From the Editor
The Nebraska Blueprint prepares to strike out on its own.

Students uncover the secrets of the Magic Kingdom
Learning Community goes behind the scenes of this popular theme park.

Student Life on the Sixth Floor
Freshmen get a little help from their peers.

Celebrating National Engineers Week at PKI
First time at PKI is a charm.

NSBE lights its torch at UNL
Students pull together to bring chapter back to the college.

Undergraduates benefit from conducting research
Students find special projects enhance college experience.

Postcard from Paris
Ag students learn a little from French counterparts.

Out of the starting blocks
First ArchE grads share thoughts on program.

Back Page
The Nebraska Blueprint is produced by students for the University of Nebraska College of Engineering and Technology and is published twice each year. Reprint permission granted if requested prior to publication. Reprint requests and reader contributions in the form of letters, articles, photography or original artwork should be addressed to Nebraska Blueprint, 114 Othmer Hall, Nebraska 68588-0642; telephone 402-472-8318; fax 402-472-7792. The University of Nebraska does not discriminate in its academic programs.
From the Editor

It’s been a year of change. Our country has a new president. Our university has a new chancellor. The chemical engineers are getting a new building. And, starting this fall, the Nebraska Blueprint will no longer be published as part of Contacts.

This is not an entirely new situation. The Nebraska Blueprint began as an independent magazine from the early 1900s through 1992 when it merged with Contacts because of cost considerations. When the decision was first made to merge the two publications, Morris Schneider—then acting dean of the College of Engineering and Technology—said he hoped the magazines would be able to separate again in the future. “There is a long, proud history behind the Nebraska Blueprint and I know scores of alumni are interested in the publications,” he said in the Summer 1992 issue of Contacts.

That time is now.

Since the merger, fewer and fewer students have participated in the production of the publication, which at one time had more than 20 staff members. Recently we realized that we lost our target audience—us. The separation is one way to reach out to the student body and increase student involvement. Because we know how much our publication means to so many alumni, excerpts of student news will run in a special section of every Contacts magazine. The Nebraska Blueprint also will run excerpts from the Contacts in our magazine to keep students up to date on alumni. We will continue to publish twice a year.

And because we know that budget concerns will never disappear we are working on a proposal for underwriters for each issue. We are also asking for subscriptions to our publication for $10 a year. Both will offset the cost of printing and distribution. As always, we hope to hear from you. Send your comments and story ideas to:

Nebraska Blueprint Editor  
College of Engineering & Technology  
W181 Nebraska Hall  
Lincoln, NE 68588-0501

See you in the fall.

— Rebecca Oltman
Most visitors to Disney World see only what its creators want them to see. But in January, several aspiring engineers, members of the College of Engineering and Technology Freshman Learning Community, got to peek behind the scenes of one of the world’s most visited attractions. They were impressed, surprised and inspired. Some even had life-changing experiences. But all agreed it was a trip worth taking. The students shared their comments with their sponsor and the Nebraska Blueprint.

“I always thought of Walt Disney World as ‘just another theme park for kids,’ but I found out that a lot of thought went into that place ... I am so excited I was able to see firsthand how this all happens.” — Jessica Kissner

“I was impressed by the care the company has taken in trying to minimize the overall effects the park may have on the environment and surrounding areas.”

—Ian Steins

“The sheer immensity of the park and industrial engineering to accommodate 60,000 employees was amazing.”

—Jonathan Naber

Students learned quickly while in Disney World that things aren’t always as they seem. For example, that luscious cookie smell that wafts throughout the park tempting visitors into the cookie shop? Well, there’s a reason it’s called the Magic Kingdom.

“The guide said you could wash more clothes in an hour there than you could at home if you left your washing machine running for 43 straight days. That’s impressive.” — Chris Eymann

Imagine the water bill. And just how do those Disney characters get from one end of the park to the other without being spotted where they aren’t supposed to be? To find out, one must take the Utilidor.

“The Utilidor runs beneath the Magic Kingdom and houses most, if not all, the ductwork. It also serves as a corridor through which Disney cast members move from one part of the park to another. I’d never realized that you don’t see anyone in costume for, say, Future Land, anywhere except in Future Land.” — Mike Tittel.
"The cookie smell was piped in through a tube. I stood with my mouth open for a moment trying to regain a sense of reality. Could it be true that such a wonderful smell, one everyone knows and loves, could be piped in? But it was true; the cookie smell was a ruse ... my life was changed. I realized that when you are in Disney World ... everything is controlled behind the scenes." — Emily Schmatz

Surely, the castle is real? Yes ... and no. During their Innovation Tour, students found that Disney World takes a very different slant on reality.

"Cinderella’s Castle looks so huge ... because it was constructed on the ‘third floor’ from ground level. The rest of the park is on the second story so the castle looks bigger. Also, they slant the building fronts on Main Street so it looks longer than it actually is. This makes the castle appear more distant ... and the exit appears closer as you leave the Magic Kingdom." — Mike Tittel

There are more than 60,000 people working in the park — about one-third the population of Lincoln. That’s a lot of laundry. But Disney World, in all its engineering wonder, figured out how to do it with style.

"The laundry facility is almost like an assembly line. Automated machines take the laundry to the different areas of the facility. They bring the dirty laundry to the washers, then the dryers and finally to the folding machines." — Shaun Maloney

As long as you’re in Florida, you might as well take in the Kennedy Space Center. That’s exactly what students did on their last day.

"At the Kennedy Space Center, I was able to see the history of the space race first hand. Also, information about specific aspects of aeronautical physics, such as rocket propulsion and re-entry, was a memorable part of the tour.” — Jeremy A. Tidemann

"It helped express to us how far technology has come and how far it can go in the future.” — Greg Sullivan

So, just how beneficial was this trip? Comments from most students read as follows: “Interesting.” “Enlightening.” “Educational.” “Fun.”

But perhaps it is best summed up by Mike Gerdes.

"Obviously, anything that allows me to fly down to Florida during January is a good thing. But I found that the things I learned and the experiences I gained proved to be even more valuable than relief from a cold Nebraska winter.”

--Constance Walter
Student Life on the Sixth Floor: Freshmen find common ground in the Learning Community

by Adam Holmberg

For years, aspiring engineers living on the sixth floor of Abel Residence Hall have formed a tight-knit social and academic community. There, students found a common ground on which to confront their first battles with life in college.

The University of Nebraska—Lincoln recognized the benefits to freshmen and three years ago created several Residential University Learning Communities, making the long-standing tradition in the College of Engineering & Technology official. The Engineering and Technology Learning Community serves up to 80 freshmen each year. Students find the community helps ease them into the engineering curriculum and provides a strong support structure.

“They feel like they have people around them who understand,” said Ann Koopmann, Coordinator of Student Programs and the College of Engineering and Technology liaison to the learning community. “They know the guy or girl next door is studying for the same test.”

The learning community also offers students opportunities they may not have otherwise. Through the program, community residents are enrolled in the same sections of certain core classes, such as chemistry and calculus, and attend an exclusive section of Freshman Engineering Seminar.

Outside the classroom, students get a firsthand look at real-life engineering through industry visits. The Learning Community has gone to Black & Veatch (an engineering and construction consulting company in Kansas City); visited the First National Tower being built by Kiewit Construction in Omaha; and took a three-day excursion to Florida. At Disney World, the group was treated to a behind-the-scenes “Innovation in Action” tour. The students learned things about physics, machinery and the environmental concerns of a project of such magnitude that was built on the swamp. In addition, they saw things ranging from extensive laundry systems and parade preparation to the process used to pump cookie smells into the park. On the third day, they toured Kennedy Space Center, then flew home.

For some, the trip was their first ride on a plane. For others, it marked the first trip to Disney World. For
“This has been an excellent tool in helping students stay on track throughout their college career,” Koopmann said.

Two other perks: Students get to know faculty and the associate dean through special lunches and dinners and there’s the ever-popular annual steak and egg dinner.

everyone, it was an educational adventure filled with glimpses into the real world and new realizations about solving engineering problems.

The trip was very much in keeping with the goals of the learning community.

“Our goal is to connect what students are doing in the classroom with life outside of the classroom,” Koopmann said. “You don’t immediately connect engineering with Disney World, but through this trip, students discovered the many possibilities engineering offers.”
Celebrating National Engineers' Week at PKI

Photos and story by Tonia Kinish

E-Week was a smashing success pulled together by the dedication and hard work of engineering and technology students promoting their fields of interest.

From Feb. 18-24, students set up tables with information, displays, raffles and, of course, lots of candy to lure visitors. There also were sign-up sheets for tours, professional shadowing opportunities and memberships into student organizations.

High school students shadowed the Celebrating National Engineers’ Week at PKI Diplomats, who took the students to class with them and gave them tours of the building, and met with faculty.

There were five participating groups: American Society of Heating Refrigeration and Air-conditioning Engineers (ASHRAE), Architectural Engineering (AE), Society of Manufacturing Engineers (SME), Institute of Electrical and Electronics Engineers (IEEE) and American Society of Civil Engineers (ASCE).

Sophomores Jairus Gonzales and Jessica Rock tend to the Architectural Engineering table. This group had a lighting display and a computer model of how contaminated air travels in a room. They also had sound pressure meters to measure acoustics in the PKI building and a transparent model of a circuit breaker. HDR, DLR and The Schemmer Associates provided giveaways of pens, pads of paper, scales and stress balls (something we all need now and then).

SME displayed different objects used in manufacturing, including an aluminum Maverick football made by abrasive waterjet cutting. Two versions of a lever for a Toro lawnmower were displayed: a rapid prototype made of glass-filled Duraform and a metal part formed by a stamping process. Also displayed were two chess pieces made on a CNC machining center.
IEEE showed off a circuit board and computer chips. They also had information on electronic circuits and the financial aspects of the business.

Dana Svendsen, civil engineering senior and ASCE student chapter president, answers questions about ASCE and the civil engineering department.
NSBE lights its torch at UNL
by Deepak R. Keshwani

A burning desire to help minorities achieve success and effect positive change in society are just two goals of the National Society of Black Engineers. According to the mission statement of the national society, NSBE has more than 10,000 members nationwide and is one of the largest student-managed organizations in the country. Its mission is “to increase the number of culturally responsible black engineers who excel academically, succeed professionally and positively impact the community.” That symbolic torch is now burning at the University of Nebraska–Lincoln.

The chapter currently has 12 members and has been recognized by the national organization. Although progress has been slow this past year, “a strong foundation has been established and the time taken was worth it,” Williams said. “The chapter shouldn’t cease to exist when some of us graduate.”

The chapter has been meeting on a weekly basis and preparing for the national convention in March. Williams hopes he and his fellow members will obtain valuable information about NSBE’s programs and initiatives, including the Pre-College Initiative, which Williams wants to implement next year.

He also believes the chapter will be an effective support system for minorities. “We preach academic excellence and getting involved in study groups,” he said. “We don’t have a GPA requirement. We want students to know there is ample amount of help available. They don’t have to struggle.”

Adams and Williams said they have had a lot of support from the college in starting up the chapter. “Dr. Ballard, Ann Koopmann and Dr. Boye have encouraged us and contributed a lot toward this chapter,” Williams said.

Despite representing a small section of the NU engineering community, NSBE is setting an example through its efforts to enhance diversity in the college.

“NSBE is a great organization and its
UNL’s chapter. Some of her expectations include helping the College of Engineering & Technology in recruiting African-American students and supporting students in academic and career-based pursuits. Benefits are excellent if you give it a chance,” Adams said.
Several years ago I began doing research at the College of Engineering and Technology here at Nebraska. Since then I’ve come to realize the extent to which undergraduates are involved with graduate-level research. The breadth of the topics is inspiring and the number of students participating in the research is surprising.

All departments within the college have undergraduates performing research. Although some departments have more students involved than others, overall there are about six participants within each department. I’ve had the opportunity to track down some of these students and get some feedback on their research interests as well as their impressions of the work itself.

These motivated individuals had only good things to say about participation in these endeavors. The individual students got involved with the projects for many different reasons. Some began work on their projects for pay, but ultimately continued the work because of their interest in the area. Brent Petersen, a senior mechanical engineering student who works with stratified thermal storage water systems, is one of these students.

Ryan Huff is a senior civil engineering student working on speed prediction for horizontal curves on two-way, two-lane rural highways in Nebraska. Huff commented on the benefits of conducting the research. “It not only helped me apply my class-room learning, but it taught me many new things not taught in the classroom,” he said.

Kratochvil added, “I think that learning without application isn’t very valuable to your college education.”

With these kind of responses, it’s not surprising that every student I talked with would encourage their peers to participate in some sort of research.

“I have learned so much doing the research. I’m now more aware of different issues when I go to my classes,” McCabe-Stephens said.

Nick Burns, a biological systems engineering graduate, completed his honors thesis in the fall of 2000 on the dual removal of perchlorate and nitrate from groundwater.
“I started doing the research for pay; however, this semester I’m doing a project for class credit not counting toward my degree, and mainly for personal interest,” said Petersen.

Brad Kratochvil and Jed Pedersen, senior computer engineering students, are working with a robotics company to port software drivers for robotic controller boards with Windows CE. This project stemmed from Kratochvil’s personal interests in robotic applications. They intend for the robots to be used in such research areas as machine learning and artificial intelligence.

Some of the undergraduates sought out professors for research work while faculty approached others. Anne McCabe-Stephens, a senior civil engineering student, began her work after a professor asked her class for help with research projects. She is working on a dry weather storm sewer flow study for the City of Lincoln.

Most undergraduates participate in research for several semesters. Some may only work a semester or two, while others work on different projects over the course of several years. Students work on the projects anywhere from 10-20 hours per week depending on deadlines and course load, with optional additional employment during the summer.

through biological reduction. “For me, it was a huge benefit and really put me a step ahead in the job market,” said Burns. “It also tied my coursework in well with my interests and allowed me to explore other topics that were not covered by university coursework.”

With these students participating in such exciting research and enjoying it so much, one would think they would be excellent candidates for graduate school. The students interviewed for this article said they would like to continue their education and research endeavors.

“It would be a loss not to try something while you are still in school and later find out you may have liked it,” Petersen said. “If someone is even thinking about going to graduate school, I would highly recommend doing undergraduate research.”

Doing research beyond a senior design project allows students to really begin to think and put all the parts of their education together. Since I’ve been here at UNL I’ve done several research projects with different faculty members in a couple of departments. I’m currently working on my honors thesis, which is composed of designing, building and testing several highway construction barrel robots.

I’m very thankful to have the opportunity to be involved in the research and I hope that future students take advantage of these opportunities to learn and grow. The advantage, regardless of whether you’re going immediately into industry or onto further schooling, is enormous.
Postcard from Paris

by Ginger Wingate

It was a week of “firsts” for me — just traveling outside of the United States was big. But I was going to Paris.

I was part of a group of several students and two professors, Dr. Leonard Bashford and Dr. Curtis Weller (and their wives) from the University of Nebraska–Lincoln. We were going to Paris for two agriculture shows. Our majors included agricultural engineering, mechanized systems management, food processing and biological systems engineering. The focus for AE and MS Management students was to compare U.S. and European production, machinery and farm animals. Those in BSE and food processing focused on the differences between European (France in particular) and U.S. ideas on processes and practices of food growth and the environment. My area is organic farming and its effects on society and the environment.

We arrived in Paris on a Sunday morning and went to our hotel in the Bastille area. After that, we toured the city. With our metro and bus passes in hand, a group of us chose the Eiffel Tower as a first stop. I had to pinch myself — I was really in Paris looking at the Eiffel Tower. We walked down the Champs d’Elysees then to the Louvre, where the Mona Lisa and Venus de Milo, among many other famous art pieces, are on view.

On Monday we went to SIMA, which focused on farm machinery and

On Tuesday we went to SIA, where we saw everything from cows to champagne, to the most unique types of sausage and other meats to flowers from Africa. Before the day was over, we had tasted a variety of wines and champagnes, cheeses and ice creams. But we weren’t there just for the food, we were doing homework. I found numerous booths with information on organic farming, a booming industry in France. Later, we went to a soup kitchen where we were served by surly waiters.

Before the week was over, we had walked many miles and seen many wonderful things: Notre Dame, the catacombs, the Pantheon, the Chateau Versailles, authentic French restaurants and so much more. A group of us even took a trip to Dijon to visit two universities that have laboratories for food science and processing. The educational system is very different from that in the United States. At Ensbana University, Philippe Cayot gave us a tour of his labs. After our tour we ate and then went to a vineyard, Chateau de Marsannay Cote d’Or, where we saw firsthand the machinery and tools used in making wine and learned about different wines.
mechanical components. Some said it was like Husker Harvest Days — multiplied by 10. There were several large buildings filled with vendors and companies. This show was enormous. We saw only a portion of it, but there were many familiar companies present: John Deere, Case and New Holland. Even Iowa State University was there.

Although we saw many wonderful sights in Paris — and I could have stayed longer, I did miss Nebraska’s wide open spaces and clean air. It’s good to be back.

Those participating in the trip were: Leonard and Karen Bashford, Curtis and Nancy Weller, Alejandro Amezquina, Maria Cacho, Macqueline Anderson, Kate Sackett, Matthew Cox, Doug Lancaster, Billy Cutsor, Charles McFarlane, Curtis Dowding, Eric Jacobs, Scott Eisenmenger, Aaron Franzen, Ivan Leaders, Corry Minnick, Kourtney Mueller, Ginger Wingate, Natalie Souder, Wendy Wielechowski, Brian Thomas, Damon Thomas, Scott Wellensiek and Andrew Wellensiek.
May 2001 marks the beginning of a profitable and fulfilling career in architectural engineering for the first graduates of the new Architectural Engineering program on the Omaha campus. Nate Redmann, David Yuill, Stephen Farrington and Brad Carne will graduate in May, and Melissa Jones will graduate in December. We talked to four of these students to find out what they think about the program and their upcoming graduation.

**Blueprint:** How do you feel about being a pioneer in the AE program?

**Stephen:** It is a good feeling to know that I am a part of a program that is going to be a strong force in the field of architectural engineering.

**Nate:** I hope I have laid out a path for others to follow. Not only do I consider myself a pioneer, but also I hope I am a trendsetter and that my actions in the future will strengthen the perception of this program.

**BP:** How much input or influence did you have on the curriculum?

**Melissa:** They asked our opinion, but I don’t think we had the final say in it. They tried stuff out on us and then asked us how it went. We probably had some influence, but I think the professors learn from every class of students they have, not just the first ones.

**Nate:** We did not directly affect the curriculum; however, we did break in all of the professors, which will make it easier on fellow students.

**BP:** Do you foresee a problem in the job market with respect to the program not being accredited?

**Stephen:** Most employers realize that the program will be accredited so that has not been a problem yet.

**Nate:** The AE community is starving for qualified people at this time. If they can fill a seat with a knowledgeable person, they will, no matter what the status of their degree.

**BP:** What do you think of the building?

**Stephen:** The PKI building is great. Having a new facility with all the technology can only increase the desire for incoming students to want to be a part of the AE program.

**David:** I like it. It has been used in several of my classes as a demonstration device.

**Melissa:** They asked our opinion, but I don’t think we had the final say in it. They tried stuff out on us and then asked us how it went. We probably had some influence, but I think the professors learn from every class of students they have, not just the first ones.

**Nate:** We did not directly affect the curriculum; however, we did break in all of the professors, which will make it easier on fellow students.

**BP:** What do you think of the program?

**Nate:** Architectural engineering is a unique career choice. It has allowed me to gain knowledge of all aspects of buildings (architectural, structural, mechanical, acoustical...
and electrical).

David: I was initially attracted to AE by the job prospects for graduates. I was attracted to this program by the cheaper tuition (I started AE at Penn State University) and by the belief that this program would give me as good a learning experience as any.

Also, it provides a homey atmosphere having all of the people in engineering in one concentrated area.

BP: What do you think of the faculty?

Melissa: They are all really supportive and involved with us. They want us to do well and will do what it takes to help us, not just in class, but with our careers as well.

Stephen: They are always very helpful and knowledgeable. Sometimes it would be nice to have more faculty who have worked in the field because having that perspective is always useful. But I can’t take anything away from the faculty we have now; they do a wonderful job.

After graduation I intend to fully pursue my options and explore every opportunity put in front of me.

BP: Do you have any advice for new AE students?

Nate: Work hard and make friends in the engineering community. It is not only what you know, but who you know.

Stephen: Get an internship as soon as possible. That will teach you more about the way this field operates than anything else. It shows you why you are learning the material in school and how to apply it in the job force.
Discovering the Fundamentals

The College of Engineering & Technology hosted Discover Engineering Day on Feb. 23. The event, geared toward fifth-through eighth-graders, focused on the basics of engineering. Nearly 300 students attended from across the state. Participating schools were Dawes Middle School, Lincoln; Elmwood Murdock, Murdock; and Barr, Walnut and Westridge middle schools, Grand Island.

“This is a new event and one we are really proud of,” Ann Koopmann, coordinator of student programs for the college. “We felt there was a real need to reach students at an early age and to introduce them to engineering as a possible future career.” Activities included designing and building Popsicle stick bridges, an aluminum foil boat, balloon rockets and a magnetic fishing pole.

We wanted the students to have fun while learning about engineering,” said Luke VanCamp, a senior in mechanical engineering and a coordinator of the event. “We wanted to create interest in engineering.” Discover Engineering was co-sponsored by Pella Windows, Energizer and Commonwealth Electric. It took place at Cook Pavillion.

No Man is an Island

Assistant Professor David Admiraal and civil engineering student Corey Haberman are surrounded by the waters of Lake Ogallala. Engineers have constructed this physical water circulation model in the Hydraulics Laboratory to study circulation patterns in Lake Ogallala. Look for a story on this project in our Fall 2001 issue.