute of Energy Studies and University of Bergen Sign Pact to Promote Student, Faculty Exchanges

The pipeline between the University of North Dakota and Norway just got a little wider with the signing of a student and faculty exchange agreement that centers on petroleum research and synergistic opportunities in the social sciences.

On March 19, 2013, Dean Hesham El-Rewini signed a memorandum of understanding with Pål Davidsen, a faculty member with the Faculty of Social Sciences at the University of Bergen(UiB) in Bergen, Norway. The signing paves the way for two academic and research powerhouses to collaborate efforts on teaching, learning and research aimed at a wide range of energy opportunities and challenges.

The agreement promotes the exchange of faculty, research scholars and students between the two institutions and recognizes each institution as being a leader in higher education, teaching and research within their respective fields of interest. UND's Institute for Energy Studies and Petroleum Engineering programs are growing rapidly and are highly regarded for energy research and education of petroleum engineers for the oil and gas industry. The faculty of Social Sciences at UiB are leaders in System Dynamics education, research methods and technology. The System Dynamics approach combines conceptual and formal computer modeling and simulation with group processes to overcome challenges associated with learning how to design and manage dynamically complex systems. Through the use of virtual computer environments, communication, knowledge sharing, and learning are facilitated by allowing stakeholders to jointly simulate a wide range of policy choices to investigate potential outcomes. Rather than having to wait years to see results, multiple simulations can be completed in minutes. As a consequence, a high level of alignment is possible through the development of shared understanding and trust. In turn, the risk of implementation failure is greatly reduced.

For example, the System Dynamics approach can help the wide range of industry, state, community and academic stakeholders in the North Dakota petroleum development work together synergistically to better understand choices for addressing societal impacts.

"If you are not looking for opportunities like this, that's when you start to have problems," said Davidsen, who represented Knut Helland, dean of the Faculty of Social Sciences at (UiB), at the March signing event.

UND already has a number of academic and cultural links to Norway, including a popular faculty and student

exchange program with the American College of Norway in Moss, Norway.

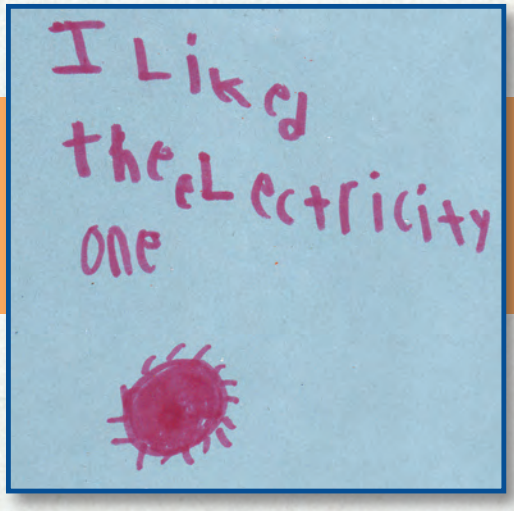
El-Rewini said that beyond the expertise that both institutions can provide each other, UND students and faculty will benefit from working and studying in a different culture in Norway, one of the world's largest oil-producing countries. Scholars from UiB, in turn, gain a foothold close by North Dakota's oil-soaked Bakken formation, one of the largest sources of shale oil and natural gas in North America. They also gain access to a host of unique opportunities and challenges in and around the Bakken to study and to develop master's and Ph.D. theses.

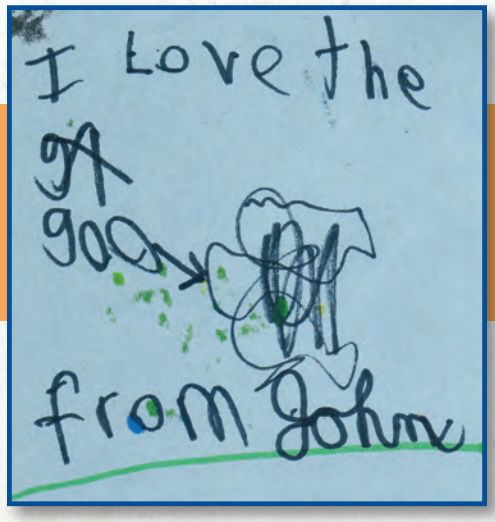
Joining El-Rewini and Davidsen at the signing event were Steve Benson, director of UND's IES and chair of the UND Department of Petroleum Engineering; and Scott Johnson, principal advisor at IES, an instructor in the petroleum engineering department and a former graduate student at UiB. UND Vice President for Research and Economic Development Phyllis Johnson and Wayne Swisher, interim dean of the UND School of Graduate Studies, also attended.

The agreement between UND and UiB is the initial part of what could become a much broader research and exchange relationship between the two institutions.

Fred Meyer, RDO Integrated Controls, demonstrate how to use the new Topcon GPS equipment purchased through the Educational Partnership Program. Pictured are Harvey Gullicks, Chair, Civil Engineering, professors Howe Lim and Daba Gedafa, civil engineering student Brian Mager and Scott Schumacher, RDO Integrated Controls.

CATCHING YOUNG MINDS





Bringing engineering to elementary students at the Grand Forks Air Force Base.

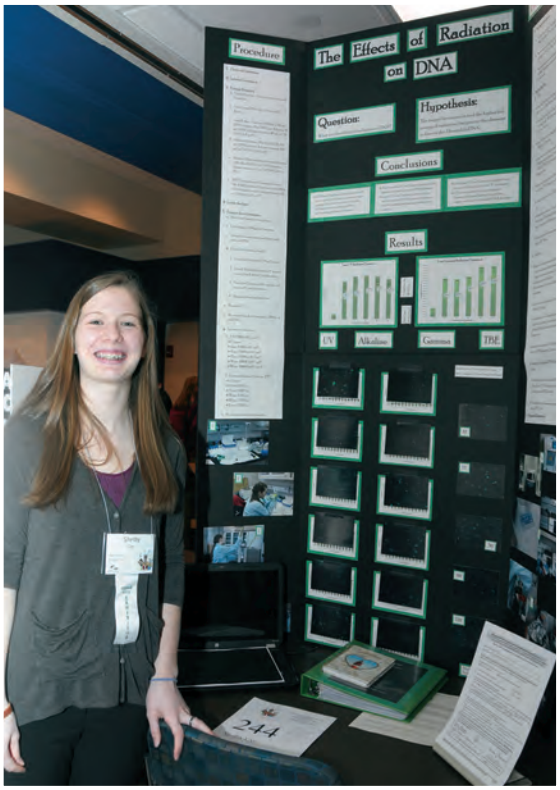
CEM and the Dakota Science Center sponsored a bridge building event at the Grand Forks Library.

CEM partnered with the North Dakota 4H program and the Dakota Science Center to sponsor an Engineering Day for children in the Grand Forks community. Activities included building a toothbrush robot, a can-can robot, and a marshmallow catapult.

OUTREACH

PowerON brought the classroom to Grand Forks Area student, GFAFB and Fisher, MN.

CEM hosted the 10th Lego Competition, February 2013.



Shelby Cyr, Valley-Edinburg, won second place and advances to ISEF, Phoenix, AZ.

The next generation of North Dakota scientists and engineers competed in the 63rd Annual North Dakota State Science and Engineering Fair (ND SSEF) on April 4 and 5, 2013, in the UND Memorial Ballroom.

Senior Design Expo 2013

UND EE Senior Design Project

UND EE Senior Design Project titled "HOUSEHOLD ENERGY AWARE REAL TIME SYSTEM (HEARTS) wins FIRST place both in Andrew Freeman Competition & IEEE Red River Section Competition with NDSU. Congratulations go to Tate Carlson, Evan Edwards and Steve Buchhop.

Students Tate, Steve and Evan with HEARTS station at the Engineering Expo!

(Left) Wally Lang, Vice President of Transmission, Minnkota Power, Tate Carlson, Evan Edwards and project advisor Dr. Prakash Ranganathan

Petroleum Engineering Program Graduates First Four Students for Growing Field in the Oil Industry

They know they're trailblazers, and now they're ready to make a difference.

The first four graduates, Joel Brown, Watford City, ND, Jake Fladeland, Stanley, ND, Tyson Page, Bottineau, ND, and Kyle Wilson, Lancaster, MN, from the University of North Dakota's Petroleum Engineering program, walked across the stage at general commencement Saturday, May 11.

It's a major milestone for UND and for a state where petroleum is a vital and fast-growing industry.

"These guys have been taking heavy course loads–21 units per semester—plus working in the oil industry summers and preparing their senior projects to get through this program," said Steve Benson, Chair. "Initially, when we got this degree program going, we planned to graduate our first class next year, but these students were motivated and ready, and eager to get to work, so we accelerated the program. They rose to the occasion by taking significant academic loads."

In their own words, here are UND's petroleum engineering degree program pioneers:

Joel Brown, Watford City, ND –

I'm a third-generation oil(person). My grandfather, Alfred, grew up around Watford City, got into the oilfields in 1951, worked on drilling rigs for 20 years, then launched Northern States Fishing Tool. That's a key service provider – a fishing tool is sent down a hole to retrieve anything that gets dropped down the well. Then my dad, Gary, took over the business, with my grandfather continuing to work for the company.

I worked for them all through high school in the fishing business, mostly in shop cleaning equipment or running tools to and from locations, doing stuff that no one else wanted to do. In my sophomore year at college, majoring in physics at Taylor College in Indiana, I heard they were starting a petroleum engineering program at UND. I jumped at the chance. Every summer in college, I tried different jobs with different companies to broaden my experience, including roughnecking for Union Drilling.

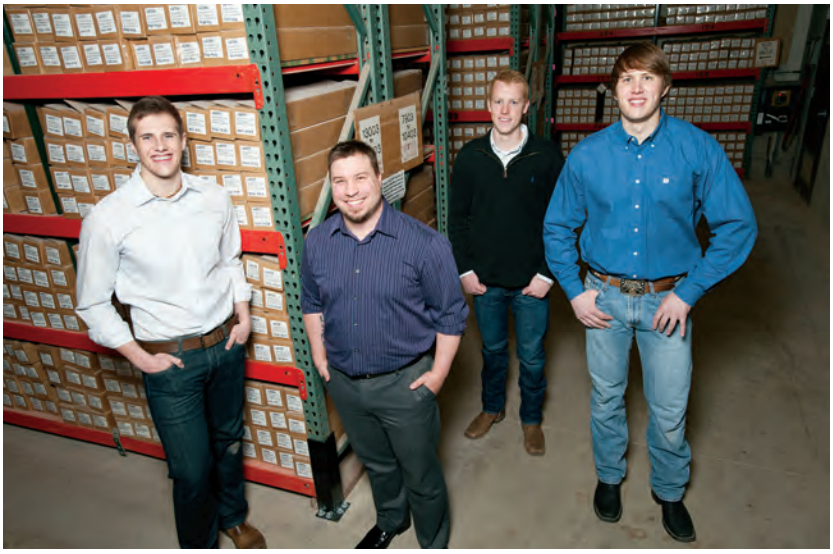
"Roughneck" is slang term for the hard labor jobs on an oil rig.

I've interviewed with several companies. I think I'm going to accept an offer with a company outside North Dakota to get more work experience before moving back to work in the family business.

Jake Fladeland, Stanley, ND –

Like Joel, I'm also a third generation oil(person). My grandpa Jack "broke out" into the oilfield in 1953 when he was 16 years old, my dad, Lannie, did it at 17.

My grandpa worked winters in the oilfields for 38 years, and he farmed the rest of the year near New Town.



UND Petroleum Engineering's first graduates (left to right): Joel Brown, Kyle Wilson, Tyson Page and Jake Fladeland.

My dad worked on the farm but went to the oilfields right out of high school; he was a driller by 21, a tool pusher at 25 and was promoted to the office at 34. He's been a vice president for drilling companies for 12 years, the last nine for Patterson Drilling. There were pictures of me in a hard hat at my dad's tool-pusher shack when I was two.

I found out about the UND petroleum engineering degree program when I was majoring in geology a couple of years ago. I've got a job offer from Cathedral Energy Services, a directional drilling company.

Tyson Page, Bottineau ND –

I grew up around farming and a family-owned manufacturing company, Quantum Industries in Bottineau. I worked summers all through high school on the shop

STUDENTS

floor. I also grew up around airplanes, and I have my pilot's license, too. My grandfather, Owen, farmed and ran an aerial spray business.

I helped around the farm, and at 17, I went to work in the oilfield about 20 miles from Bottineau, near Westhope, ND.

My mom got an aviation degree at UND, and my dad got a UND degree in industrial management. My older brother, Preston, is a landman for a company in Bismarck – he negotiates with landowners for buying and selling mineral rights leases. My sister, who also has her pilot's license, is a freshman in the UND petroleum engineering program.

I've signed a contract with Marathon Oil as a production engineer.

Kyle Wilson, Lancaster, MN –

I served in the Middle East with the Marine Corps after high school.

After my four years were up, I attended Northland Community & Technical College and transferred into engineering at UND. I learned about the petroleum engineering program shortly after coming to UND and signed up right away. I knew it was a good time to get into this industry, with all the folks getting ready to retire. I've signed a job contract with Murex Petroleum Corp., an independent operator based in Houston, with most of its operations up here. Since it's a relatively small company, I'll be a jack-of-all engineering trades, such as drilling, production and reservoir work. It's a good time to be getting in right now.

All four of us were kind of born at the right time because the petroleum engineering industry stopped hiring 25 to 30 years ago, so the middle generation is missing. Now all the older folks are retiring so if you perform well, you'll get promoted fast.

UND Graduates its First Doctorate in Chemical Engineering

Hai Wang walked across the stage for winter commencement 2012 with something really special: UND's first doctorate degree in chemical engineering.

"This is a really big day for me," said Wang, a native of Dalian, a large peninsular city by the sea, east of Beijing. "I was very excited to come to UND because of its reputation in chemical engineering, and I found exactly what I was looking for in my area of interest: polymer materials science, that is, plastics derived from bio-materials."

Wang, who plays a lot of soccer during the warm season, says it was UND's academic and research reputation that attracted him to the program. Wang's advisor, UND chemical engineering faculty member Edward Kolodka, a polymer expert, helped him focus on extracting polymers—or plastics—from bio sources, such as the process used at UND to crack crop oils. Wang's work was funded by a USDA grant as part of the North Dakota SUNRISE program's renewable fuels, chemicals, and materials focus area.

"This is pioneering research – there is very little literature about it, so we know no one else has done this before. We're blazing a new trail," Wang said. "We want to turn these plastics into useful materials—such as foam cups or hockey gloves—but right now it's still all experimental."

Wang's work is part of a larger, overall patented UND process that takes short chain fatty acids produced from crop oils, converts the acids into vinyl ester compounds, and then uses these vinyl ester compounds. Hai's portion focused on using some of the less common vinyl esters that can be produced to generate polymers. Then he tested these polymers to examine their properties.

Wang—whose doctoral dissertation is titled "Study of vinyl ester copolymers derived from bio-source fatty acids"—said chemical engineering research could take him anywhere in the world as he applies for post-doctoral programs.

Kirt Leadbetter Scores Prestigious Goldwater Scholarship for Achievements in Chemical Engineering

UND student Kirt Leadbetter is a little busy these days, and that's the way he likes it.

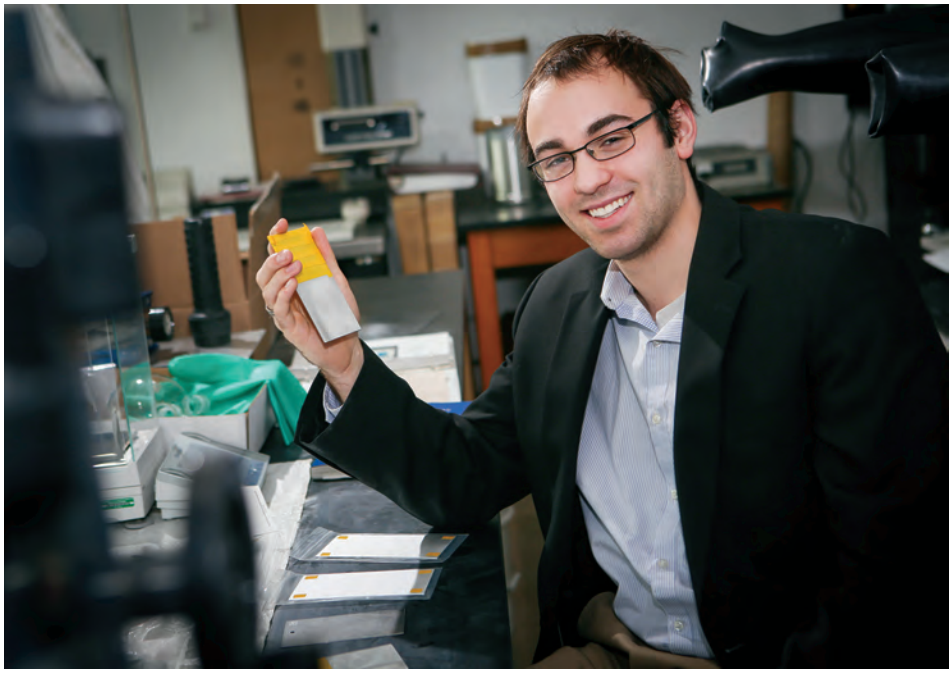
A native of Park Rapids, MN, Leadbetter is pursuing a combined graduate and undergraduate degree in chemical engineering on a five-year program. He has already completed minors in biology, chemistry and mathematics.

"The engineering program at UND is great; it allows for students to choose their own path," Leadbetter said. "Making opportunity happen is an active process; you can't wait around for it. In the chemical engineering program here at UND, I feel this idea is supported. The faculty and staff focus on students and their success. I can say without a doubt that has had an impact on me."

Leadbetter has not only done a lot with his time at UND, he's excelled at it, too! He recently was selected to be a 2013 Goldwater Scholarship recipient. The Goldwater Scholarship is considered the most prestigious award that can be won by an undergraduate student in the sciences. Leadbetter earned his award after writing several essays and receiving strong recommendations, in addition to his impressive academic and research achievements.

"I have great appreciation and thanks for both my research advisor and academic advisor, Dr. Juergen Fischer and Dr. Mike Mann," he said. "Without them, I would not be who I am today or where I am today."

After Leadbetter completes his master's degree and thesis on the electrodeposition of aluminum form ionic liquids, he has no plans to be idle. In fact, his next goal is to enroll into a doctoral program.



Kirt Leadbetter was recently selected to be a 2013 Goldwater Scholarship recipient. The Goldwater Scholarship is considered the most prestigious award that can be won by an undergraduate student in the sciences.

"I will focus on computational combustion chemistry applied to rocket-engine design," Leadbetter said. "So far, my goal dissertation project specifically focuses on development of electrospray ionization propulsion systems. After this, I plan to teach and research at a university or research at a government lab, although I am watching and considering options in the private sector."

In the past year, Leadbetter also has been awarded the Minnesota Power Undergraduate Scholarship and three engineering directed scholarships, plus he belongs to a number of honor societies.

Outside of school, Leadbetter has obtained his Emergency Medical Technician certification, trained hospital dogs, actively trades equity and has begun to pursue entrepreneurial interests.

"I am currently in the process of starting an apartment construction and investment venture here in North Dakota," Leadbetter said.

If that wasn't enough, he's been involved in a local climbing club, snow kiting club and a group of students advocating for conceal-and-carry rights on campus.

Another organization he belongs to that's close to his heart is the PowerON Group. "This group aims to bring excitement and open up opportunities in STEM (science, technology, engineering and mathematics) to students in grades K-12," Leadbetter said.

Marti Elshaug

STUDENTS

Center of Student Experience and Outreach

Dr. Joel Ness is the Undergraduate Experience Director. He serves as faculty in the College of Engineering primarily teaching Statics (Eng201), Dynamics (Eng202) and is involved in the Introduction to Engineering course for freshmen students. Joel advises pre-engineering students, supervises the activities in the Engineering Living Learning Community in the McVey residence hall, and serves as the Academic Affairs supervisory role in the College of Engineering. He is also the advisor to the Engineering Honor Society-Tau Beta Pi and co-advises E-Council. Joel also serves on academic advising and other student oriented committees campuswide.

Mojdeh Mardani is a faculty in Electrical Engineering and the Undergraduate Experience Coordinator. She teaches mostly freshman and sophomore courses. She is also one of the undergraduate experience coordinators for the College of Engineering and Mines. Mojdeh is the faculty advisor for the Society of Women Engineers (SWE). Along with Dr. Joel Ness, Mojdeh co-advises the Engineering Council student group.

Janet Honek is our Undergraduate Experience Coordinator and works primarily on evaluating the Distance Engineering Degree (DEDP) student transcripts. She also works with Dr. Ness on the Engineering LLC, Introduction to Engineering course and assists in the advising process for UND new students. She is a valuable asset to our team.

Ashley Miller is our new Outreach and Student Experience Coordinator. Ashley is active in all areas of outreach and recruiting for the College of Engineering. She is the coordinator for First Lego League, Science Fairs, and other similar engineering related activities directed at elementary and secondary students throughout the region.

Courtenay White serves as our Distance Experience Specialist. She keeps tabs on all of our DEDP students and assists our faculty in coordinating their course materials for delivery to and from the students.

Jessica Anhel is our Student Experience Assistant. She works with all students who come into our office. This involves helping with forms needed to get started at UND to graduation and taking the F.E. Exam.

Mojdeh Mardani, Janet Honek, Courtenay White, Joel Ness, Ashley Miller, Jessica Anhel

2012 CEM Alumni Inductees

Howard W. Wrigley, BSME'61

Howard Wrigley grew up on the family farm in Columbus, ND, a farm that he and his siblings still own today. After completing his enlistment in the US Army, Howard followed his older brother Joseph's lead and attended UND. He credits his father for keeping him on task to complete his college education when Howard searched other options. "I guess actually, my father forced me to go," laughs Howard

Howard started out in Electrical Engineering and later switched to Mechanical Engineering. When he recalls his time at UND he fondly remembers professors Bill Brown and Don Naismith, and he credits Professor Palmer Reiten with lending the guidance he needed.

He began his career working in Bismarck, ND and Moorhead, MN, before becoming the Owner-Manager of the piping division of Peterson, Inc., in Fargo, ND, in 1972. In 1978 Howard founded Wrigley Mechanical, Inc., in Fargo, ND, and today he remains the company's CEO. He holds master plumber's licenses in ND, SD, and MN, as well as a MN high pressure steam license.

He has served as Potentate, El Zagal Shrine, Fargo, ND; Chairman, ND State Racing Commission; and served on the ND State Plumbing Board.

Howard and Gloria have three children; son Blake is president of Wrigley Mechanical, daughter Tanya Wrigley-Lingle (BS'92) and son Drew (BA'88) is North Dakota's Lieutenant Governor. The Wrigleys reside in Fargo, ND.

Alan R. Anderson, BSGE'82

A native of Underwood, Alan Anderson received a Bachelor of Science degree in Geological Engineering from the University of North Dakota and a Masters of Business Administration from the University of Utah.

When asked why he chose engineering as a young undergraduate student, Al credits Dean Alan Fletcher of the School of Engineering and Mines with influencing his decision. That choice served Alan very well.

His career spans over 30 years of leadership and development experience in the oil and gas industry including 19 years with Amoco and BP Amoco in leadership and management positions and ending the last two years of his career serving on the management team for the Tesoro Corporation. Before retiring from the company in 2010, he served as vice president of operations strategy and development, charged with the overall development of future business opportunities and the evaluation of strategic options for the company's future growth.

Alan was enjoying his two months of retirement when in May of 2011, ND Governor Jack Dalrymple called upon him to accept an appointment as Commissioner of the North Dakota Department of Commerce. As Commissioner, Alan oversees the lead agency responsible for attracting, retaining and expanding wealth in North Dakota.

He has served as vice-chair of the ND Oil and Gas Research Council; co-chair of the United Way Campaign, Missouri Slope; chairman of the ND Petroleum Council; chairman of Empower Commission; chairman of the Renewable Energy Council, and served on the Bismarck State College Board of Directors.

Alan and his wife Kelly (Davies, BS'81) have three sons: an attorney, a dentist and a student at Michigan Tech (a member of the hockey team). The Andersons reside in Bismarck, ND.

2012 Sioux Award Recipients Ben and Dorothy Gorecki

In 1962, Ben Gorecki graduated with a Bachelor of Science degree in Electrical Engineering, and in 1963 earned his Bachelor of Science in Business Administration. "It was a team effort," Ben said. While he went to class and worked, Dorothy took care of their children and home, while employed at various jobs.

Four years after Ben's graduation, he and Dorothy founded Gorecki Manufacturing, Inc., in Milaca, MN, a diverse contract manufacturer. For more than 40 years, Ben and Dorothy ran the company, Ben at the helm and Dorothy providing secretarial and payroll support. It started as a family operation making wire harnesses, quickly grew to seven employees, and eventually employed 250. The employee-owned company now boasts 224,000 square feet of production and warehouse space with locations in Milaca, Pierz, and Foley, MN.

Ben and Dorothy contributed a significant portion of the funds to build the Gorecki Alumni Center. Longtime supporters of the University, the Goreckis felt this project was the right fit for them. "It has more to do with furthering education," said Benedict Gorecki. "The fact that the UND Alumni Association and UND Foundation connects alumni with each other and is the fundraising arm for the University really appealed to us."

Ben was inducted into the CEM Alumni Academy in 2007.

2012 Arthur Gray Leonard Award Medal was Presented to Bruce L Ramsey (BS Geology '72, MS Geology '74)

Bruce Ramsey started his U.S. Forest Service career as the district geologist on the Little Missouri National Grasslands, which at the time was part of the Custer National Forest. After chasing oil rigs, seismic crews, and uranium exploration, he moved to the Red Lodge District in Montana the beginnings of the Stillwater Mine (platinum and palladium in the Stillwater Complex). He then moved into the supervisor's office as a Forest Service geologist.

Bruce later worked in the oil business in Casper, WY for several years before returning to the U.S. Forest Service to lead the leasable minerals program as assistant director of Minerals and Geology, later moving to D.C. to become the Beaverhead-Deerlodge National Forest Supervisor.

He is currently the Deputy Director, USDA Forest Service, Minerals and Geology, Denver office.

Faculty Recognized at April 17 Luncheon

The Office of Admissions held its inaugural Faculty/Advisor Appreciation Luncheon on Wednesday, April 17. Faculty and advisors who assist in the student recruitment process, along with the Deans of the Colleges and the Enrollment Management Planning Committee, were invited to attend this event. Awards of Excellence were presented to recipients who have exceeded expectations in meeting with prospective students, answering their questions and accommodating their needs while promoting UND as an exceptional place for students to obtain their higher education.

Michael Mann, Chester Fritz Distinguished Professor and chair of the Department of Chemical Engineering, was also presented the Award of Excellence for his superior service to prospective students by Provost LeBel. Mann's knowledge about the Chemical Engineering profession and departmental research is outstanding. "The way in which he shares that information with students gets them excited about obtaining their higher education at UND," said Paul LeBel, Provost.

The College celebrated the achievements of their colleagues at the Dean's Recognition Luncheon, May 6, 2013

The Dean's Outstanding Faculty Award was presented to

Yeo Howe Lim, Associate Professor, Civil Engineering

Michael Mann, Chester Fritz Distinguished Professor/Chair, Chemical Engineering and Associate Dean for Research

The Dean's Outstanding Staff Award was presented to

Tammy Anderson, Senior Assistant to the Dean/Business Manager

Teri Salwey, Administrative Secretary, Mechanical Engineer

This award, first implemented in 2013 by Dean Hesham El-Rewini, will be given each year in recognition of outstanding performance through a combination of job performance, relationship with colleagues, positive attitude, and the ability to relate their work to the vision of the College of Engineering and Mines.

Yeo Lim, Tammy Anderson, Teri Salwey, Michael Mann with Dean El-Rewini.

The College joined in celebrating advising awards. Michael Mann received the Office of Admissions Faculty/Advisor Award of Excellence; Outstanding Student Organization Advisor Award was presented to Mojdah Mardani(Society of Women Engineers) and Charles Moretti (American Society of Civil Engineers-not pictured).

North Dakota Spirit Faculty Achievement Awards 2013 were given to Steve Benson, Petroleum Engineering; Lowell Stanlake, Mechanical Engineering; Sima Noghanian, Electrical Engineering; Prakash Ranganathan, Electrical Engineering (not pictured). The North Dakota Spirit Faculty Achievement Awards were established to recognize significant contributions by faculty in teaching, research and service. It is funded by the UND Foundation.

2013 Founders' Day Awards

UND Foundation / B.C.Gamble Faculty Award for Excellence in Teaching, Research or Creative Activity and Service was presented to

Chester Fritz Distinguished Professor Wayne Seames, Chemical Engineering

Get connected...

GET CONNECTED WITH UND ENGINEERING

The College of Engineering and Mines has experienced yet another great year and we are certain that as you turned the pages of this latest edition of *Engineering*, you joined us in celebrating the accomplishments of our students, faculty and alumni and were struck by a memory of your experience walking through the halls of Harrington, Leonard and Upson. We would like to hear your story. The success of our students, tomorrow's leaders, relies not only on our educators, but on the success and experiences of our alumni and friends. Consider perhaps becoming a leadership mentor by sharing your career experiences with our students in the classroom as a guest lecturer. We encourage and welcome the opportunity to hear your story as we travel to meet with you or welcome you back to campus. Deb can assist you with making the connections that will best meet the needs of the students, departments and College.

As CEM prepares leaders to take on society's biggest challenges and guided by our strategic plan, the school is continuing to pursue ambitious goals. Support from alumni and friends will ensure continued excellence, and you can help us engineer the way. A dynamic science and engineering curriculum demands modern infrastructure and leading-edge instructional technology. You can help brighten the future of energy education at the College of Engineering and Mines. A gift to support the Collaborative Energy Complex, the latest in the University's projects, will enhance the learning experience across all departments as well the entire UND community. Your gift may be eligible for matching state dollars.

If you are considering lending your support to the college, there are numerous ongoing opportunities. It is our intention to work with you to ensure the stewardship of your gifts of time, talents or treasures.

Deb Austreng

Dan Muus

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We look forward to all that is ahead for CEM and for the opportunity to see and hear from all of you, our alumni and friends in the coming year. Please call or stop in anytime!

Ongoing Opportunities

Unrestricted gifts to support the college's immediate needs provide resources for academic programs, faculty support, scholarships, facilities, and technology and laboratory equipment.

Today's students are tomorrow's leaders and innovators. Private support for ***scholarships*** creates opportunities for talented students to earn a degree, regardless of their ability to pay.

Faculty members are catalysts of intellectual vitality. Support for ***faculty chairs and professorships*** enables us to attract and retain top scholars who bring distinction to the College.

Endowments provide the foundation for continued innovation. Endowed funds sustain and strengthen the educational experience over the long term. Support for endowments provides perpetual funding for high-priority needs.

Please contact Dan Muus for more information about these important initiatives and to learn how you can help propel the future success of the College of Engineering and Mines.


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UPCOMING EVENTS...

September 16, 2013

- **ND Petroleum Council** – Community Expo and Education Session / 3-5 Community Education Session / 5pm Expo with community BBQ

October 10, 2013

- **Sioux Award Banquet (5-8:30 p.m.), Alerus Center**
  5:30-6:30 pm Social / 7pm Dinner & Program
  2013 Sioux Award Recipients include: CEM alumnus Bob Solberg, BSCE'69 and his wife Kris, BSN'69
  Young Alumni Achievement Award Recipient: Chad Syverson, BSME'96

October 11, 2013

- **College of Engineering and Mines Alumni Academy Induction Ceremony and Luncheon (11:30-1 p.m.), Alerus Center, Ballroom 3**
  2013 Inductees:
  Michael Lodoen, BSCE'65
  Terrance Severson BSEE'63
  David Veeder BSChE'61
  Contact Deb Austreng at 701.777.4249 for further details.
- **College of Engineering and Mines/Harold Hamm School of Geology and Geological Engineering Banquet (5:30 Social, 6:30 Dinner & Program), Alerus Center, Ballroom 1**
  Contact Kati Sagstuen at 701.777.2248 for further details.

October 29, 2013

- Denver CEM Alumni Social 5:30-9pm Wynkoop, 1364 18th Street, Denver, CO. All area CEM alumni welcome. Held in conjunction with GSA annual meeting

April 4 & 5, 2014

- 64th Annual ND State Science and Engineering Fair, UND campus

June 2014

- 4th Annual Seattle Area Alumni Social

Contact deb.austreng@engr.und.edu for further information