Creating the future: One student at a time.
Mission
The College of Engineering will uphold the land-grant mission of New Mexico State University through nationally recognized programs in education, research and professional and public service.

Vision
By 2015, the College of Engineering at New Mexico State University will rank among the top 25 public engineering programs in the United States in teaching, research and service.

Goal 1
To be nationally and internationally recognized for academic and research programs in engineering and engineering technology.

Goal 2
To provide excellent engineers and engineering technologists for industrial, government and academic constituents of the College of Engineering.

Goal 3
To be the university of choice for undergraduate engineering and engineering technology education in the region.

Goal 4
To serve as an engine for economic development in New Mexico through the advancement of engineering and technology.

A Message from the Dean
This past fall, with the guidance of leaders from government and industry, we concluded a year of examination and introspection and developed a new strategic plan for the College of Engineering at NMSU. We recorded our baseline, established our targets and created a plan that focuses on establishing the College of Engineering as one of the top 25 public engineering programs by 2015. The plan focuses on national recognition, production of exceptional graduates and development of leading-edge technologies through strong research programs.

We are aggressively pursuing the goals set out by our plan and have already made progress toward reaching some of them:

• Our new freshman enrollment for fall 2006 was increased considerably over the past year and preliminary numbers for fall 2007 indicate that as a continuing trend.
• We added two new professorships during the fiscal year and we are looking to add several more during the next year.
• Our endowments increased from $14.3 million to $20 million.
• Research expenditures held steady in the past fiscal year. However, both proposal submissions and awards were up significantly, which will lead to increased expenditures in future years. Of particular note are NMSU’s participation in the Army High-Performance Computing Research Center contract and participation in the National Renewable Energy Laboratory award for the development and testing of components used in the production of wind energy.
• Our scholarship awards increased significantly in number and amount and the GPA of recipients increased as well.
• Our Hispanic population has grown from 39 percent to 41 percent.
• More than 100 employers sought out our nearly 300 graduates at last year’s Career Expo.

We have an ambitious agenda before us. The assistance and generosity of our many supporters and partners are largely responsible for the achievements and successes of the college. Their support will help us realize our goals. I invite you to be part of this exciting time and help us to create the future, one student at a time.

Sincerely,

Steven P. Castillo
Dean and NMSU Regents Professor
Bridge Inspection Program
Kenneth C. White, director
For more than 35 years, the Bridge Inspection Program has been an important resource for bridge evaluation, bridge inspection training, smart-brIDGE technology development and broad-based research and development.

Center for Space Telemetering and Telecommunications
Stephen Horan, director
NSMSU was designated the first Telecommunication Center of Excellence by the International Foundation for Telemetering for the study of telemetry systems, advanced communications, advanced modulation, coding, data transport and equalization techniques.

Institute for Energy and the Environment
Abbas Ghassemi, director
The IEE is the focal point for faculty-based research and outreach in energy technologies. It serves as umbrella for several significant programs:

The IEE is the focal point for faculty-based research and outreach in water, energy and the environment. It serves as umbrella for several significant programs:

- Institute for Energy and the Environment
- Center for Space Telemetering and Telecommunications
- Carlsbad Environmental Monitoring and Research Center
- Southwest Technology Development Institute
- SWTDI was established in 1977 as an applied research and development center for renewable energy technologies.

WERC: A Consortium for Environmental Education and Technology Development

WERC’s mission is to develop human resources and technologies to address environmental and human health-related issues through education, public outreach and technology development and deployment.

Manufacturing Technology and Engineering Center
Anthony Hyde, director
M-TEC supports economic development in New Mexico by providing education, engineering technical assistance for federal, state and private sponsors.

Carlsbad Environmental Monitoring and Research Center

Established in 1991, CEMRC conducts environmental research and technology development, and disseminates information for federal, state and private sponsors.

Chemical Engineering (BS, MS and Ph.D.)

Degrees Offered

- Aerospace Engineering (BS with MS and Ph.D. pending)
- Chemical Engineering (BS, MS and Ph.D.)
- Electrical and Computer Engineering (BS, MS and Ph.D.)
- Engineering Physics (BS)
- Industrial Engineering (BS, MS and Ph.D.)
- Information and Communication Technology (Bachelor of ICT)
- Mechanical Engineering (BS, MS and Ph.D.)
- Surveying Engineering (BS)

College Staff

2006-2007

Tenured Faculty
53
Tenure-Track Faculty
26
National Science Foundation Cancer Award
5
Endowed Chairs
3
Endowed Professors
11
Research Faculty and Staff
28

College Profile

Fall 2006 Student Ethnicity

<table>
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<tr>
<th>Ethnicity</th>
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<th>Fall 2005</th>
<th>Fall 2006</th>
<th>Fall 2015</th>
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Research

Endowment


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<th>$489,894</th>
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<tr>
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<td>$5,197,762</td>
<td>$5,738,634</td>
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<tr>
<td>Building/Equipment</td>
<td>$13,664</td>
<td>$13,664</td>
<td>$14,592</td>
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<tr>
<td>Scholarship</td>
<td>$7,868,725</td>
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<td>$9,133,714</td>
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<tr>
<td>Research</td>
<td>$226,050</td>
<td>$227,133</td>
<td>$444,248</td>
</tr>
<tr>
<td>Total</td>
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<td>$14,290,339</td>
<td>$20,131,552</td>
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Endowments


<table>
<thead>
<tr>
<th>Source</th>
<th>$11,745,394</th>
<th>$14,290,339</th>
<th>$20,131,552</th>
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<tbody>
<tr>
<td>University</td>
<td>$11,745,394</td>
<td>$14,290,339</td>
<td>$20,131,552</td>
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<tr>
<td>Endowments</td>
<td>$11,745,394</td>
<td>$14,290,339</td>
<td>$20,131,552</td>
</tr>
<tr>
<td>Gifts</td>
<td>$11,745,394</td>
<td>$14,290,339</td>
<td>$20,131,552</td>
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Fall 2006 Scholarship Awards

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<tr>
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<tbody>
<tr>
<td>Total Scholarships</td>
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<td>$462,510</td>
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<tr>
<td>Average GPA</td>
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<td>3.74</td>
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<tr>
<td>Average Award</td>
<td>$804</td>
<td>$1,058</td>
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Scholarships


| Number of Scholarships Awarded | $549,338  | $462,510  |
| Average GPA of Scholarship Recipients | 3.39      | 3.74      |
| Average Scholarship Award       | $804      | $1,058    |

Overall College Enrollment


| Undergraduate | 9,192 | 11,820 | 11,230 | 14,530 |
| Graduate     | 1,192 | 1,320 | 1,270 | 1,870 |
| Total        | 10,384 | 13,140 | 12,500 | 16,400 |

Research Expenditures


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<td>$1,029,481</td>
<td>$32,893,999</td>
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<td>PSL/VPR/Internal</td>
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<td>$190,613</td>
<td>$32,893,999</td>
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<tr>
<td>Matching</td>
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<td>$190,613</td>
<td>$32,893,999</td>
<td></td>
</tr>
</tbody>
</table>

Totals


<table>
<thead>
<tr>
<th>Total</th>
<th>$11,745,394</th>
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<th>$20,131,552</th>
</tr>
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<tbody>
<tr>
<td>Gifts</td>
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<td>$14,290,339</td>
<td>$20,131,552</td>
</tr>
<tr>
<td>Gifts to Endow $1,029,481</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Corporate</td>
<td>$4,583,172</td>
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<td>$1,029,481</td>
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<tr>
<td>Matching</td>
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<td>$32,893,999</td>
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<tr>
<td>Total</td>
<td>$11,745,394</td>
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<td>$20,131,552</td>
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Faculty and Staff

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<th>Faculty and Staff</th>
<th>2005-2006</th>
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<tr>
<td>Endowed Professors</td>
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<tr>
<td>Research Faculty and Staff</td>
<td>28</td>
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Endowed Chair/Professorship


<table>
<thead>
<tr>
<th>Source</th>
<th>$5,231,459</th>
<th>$5,197,762</th>
<th>$5,738,634</th>
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<td>University</td>
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<td>$20,131,552</td>
</tr>
<tr>
<td>Endowments</td>
<td>$11,745,394</td>
<td>$14,290,339</td>
<td>$20,131,552</td>
</tr>
<tr>
<td>Gifts</td>
<td>$11,745,394</td>
<td>$14,290,339</td>
<td>$20,131,552</td>
</tr>
</tbody>
</table>


| Total             | $405,497  | $499,535  | $499,854  |
| Endowed Professorship | $3,231,459 | $5,319,762 | $5,738,634 |
| Building/Equipment | $13,664   | $13,664   | $14,592   |
| Scholarship        | $7,868,725 | $8,420,225 | $9,133,714 |
| Research           | $226,050  | $227,133  | $444,248  |
| Total              | $11,745,394 | $14,290,339 | $20,131,552 |
Students receive EPA funding for border water treatment research

Skills learned while studying to become a chemical engineer are something Andy Torres can take back home and share with her community in Palomas, Mexico. Torres worked alongside two other junior chemical engineering students at NMSU, Ryan McCool and Laura Nunez, and Las Cruces High School student Mi Deng, to clean up drinking water in the border region.

"I have a personal interest in our water treatment project because I am from Mexico and the project involves USA-Mexico border water treatment," Torres said.

The students were researching a cost-efficient method of reducing the high levels of arsenic and fluoride found in Columbus, N.M., and Palomas, Mexico, drinking water. In September 2006, the NMSU team was one of 42 selected for Phase I funding from the U.S. Environmental Protection Agency to participate in the People, Prosperity and the Planet National Student Design Competition. The annual competition requires students to develop progressive solutions to environmental issues while considering the economic impact. The NMSU project, Drinking Water Purification for USA-Mexico Border Region, was awarded $10,000. The students prepared over the next eight months for the national design competition held in Washington, D.C., in April.

Columbus, N.M., residents are allowed five gallons of water per day because the community cannot afford a large water purification facility, said Shuguang Deng, chemical engineering associate professor and head of the student research team.

"If you have a big household that's not enough water. A lot of families just drink the contaminated water they have and they don't really know that there's a problem with that," said Deng.

The students used mesoporous alumina to remove arsenic. The different sizes of pores found in the various mesoporous alumina materials make it effective for adsorbing harmful water pollutants. The material was successful in removing arsenic, but was not as effective in removing fluoride. Although the NMSU team was not selected for Phase 2 funding, Torres will continue working on the project and will present the results at the 2007 American Institute of Chemical Engineers' annual meeting in Salt Lake City in November.

"This project is important to the people in those small villages who definitely need quality drinking water and also maybe to big utility companies," Deng said. As for Torres, she's just glad to have the opportunity to work on a project that could potentially have a positive impact on her community.
Researchers solve key problem in laser communications technology

NMSU researchers have developed a new and effective method for overcoming one of the major obstacles encountered by free-space laser communication systems – the signal interference caused by atmospheric turbulence.

Free-space laser communication can be thought of as a “wired” optical communication, said Michael Giles, professor emeritus of electrical engineering. Unlike fiber-optic systems, in which an optical signal travels along a fiber from a transmitter to a receiver, free-space laser communication uses a laser beam to transmit the signal through the atmosphere.

The technology’s advantages over radio-frequency communications, including high-capacity data rates and security, make it attractive for purposes such as sending live video signals from an unmanned aircraft to a station on the ground, among other applications. But a number of practical problems need to be solved, including the signal loss caused by atmospheric turbulence.

With funding from the U.S. Air Force Office of Scientific Research, Giles and Qingsong Wang, a graduate student who just completed his doctoral degree in electrical engineering, have devised a solution, protected by a patent application, that dramatically reduces signal error rates in laboratory tests in which a laser beam is transmitted through artificial turbulence.

The next stage in the project will be to build a transmitter and receiver for testing the performance when the beam is transmitted a few hundred yards through actual atmospheric conditions.

The NMSU research, funded for a total of $1 million by the Air Force, is in the third year of a five-year contract. Other challenges of free-space laser communications technology, such as transmitting through fog or clouds, are also being addressed.

In addition to military applications of interest to the Air Force, free-space laser communication has potential applications in medicine and other fields, Giles and Wang said.

“In medicine, sometimes they need to transmit beams through turbid media or even through tissue,” Giles said. “This same kind of effect happens if you are trying to image through tissue.”

For military communications, free-space laser systems offer the advantages of high bandwidth and greater security, Giles said.

“It’s more highly directional than radio-frequency communication, which sends the signal in all directions,” he said. “Not everybody is going to be able to receive it – only the one you’re pointing to.”

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Engineering Technology and Surveying Engineering

NMSU faculty-student team designs X PRIZE launch pads

Engineering student Kevin Angeles had a blast in Dallas – a rocket blast, that is. And the concrete slab he helped create performed just fine, thank you.

Four thousand pounds of thrust. Five thousand degrees Fahrenheit. That’s what the launch and landing pads for the X PRIZE Cup’s Lunar Lander Challenge had to be able to withstand.

Planners of the X PRIZE Cup’s 2006 events, held in October at the Las Cruces International Airport, approached Sonya Cooper, academic head of the engineering technology and surveying engineering department, for help with the launch pad designs.

Angeles, a senior civil engineering technology major, took on the challenge as a special projects class under Cooper’s supervision. As a first step, “we researched different concrete mixes and admixtures,” Cooper said.

The civil engineering technology curriculum includes an entire course on concrete and asphalt technology, she said. But this was not your typical panic slab or concrete highway.

The X PRIZE folks needed free pads, each 10 meters in diameter – about 33 feet – and six inches thick. Each pad had to be strong enough to withstand the extreme pressures and temperatures of rocket-powered vehicles taking off and landing vertically. And one of them had to resemble the lunar surface.

“Some of our business has ever been told to mess up a slab,” Cooper said with a chuckle. They used boulders to create craters and depressions and pigment to mimic the color of the surface of the moon.

The mix design Angeles and Cooper came up with was based on one used for Harrier jets, which have engine nozzles that can direct the thrust downward for vertical takeoffs and landings.

In the department’s concrete lab, they mixed up a trial batch. After it cured for six days, they performed a compression test; the concrete tested downward for vertical takeoffs and landings.

“Once it dropped, it broke,” Angeles said. “Still, the slab withstood the 5,000-degree heat of the blast with no trouble. That cleared the way for placing the full-size launch pads at the airport in preparation for the big event.
Red chile farmers and processors get help from NMSU faculty

The industry that brings New Mexicans one of their favorite spicy foods will be getting some help from an industrial engineering professor and other faculty at NMSU. Delia Valles-Rosales, assistant professor of industrial engineering, is working on a project that will optimize red chile processing, saving money and preventing wasted crops. Valles is working with Jim Libbim, agricultural economics and agricultural business; Chris Erickson, economics and international business; and Maria Mariani, mathematical sciences. Also helping are graduate students Maria Pia Beccar-Varela, mathematical sciences, and Donovan Fuqua, mechanical engineering.

The project began in 2005 with a grant from the Economic Development Administration (U.S. Department of Commerce). The goal of the project is to increase the profitability of the dry red chile industry by finding the most efficient combination of production and harvest practices.

Some chile farms still use laborers to harvest by hand, but in order to stay competitive many farms have switched to machines. However, the news delivery systems have created a scheduling problem for chile processors, who dry the large amounts of chile during the peak harvest season. As a result, the farmer may be told to retain some of the crop until it can be processed. Chile can only be stored for 24 to 36 hours between harvesting and processing before it begins to ferment, resulting in wasted crops. Valles is working with Jim Libbin, agricultural economics and agricultural business; and Maria Mariani, mathematical sciences. Also helping are graduate students Maria Pia Beccar-Varela, mathematical sciences, and Donovan Fuqua, mechanical engineering.

The project is also investigating how storage methods can be improved. Instead of building something new, we are thinking of using storage and harvesting among farmers.

A discrete-time simulation model was created to model the harvesting and processing season and make scheduling improvements. The group is also investigating how storage methods can be improved. "Instead of building something new, we are thinking of using storage and harvesting among farmers," Valles said.

The harvesting season for red chile begins in mid-September and ends around mid-January. "When is the right time for the processors to collect chile from the farmers so that the farmers don't lose money, don't waste their chile, and are ready to send it to the processors?" Surveys were conducted at 180 farms in New Mexico, Arizona and Texas to determine transportation methods, type of harvesting, optimal harvest time compared to actual harvest time and how much crop was lost due to differences between optimal and actual harvest.

The three primary processors used by southwest chile farmers were also surveyed to find their processing rates, production targets, the beginning and ending of their processing season and how they determined the order of harvesting among farmers.

"Instead of building something new, we are thinking of using storage and harvesting among farmers," Valles said. "We're hired to create a balance," Valles said. "When is the right time for the processors to collect chile from the farmers so that the farmers don't lose money, don't waste their chile, and are ready to send it to the processors?"

The harvest season for red chile begins in mid-September and ends around mid-January. "When is the right time for the processors to collect chile from the farmers so that the farmers don't lose money, don't waste their chile, and are ready to send it to the processors?"

Researchers take cues from tiny bird

Researchers take cues from tiny bird

Nature serves as an inspiration for many technologies, and researchers in the College of Engineering are taking their inspiration for a micro-air vehicle (MAV) design from the hummingbird.

The researchers are using a scale model that can mimic the wing motion of an actual hummingbird, allowing accurate measurements and observations of how air flows around the wings as they flap.

MAVs can be used in a wide range of important surveillance and tactical reconnaissance missions. However, vehicles measuring 10 centimeters or less might have a problem with hovering and vertical flight in windy conditions. This has led to research on how animals like hummingbirds fly and hover.

The principal investigator for the project is James Allen, assistant professor of mechanical engineering. The co-investigations are Banavara Shashikanth, assistant professor of mechanical engineering, and Pedro Ferreira de Sousa, a postdoctoral fellow in the mechanical engineering department.

Master’s student Jeremy Potts is performing experiments with the model and doing data collection. Another master’s candidate, Scott Hightower, was on the research team until his graduation in the spring. The three-year project is being funded by the Air Force Office of Scientific Research.

The model was designed by Hightower and built by the physics department. It is being tested in the Low Turbulence Water Tunnel. The project will be conducted in two phases. The goal of the first phase is to gain more understanding of the relationship between wing movement and forces during flapping-wing hover, and to begin to develop analysis tools that will help build and assess flapping-wing MAVs.

"A basic goal is to understand how the hummingbird uses vortices," Shashikanth said. "Vortices are basically circulation regions of the fluid flow. Hummingbirds are capable of amazing maneuvers, like hovering. It is strongly believed that they can do this by efficiently extracting momentum and energy from vortices shed by flapping their wings, but the physics and the fluid dynamics involved are still not very clear." So we want to understand these fundamental issues better and then apply it to our models.

The second phase will include studying the model’s forward flight. The researchers will create a kinematic flight-control scheme for flapping-wing MAVs operating in windy conditions, and use this scheme to develop a prototype flapping-wing air vehicle.

"Such MAVs are useful for both scientific and military applications," Shashikanth said. The research will be used to design vehicles that can perform tasks a human-operated vehicle could not. "These could be missions where you don’t want to risk human life. Or it may be something that requires a lot of endurance, beyond the capacity of humans."
The process calls for trucks loaded with thousands of pounds of chiles to dump them into a giant bin. The chiles would then be rolled out on a conveyor belt, where they are lined up and prepared for the destemming process.

Tecoma Technologies in Tempe, Ariz., has created a system that incorporates the use of a camera, a machine-vision algorithm that determines the best time to cut the stems of chiles that vary in size and shape with the least amount of waste and without damaging the fruit. M-TEC researchers to test new chile destemmer machine. The machine uses electronic sensors to determine which plants in rows need to be cut. It also was developed by M-TEC.

The current single-lane prototype system has one conveyor belt that is designed to process 1,000 pounds of chile per hour.

The process uses four gallons of water a minute, which is much less than what is used with current chile processing. A filtration system to recycle the water will also be tested. The current single-lane prototype system has one conveyor belt that is designed to process 1,000 pounds of chile per hour. The goal is to have four machines each having 10 lanes that will process 40,000 pounds per hour.

Plans call for the destemmer system to be finalized and sent to a manufacturer in the fall of 2009 to have the actual machines to be available in fall of 2009.

“We need to do everything we can to keep the industry competitive with the influx of foreign competition,” Gene Baca, president of the newly-formed New Mexico Chile Association (NMCA) said. “We need to get automated. Right now, we’re dependent on too many people because it’s hand-picked and hand-processed.”

Baca, who is also general manager of Albuquerque-based Bueno Foods, estimates it will take a financial commitment of $8 million over the next three to five years to mechanize the state’s chile crops. Baca and his fellow NMCA board members Lou Bied of Bad Chilli and Dino Cervantes of Cervantes Enterprises have been able to acquire a portion of that needed funding from the New Mexico State Legislature.

In 2005, the first chile thinner rolled off the line at CEMCO, a Relen, N.M.-based manufacturer, which get the license from NMCA to make and markets the machine. The machine uses an electronic sensor to determine which plants in rows need to be cut. This technology was developed by M-TEC.

Manufacturing Technology and Engineering Center

NMSU researchers are well on their way to mechanizing the state’s chile industry. Engineers and researchers from the College of Engineering Manufacturing Technology and Engineering Center (M-TEC) and Sandia National Laboratories began testing the second-generation prototype chile destemmer in August 2007. They performed a small-scale demonstration for last year’s chile harvest. The new prototype is designed to process 3,000 pounds of chile per hour.

The Institute for Energy and the Environment (IEE) has teamed with the Tecnológico de Monterrey in Mexico and the NMSU Office of International Programs as part of the National Science Foundation Partnerships for Innovation Program. Focal points of the program include development of an inexpensive wind turbine for grid applications, identification of wind-energy sites along the border, commercialization of the first border wind farm, and support of wind industry development in the region.

Wind is the world’s fastest-growing energy source, reports the Earth Policy Institute. The U.S. now has more than 10,000 megawatts of installed wind-power capacity and the total is projected to grow to 200,000 megawatts by 2030. New Mexico is one of the top 10 states in wind-power generation and potential, with more than 400 megawatts already installed.

“Our wind energy commercialization project is evolving to support the energy, economy, security, and the national vision of 20 percent domestic electricity production from clean, renewable wind energy,” said Abbas Ghassemi, IEE director.

NMSU engineering students Diego Benavidez and Zach Mills and business students Jacqueline Sanchez and Marcos Muroff are conducting evaluations and research as part of the NMSU wind program. The business students are assessing the political and economic requirements of developing small (5-10 megawatt) wind farms on Mexican ejidos (cooperative farms and ranches) that promote local economic development. The project includes assisting the Mexican Environmental Secretariat in establishing guidelines for development of wind farms and identifying appropriate locations for them.

The NMSU student team also is assessing the feasibility and economic of establishing a wind farm in southern New Mexico. Promising sites have the potential to become commercial wind farms on the border, creating jobs and opportunities while providing non-polluting power.

The NMSU wind energy program is supported by contracts with the National Science Foundation, the United Nations Development Program, NASA, the National Renewable Energy Laboratory and the U.S. Department of Energy Windpowering America Program.
Sevostianov receives research award

Igor Sevostianov, assistant professor of mechanical engineering, received a University Research Council Award for Exceptional Achievements in Creative Scholarly Activities. Sevostianov received the $2,000 Early Career Award at NMSU’s Fall Convocation in August 2006.

Sevostianov’s research has important implications for the development of improved materials for surgical bone implants, as well as for metal composites with special properties – automotive materials that are similar to bone for use in surgical implants. He also is working on developing inhomogeneous materials and material design.

Robert Paz, associate professor in Klipsch School of Electrical and Computer Engineering, was chosen as one of 11 university faculty from around the country to participate in the Boeing Welliver Faculty Fellowship Program.

During summer 2006, Paz spent the initial week of the program in Seattle, followed by a six-week assignment touring Boeing plants in Anaheim, Long Beach, Huntington Beach and El Segundo. The southern California sites are home to many of Boeing’s defense and space-related facilities, Paz said.

Sevostianov and his students are designing materials that are chemically similar to bone for use in surgical implants. He also is working on developing metal composites with special properties – automotive materials that are lightweight but capable of absorbing impact energy in a collision, for instance, and materials that can provide a heat barrier for the blades in turbine engines.

Sevostianov, who received his Ph.D. in solid mechanics from St. Petersburg University in Russia, joined the NMSU faculty in 2001.

Student Accomplishments

Two NMSU engineering students have received the Barry M. Goldwater Scholarship, a prestigious award designed to encourage outstanding students to pursue careers in mathematics, the natural sciences and engineering.

Mohammad Ghassemi and Kwame Porter-Robinson were among 517 students from around the nation who received the $7,500 award for the 2007-08 school year. They were chosen from 1,110 students nominated for the scholarship by university faculty and are the only students in New Mexico to receive the award.

Both students are majoring in electrical engineering and applied mathematics. Brenton Taft, a mechanical engineering major, received an honorable mention.

Ghassemi’s career goals involve both engineering and medicine; he plans to earn a Ph.D. in biomedical engineering as well as an M.D.

Porter-Robinson plans to pursue his doctoral degree in control systems engineering, a field of study he chose because it seemed broad.

Taft would like to pursue a career in the defense industry and has worked on research with the Air Force.

Student selected for social responsibility program

NMSU freshman Tamra Overcast is one of eight students nationwide selected recently to participate in the Sullivan Fellowship Program, sponsored by General Motors and the United Negro College Fund, designed to foster social responsibility in the workplace. She will receive a $5,000 scholarship upon the successful completion of a GM summer internship and a written and oral presentation on the Sullivan Principles.

The award also includes a $5,000 grant to NMSU to be applied toward the student’s tuition for the 2007-08 school year. They were chosen from 317 students from around the nation who received the $7,500 award for the 2007-08 school year. They were chosen from 1,110 students nominated for the scholarship by university faculty and are the only students in New Mexico to receive the award.

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NMSU students Mohammad Ghassemi and Kwame Porter-Robinson are the only students in New Mexico to receive the honor.
Students take first place in engineering contest

Five NMSU engineering students who barely knew each other teamed up to design a first-place-winning “human-powered water distiller” and will go on to an international competition in November 2007.

The students won the distinction at the American Society of Mechanical Engineers Design Contest held in April in Tulsa, Okla. The ASME contest design team was inspired by the 2004 tsunami and Hurricane Katrina, after which people were surrounded by water but none of it was safe to drink. Since electric power was not available, one possible solution would have been a human-powered unit that could purify enough water for drinking.

Four mechanical engineering students, Randy Powell, Juan Delgado, Ken Ruble and Richard Tijan, all juniors, were joined by Diana Gonzales, a sophomore in civil engineering technology. The design incorporated pure friction on a device that appears similar to a stationary bicycle. As a person pedals, a shaft rotates a disk on the bottom of a container that holds water, creating friction. When the water boils, creating vapor, it moves into a condenser that turns it back into liquid, leaving behind any contaminants.

The four male team members pedal the device for the one-hour period allotted at the competition to produce 161 ml of distilled water. Team member Ken Ruble hopes to increase the output to 200 ml for the international competition this November in Seattle, Wash.

“We hope to improve the efficiency,” he said. A physical conditioning program for the team members, especially myself, should also help considerably,” Ruble said.

Engineering student is NMSU Valdıcıtor

Michelle Teresa Estrada-Lopez received the 1999 Award as valedictorian of the New Mexico State University spring 2007 graduating class.

The program gives undergraduate students a chance to propose, design, fabricate, fly and evaluate a reduced-gravity experiment. The experiment is intended to enhance the productivity of space exploration missions, which often are limited by a lack of resources. During a long mission, resources may need to be re-used, and a reduced-gravity mission may be needed to separate mixtures produced in various processes. On Earth, separation would be one way to separate the chemicals in the mixture. However, distillation relies on gravity and cannot be used in space. The team determined whether it is possible to use centrifugal motion and flash distillation to separate chemical mixtures in zero-gravity.

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The team took part at the Johnson Space Center in Houston. The team spent 10 days at the Space Center, where they attended safety training and finalized experiment construction before their flight.

Concrete Canoe team takes sixth place in national competition

The concrete canoe team at New Mexico State University swept the competition at this year’s National Concrete Canoe Competition, which took place June 14-16 in Seattle, Wash.

The concrete canoe team at New Mexico State University entered the competition after winning “human-powered water distiller” and will go on to an international competition in November 2007.

The team took first in all five racing events at the National Concrete Canoe Competition, which took place June 14-16 in Seattle, Wash. The canoe, named “For Pete’s Sake” after the school mascot, is 19 and-a-half feet long and pure white. The weight is extremely lightweight this year, contributing to their victory at the regional competition. “They wanted it bad,” he said.

A physical conditioning program for the team members, especially myself, should also help considerably,” Ruble said.

Concrete canoe is designed for human-powered water distiller

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The College of Engineering received a $25,000 grant from Northrop Grumman that could have a significant impact on national security,” said Garcia. "The associate professor and director of Northrop Grumman’s Integrated Systems sector, a national leader in UAVs, provided the grant as part of its ongoing effort to identify and capitalize on innovations and emerging technologies that can increase the efficiency of unmanned aerial vehicles (UAVs)." Northrop Grumman funds NMSU research design project

Northrop Grumman’s goal for providing this grant is to encourage research in the field of UAVs, with a particular emphasis on flight testing of technologies on UAV platforms within the protected airspace of NMSU’s Physical Science Laboratory,” said Carl Johnson, vice president and president for Northrop Grumman International Inc. Johnson is also a member of the Dean’s Advisory Council.

"Gifts like this really help us bring courses and experience to our students that we might not otherwise be able to offer," said Stephen Harris, dean of the NMSU College of Engineering, Intel Corp. provided $18,000 for scholarships, for middle-school students challenging them to build a remote-controlled robot that accomplishes a defined task within a competitive setting.

Intel gives $117K to engineering

Longtime supporters of the College of Engineering, Intel Corp. and the Intel Foundation, gave $17,000 to the college to support its K-12 programs, scholarships, and a guided design project for the chemical engineering laboratory. Intel donated $50,000 to support the pre-Freshman Engineering at RioRoboLab (PREP) project. PREP is an intensive mathematics-based pre-college summer program that provides educational enrichment for achieving middle- and high-school students. More than 90 percent of the students who participate in PREP go on to pursue higher education.

Another annual program benefiting from a $24,000 Intel donation was BEST, a competition for high-school students interested in engineering plants.
Jerry received a bachelor's degree in 1971 and a master's degree in 1974, both in chemical engineering. Following his retirement from El Paso Natural Gas Co., he has volunteered his time to the College of Engineering where he serves as president of the Chemical Engineering Academy and on the Deans Advisory Council.

D. Bruce Wilson Endowment

The family of Professor Emeritus D. Bruce Wilson and the department of chemical engineering have established an endowed scholarship in memory of Wilson through a gift of property in Taos, N.M. The endowment will provide for a graduate research assistantship.

Richard Bell Memorial Scholarship

Dolphy Laboratories and friends and co-workers of Richard Bell have made a gift of $10,000 to establish a scholarship in memory of him. It will support an undergraduate student majoring in electrical or computer engineering.

Jerry and Sandra Strange Scholarship

Jerry received a bachelor's degree in 1971 and a master's degree in 1974, both in chemical engineering. Following his retirement from El Paso Natural Gas Co., he has volunteered his time to the College of Engineering where he serves as president of the Chemical Engineering Academy and on the Deans Advisory Council.

College Support

New scholarships honor former students and faculty

Richard Bell received his bachelor of science in electrical engineering from NMSU in 1965. He was a pioneer in the development and production of communications systems ranging from stereo to massed campus traffic. Bell served as vice president of engineering and vice president of operations at Dolphy Laboratories.

Jerry and Sandra Strange made a $10,000 gift to establish an endowed scholarship in the chemical engineering department to be awarded to a chemical engineering student, preferably a returning or transfer student who is a junior or sophomore. The scholarship is named the Jerry and Sandra Strange Scholarship to honor the first industrial engineering degree program. The wind tunnel will be used for teaching and research in the state's only aerospace engineering degree program.

General Motors supports various engineering programs

Over the years General Motors has generously supported the College of Engineering and the past fiscal year was a continuation of this support. The college received $6,700,000 to be used in several ways. A portion of GM's gift supports recruiting and retention efforts conducted by the college of engineering. GM also supports the Engineering an endowed scholarship in honor of Richard Bell have made a gift of $10,000 to establish a scholarship in memory of him. It will support an undergraduate student majoring in electrical or computer engineering.

Jerry and Sandra Strange Endowment

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Dr. Milan Cobble and Dr. George Mulholland Mechanical Engineering Scholarship

Colonel Robert Wikle and his wife Dorothy established an endowed scholarship in honor of two professors who made a tremendous impact on Wikle during his academic career. The scholarship honors Milan Cobble, who taught from 1962 to 1966 and George Mulholland, who taught from 1966 to 1996.

Wikle received his master of science degree in mechanical engineering in 1970. He is active in the mechanical engineering department in the aerospace program.

1969 Industrial Engineering Scholarship

Philip Bills recently created the 1969 Industrial Engineering Scholarship to honor the first industrial engineering class at NMSU, of which he is a member. He established the endowed scholarship with a $5,000 gift. In addition to the new industrial engineering scholarship, Bills has funded the Bills Family Scholarship, for general NMSU awarding.

Econox Mobil

Exxon Mobil Corp. made a gift of $14,500 to provide scholarships and minority student programs in mechanical, chemical and civil engineering. A portion of the gift will support a Society of Hispanic Professional Engineers (SHPE) conference. A total of $15,000 was set aside to support senior-level project courses that prepare students for their pursuit of engineering in college through the Pre-Freshmen Engineering Program (PREP). Boosting Engineering Science and Technology (BEST) and the Regional Alliance for Science, Engineering and Mathematics Students with Disabilities (BASEM) Summer Program. The BASEM program provides hands-on engineering activities to students with disabilities so they can learn more about science, engineering and math.

The largest portion of GM's gift, $38,400, provided 12 scholarships to existing engineering students. Other support was earmarked for student activities such as the Society of Women Engineers Student Chapter and a sponsorship for students to attend the Society of Hispanic Professional Engineers (SHPE) conference. A total of $15,000 was set aside to support senior-level project courses that prepare students for their pursuit of engineering in college through the Pre-Freshmen Engineering Program (PREP). Boosting Engineering Science and Technology (BEST) and the Regional Alliance for Science, Engineering and Mathematics Students with Disabilities (BASEM) Summer Program. The BASEM program provides hands-on engineering activities to students with disabilities so they can learn more about science, engineering and math.

Completion of wind tunnel project celebrated

Students in NMSU’s new aerospace engineering program can explore aerodynamics in the newly improved and refurbished Subsonic Aerospace Wind Tunnel.

State funding enabled the renovation of the building, upgrades to the tunnel and new instrumentation for flow measurement, as well as the development and upgrading of other aerospace laboratories in the department of mechanical engineering. The wind tunnel will be used for teaching and research in the state’s only aerospace engineering degree program.

“This will now be a research-quality wind tunnel. We will be able to control the flow much better and to make precise measurements of flow velocities,” said Tom Buehler, mechanical engineering department head. “The renovated wind tunnel will be used for laboratory instruction and flow experimentation by the aerospace community in New Mexico.”

NMSU’s aerospace engineering program was launched in fall 2006. The freshman class has 25 aerospace engineering majors, and the college has identified several hundred New Mexico high school students who have space engineering among their top choices as a potential college major. With the bachelor’s level program in place, plans call for master’s and doctoral programs to be added in the future.

The Southern Tech Development Institute (STDI) was awarded a $2.2 million, five-year contract to conduct research aiding the U.S. Department of Energy’s (DOE) new Solar America Initiative. U.S. Sen. Jeff Bingaman, D-N.M., chairman of the Senate Energy and Natural Resources Committee, named STDI for a briefing.

The mission of the Solar America Initiative is to accelerate widespread commercialization of clean solar energy technologies by 2015 to give the U.S. additional electricity supply options while reducing greenhouse gas emissions on land and improving the environment. In a competitive process, DOE selected STDI, part of the College of Engineering’s Institute for Energy and the Environment, and its partners to lead a new Solar National Center for Energy and Natural Resources Committee, are working on legislation that would provide more funding for developing renewable energy technologies.

Significant Grants and Partnerships

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NMSU environmental program receives endowment

WERC: A Consortium for Environmental Education and Technology Development is the beneficiary of a $4 million endowment from the U.S. Department of Energy (DOE). The endowment, which was announced in February by U.S. Sen. Pete Domenici, R-N.M., will provide ongoing support to the program. The WERC consortium was established through Domenici’s efforts in 1990 and has received annual funding from the DOE to develop environmental expertise in the work-force and identify new and cost-effective technologies to address environmental and human health-related issues. The program encompasses education programs, public outreach and technology development and deployment. Among its priorities are pollution prevention, energy and environmental sustainability, water conservation, nuclear waste management, biomedical waste management and food contamination safety.

“I am proud of the accomplishments over the last 17 years,” said Domenici. “The program has done a good job educating students and teachers about environmental, human health, and energy issues. There is no doubt that we will need to rely on future generations for solutions to these tough problems.”

NMSU and General Electric Co. entered into a memorandum of understanding for the creation of a water technology research collaboration to find solutions to problems related to the quality, availability and affordability of water supplies.

Abbas Ghassemi, director of the Institute for Energy and the Environment, said a major focus of the joint initiative would be new technologies for treating saline and brackish water, which represents a large source of untapped groundwater in New Mexico and in many other parts of the world.

“The NMSU-GE initiative would tackle some of the toughest technical challenges of desalination, such as developing oxidation-resistant reverse-osmosis membranes that are not prone to fouling in brackish water, reducing the liquid discharge from desalination operations and developing more effective technologies for disposing of the discharge. Researchers would also pursue new ways of providing integrated power and water systems for small communities, using renewable energy sources such as solar and wind power, run water treatment facilities, Ghassemi said.

“Through innovation, research and hard work, the partnership will examine how to best tackle water quality and water scarcity issues that affect many communities and businesses in New Mexico and throughout the globe,” said Jeff Garwood, president and CEO of GE Water and Process Technologies.

Expanded research collaborations between NMSU and Sandia National Laboratories will focus on important national objectives and will solidify the hand-in-hand relationship with the signing of a Memorandum of Understanding (MOU) in Dec. 2006. The MOU will provide for expanded research interaction and collaboration, leveraging the technical expertise and laboratory facilities of both institutions and strengthening employment opportunities for NMSU students upon graduation.

Specific areas of collaboration include:

• Investigation of technologies and methods to improve power, energy and water reliability and security.
• Development of optical-based detectors.
• Creation of new antenna technologies.
• Development of microelectromechanical systems.
• Improving the design of nuclear and warhead weapons.

“This agreement is another example of Sandia’s commitment to working with various colleges and universities throughout the nation and the country,” said Robert D. Rottler, Sandia vice president of Weapon Engineering and Product Realization and chief engineer for nuclear weapon systems.
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