

News Service

[News Service home](#)

[Video](#)

[Contact us](#)

[News archives](#)

 [RSS news](#)

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[News releases](#)

[Download mug shots](#)

[Other news sources](#)

[Campus maps](#)

For the campus

[Faculty, staff announcements](#)

[Student announcements](#)

[Arts & entertainment](#)

[Research news](#)

[Sports news](#)

[Inside Iowa State](#)

[Iowa State Daily](#)

[Time of day](#)

[Weather reports](#)

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Iowa State and DMACC work together to increase engineering graduates

AMES, Iowa -- Iowa State University and Des Moines Area Community College will work together to boost the number of students earning engineering degrees.

An enrollment boost would be good for the schools and the country.

A 2005 study by a National Academies committee ("Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future") said the country must find a way to produce more scientists and engineers.

"The committee is deeply concerned that the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength," the study said. "Although many people assume that the United States will always be a world leader in science and technology, this may not continue to be the case inasmuch as great minds and ideas exist around the world."

A five-year, \$2 million grant from the National Science Foundation will help Iowa State and Des Moines Area Community College (DMACC) do their part to encourage students to study science, technology, engineering and mathematics through a Student Enrollment and Engagement through Connections program. The grant sends \$1.5 million to Iowa State and \$500,000 to DMACC.

Community colleges are a good place to reach students who might have an interest in science and technology, said Frankie Santos Laanan, the co-director of Iowa State's Office of Community College Research and Policy and an associate professor of educational leadership and policy studies.

Laanan said a National Science Foundation report found that 40 percent of all students who graduated in 1999-2000 with bachelors' or master's degrees in engineering had attended a community college. He said 22 percent of those same engineering graduates had an associate's degree.

"This National Science Foundation program will make a bold statement that students who choose not to start at Iowa State from high school can begin a pre-engineering curriculum at Des Moines Area Community College," he said. "This really ensures student success, transfer and, ultimately, the completion of an engineering degree."

Diane Rover, an associate dean in the College of Engineering and



Quick look

Iowa State University and Des Moines Area Community College will work together to attract more students to engineering. At Iowa State, the goal is 120 more students earning bachelor's degrees in engineering. At Des Moines Area Community College, the goal is more students studying science and technology. That's expected to increase the number of students transferring to Iowa State's College of Engineering.

Quote

"This National Science Foundation program is a tremendous opportunity for Iowa State University. It will help Iowa State meet the national goal of recruiting and retaining new engineering students. And, it will help Iowa State reach its goals of strengthening undergraduate education, increasing experiential learning opportunities and partnering with community colleges to facilitate student success."

Elizabeth Hoffman, Iowa State's executive vice president and provost

"I think this is an excellent opportunity. This will enable us to build stronger bonds between the two institutions and help students make smooth transitions between them."

Harry McMaken, a professor of engineering and math at Des Moines Area Community

the leader of the research project at Iowa State, said the program's goal is to boost the number of Iowa State students earning a bachelor's degree in engineering by 120 per year beginning in 2012. The project also calls for women to account for 20 percent of Iowa State's undergraduate engineering graduates and minorities for 10 percent. (Iowa State's 2005 class of undergraduate engineering graduates included 15 percent women and 9 percent minorities.)

At DMACC, the project is expected to boost enrollment of students in science and technology. And that is expected to increase the number of transfers from the community college to Iowa State's College of Engineering.

To accomplish all those goals, Iowa State and DMACC will:

- enhance the engineering learning communities at Iowa State and make some programs available to community college students. DMACC will also create its own learning communities that complement Iowa State programs. Learning communities allow students with similar academic interests to take classes together and live in the same residence halls.
- redesign the first-year curriculum for engineering students and make some courses available to community college students via distance education technology. The new design would feature projects that show students the breadth of engineering work.
- develop and enhance advising and mentoring programs for pre-college, community college and university students.
- establish a recruiting and outreach network across the state with the help of alumni, Iowa State University Extension and DMACC. The network would help students, parents and teachers understand the benefits of an engineering education and career. Those benefits include employment opportunities with companies in Iowa and around the world. Engineers earn average starting salaries of \$54,200.
- evaluate the project and make improvements.
- share success stories and best practices with other universities and community colleges.

"This National Science Foundation program is a tremendous opportunity for Iowa State University," said Elizabeth Hoffman, Iowa State's executive vice president and provost. "It will help Iowa State meet the national goal of recruiting and retaining new engineering students. And, it will help Iowa State reach its goals of strengthening undergraduate education, increasing experiential learning opportunities and partnering with community colleges to facilitate student success."

Harry McMaken, a professor of engineering and math at DMACC's Ankeny campus and the leader of the research project at the community college, said the program will build relationships between his students and the students and programs at Iowa State. That will help the community college improve its offerings to students. And that will help the community college recruit students to science and engineering classes and keep them there.

"I think this is an excellent opportunity," McMaken said. "This will enable us to build stronger bonds between the two institutions and help students make smooth transitions between them."

Rover said the project's goal of increasing the number of Iowa State engineering graduates by 120 students will be a challenge. But she believes it's a realistic one.

"We want this to work," she said. "We want students to have educational and career opportunities made possible through engineering. We want parents, teachers and other mentors to encourage today's youth to study science and engineering and

College's Ankeny campus and the leader of the research project at the community college

The research team

These are the researchers working on the Student Enrollment and Engagement through Connections program at Iowa State University and Des Moines Area Community College:

Iowa State University

- Diane Rover, principal investigator, associate dean for academic and student affairs, College of Engineering
- Monica Bruning, co-principal investigator, program manager, engineering enrollment services and precollegiate programs
- Frankie Santos Laanan, co-principal investigator, associate professor, educational leadership and policy studies
- Steven Mickelson, co-principal investigator, associate professor, agricultural and biosystems engineering
- Mack Shelley, co-principal investigator, University Professor, educational leadership and policy studies

Senior personnel:

- Loren Zachary, assistant dean for engineering education, College of Engineering
- Karen Zunkel, program manager, Program for Women in Science and Engineering
- Nancy Knight, director of diversity and graduate student affairs, College of Engineering
- Mary Goodwin, program coordinator, engineering academic and student affairs
- Mani Mina, senior lecturer, electrical and computer engineering

Other collaborators:

- Robyn Johnson, program coordinator, Research

become tomorrow's leaders addressing energy, health and many other issues."

-30-

Institute for Studies in Education

- Mary Darrow, doctoral student, educational leadership and policy studies

Des Moines Area Community College

- Harry McMaken, principal investigator, professor, engineering and math

Senior personnel:

- Kim Linduska, executive vice president for academic affairs

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